



PRELIMINARY ASSESSMENT/ SITE INSPECTION ADDENDUM

OFF- POST PRIVATE WELL INVESTIGATION OF PER- AND POLYFLOUROALKYL SUBSTANCES

Yakima Training Center, Washington

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EXECUTIVE SUMMARY

The United States Army (Army) is performing Preliminary Assessments (PAs) and Site Inspections (SIs) to evaluate the current or potential historical use of per-and polyfluoroalkyl substances (PFAS) at Army installations nationwide. These efforts were completed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), National Oil and Hazardous Substances Pollution Contingency Plan, and Army/Department of Defense policy and guidance.

The SI sampling at Joint Base Lewis-McChord – Yakima Training Center, Washington (Yakima Training Center) detected concentrations of perfluorooctane sulfonate (PFOS) and/or perfluorooctanoic acid (PFOA) in groundwater on-post, where an evaluation of local groundwater flow identified possible impacts to off-post drinking water wells. To evaluate possible PFOS/PFOA impacts to off-post drinking water sources, the Army conducted off-post sampling at private drinking water wells that appeared to be hydrologically connected to groundwater beneath Yakima Training Center.

In total, 299 wells at 293 properties were sampled over the three mobilizations. The sampling identified sixty-two (62) wells (located at 61 properties, and serving 88 locations) exceeding the 2016 United States Environmental Protection Agency's (USEPA) Lifetime Health Advisory of 70 parts per trillion for PFOS/PFOA, individually or combined. The Army has initiated a response action to provide bottled water to the affected locations, and has initiated a CERCLA Remedial Investigation at Yakima Training Center to further delineate the nature and extent of the PFAS releases and to evaluate the risk posed to human health from the releases.

1 INTRODUCTION

The purpose of this Preliminary Assessment (PA)/Site Inspection (SI) Addendum is to document analytical results and findings in response to the separate investigation of perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) in off-post drinking water potentially associated with past United States Army (Army) operations at the Joint Base Lewis-McChord – Yakima Training Center (Yakima Training Center) in Yakima, Washington. This addendum, while documenting the separate off-post investigation, serves to supplement the PA/SI report prepared by Arcadis U.S., Inc. (Arcadis; Arcadis 2021).

The Army conducted a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) PA/SI to assess potential impacts from per- and polyfluoroalkyl substances (PFAS) at Yakima Training Center. Seven areas of potential interest (AOPIs) were identified during the PA/SI; six of the AOPIs are located in the southwest portion of the installation near the installation boundary. PFOS and PFOA are two chemicals included in the larger class of PFAS. Concentrations of PFOS and PFOA in groundwater on-post at or downgradient of AOPIs identified at Yakima Training Center exceeded the 70 parts per trillion (ppt) 2016 United States Environmental Protection Agency (USEPA) Lifetime Health Advisory for drinking water.

Due to the exceedances for PFOS and PFOA in groundwater at or downgradient of the AOPIs, the close proximity of the AOPIs to the installation boundary, and the potential for groundwater emanating from these AOPIs to affect downgradient off-post receptors, the Army identified the need for this off-post private well sampling.

In the cantonment area of Yakima Training Center (i.e., where six of the seven AOPIs are located), the uppermost groundwater occurs in shallow, perched zones in vesiculated fractured basalt. Depth to groundwater in the shallow unconfined aquifer can range from 10 to 100 feet below ground surface in the cantonment area, and the flow direction of the perched water is generally to the west and southwest off-post toward the Yakima River (**Figure 1**; Tetra Tech 2017, 2018). A highly productive regional basalt aquifer underlies the cantonment area at depth. Drinking water supply wells installed in this aquifer may have screen depths greater than 350 feet below ground surface, and artesian conditions are found at some wells screened in the deep confined aquifer. Groundwater in the basalt aquifers generally flows westward toward the Yakima River with a more northwesterly flow component closer to the river (Ecology and Environment, Inc. 1993, SAIC 1995). Public water supply wells and domestic supply wells off post are screened at various depths and may intake water from the shallow unconfined or deep confined aquifers.

To identify potable wells downgradient of the installation boundary near the AOPIs, an off-post well survey was completed for off-post drinking water wells using available information. Publicly available information (including well records obtained from the online Washington State well database, YTC personnel, and other historical documents completed for the installation) was

reviewed to identify potential private drinking water wells, including the county tax parcel record. Yakima County tax parcel records were also reviewed to identify wells of potential concern (and compile a list of property owners for the wells) that may not be included in the state database. Wells were identified for possible sampling as part of this effort based on the understanding of the relationship between on- and off-post hydrogeological conditions. Yakima Training Center personnel then sent questionnaires to parcel owners about any wells on the premises and asked for access permission to sample their wells. After review of the questionnaires and permission slips, off-post drinking water wells were sampled in the downgradient areas shown on **Figure 2**. The off-post drinking water sampling took place during September 2021, January 2022, and July/August 2022. A total of 301 primary off-post samples were collected at 299 wells (located at 293 properties), with associated quality control samples, as part of the off-post receptor evaluation. Locations of the individual wells sampled are not shown in this report to protect the privacy of the residential homeowners.

2 SAMPLING PLAN

Drinking water samples were collected in accordance with Army and USEPA guidance for PFAS in potable water. The off-post drinking water sampling took place over three mobilizations, based on preceding mobilizations' off-post sampling results. A total of 301 samples were collected from 299 wells at 293 locations were sampled over the mobilizations (two locations were sampled post-water softener during Phase II and resampled pre-water softener during Phase III, and six locations had two wells onsite that were both sampled), with associated quality control samples, in the areas shown on **Figure 2**. Quality assurance/quality control samples included 17 field duplicates, 17 matrix spike and matrix spike duplicates, and 17 field reagent blanks.

Unlined, high-density polyethylene bottles were used to sample unfiltered (if possible) outdoor spigots, wells, or hose bibs. Water was purged from the sampling collection point for approximately 3 minutes before collecting the samples. Purged water was discharged to the ground surface near the point of collection. New nitrile gloves were used for each individual sample collection. Once collected, the samples were properly labeled, placed in sealed Ziploc® bags, and preserved on ice to maintain a temperature between 0 and 4 degrees Celsius.

Pace South Carolina (formerly Shealy Environmental Services, Inc.) analyzed the samples collected during Phase I and II. Eurofins Lancaster Laboratories Environmental analyzed the sampled collected during Phase III. Both laboratories hold Department of Defense (DoD) Environmental Laboratory Accreditation Program certifications. PFAS analyses were conducted in accordance with United States Environmental Protection Agency (USEPA) drinking water Method 537.1.

3 DETECTIONS AND EXCEEDANCES

Of the 301 primary drinking water samples collected, 151 samples had detections of PFOS and 145 samples had detections of PFOA. In total, 155 had detections of either PFOS, PFOA or both, while 146 samples were non-detect for both PFOS and PFOA. Of the 151 samples with PFOS detections, concentrations ranged from 0.49 J (an estimated concentration) nanograms per liter (ng/L) to 1,500 ng/L. Of the 145 samples with PFOA detections, concentrations ranged from 0.62 J ng/L to 150 ng/L. Sixty-two (62) residential samples (collected from wells at 61 properties) had combined concentrations of PFOS and PFOA that exceeded 70 ppt (USEPA 2016). These 62 wells serve 88 locations. The other 93 samples with detections of PFOS and/or PFOA had combined concentrations less than 70 ppt.

All sampling results were provided to their respective well owners. Additionally, the USEPA, Washington State Department of Ecology, Washington Department of Health, Yakima County Health Department, and Yakama Nation were notified about the off-post sampling events and exceedance results. **Table 1** provides a summary of the PFOS and PFOA data results for all samples collected during both mobilizations. The full PFAS analytical results for samples collected during the off-post assessment are included in **Attachment 1**.

4 DATA VALIDATION

Each laboratory data package/sample delivery group underwent 100% review of Stage 3 data packages (i.e., for samples collected during Phase I and II) or Stage 2B data packages (i.e., for samples collected during Phase III) and 10% review of the raw Stage 4 data packages (for all samples) for validation in accordance with DoD Quality Systems Manual 5.3 (DoD and Department of Energy 2019). The results for drinking water samples collected were found to be acceptable and usable for evaluation against the screening criteria for PFOS and PFOA with the laboratory and validation qualifications documented in the data usability summary reports (**Attachment 2**); no results were rejected. Laboratory and validation qualifiers for data are shown in **Table 1** (and in **Attachment 1**) and are defined in the notes of the tables.

5 SUBSEQUENT ACTIONS

Following completion of the drinking water sampling and data receipt/validation, an alternate source of drinking water was provided to 88 locations where concentrations of PFOS and PFOA exceeded 70 ppt at the 62 sampled wells serving those locations. In addition, a Time Critical Removal Action (TCRA) Memorandum issued in 2023 documented the Army's decision to mitigate exposure. The Army has initiated a CERCLA Remedial Investigation at Yakima Training Center to further delineate the nature and extent of the PFAS releases and to evaluate the risk posed to human health from the releases.

6 SUMMARY

Off-post sampling of residential drinking water wells downgradient of Yakima Training Center occurred over three mobilizations in September 2021, January 2022, and July/August 2022. During the sampling events, 301 parent samples (collected at 299 wells located on 293 properties) and applicable quality assurance/quality control samples were collected, analyzed and validated in accordance with Army and USEPA guidance for PFAS in potable water. One hundred fifty-five (155) of the 301 samples had detections of PFOS and/or PFOA, with 62 of the 155 detections greater than 70 ppt for combined PFOS/PFOA concentrations. Bottled water was provided as an alternative drinking water source to the affected locations served by wells with PFOS/PFOA exceedances, and the TCRA (i.e., alternate water provision) was documented in an Action Memorandum. The Army has initiated a CERCLA Remedial Investigation at Yakima Training Center to further delineate the nature and extent of the PFAS releases and to evaluate the risk posed to human health from the releases.

7 REFERENCES

- Arcadis U.S., Inc (Arcadis). 2021. Final Preliminary Assessment and Site Inspection of Per- and Polyfluoroalkyl Substances, Yakima Training Center, Washington. October.
- Department of Defense (DoD) and Department of Energy. 2019. Consolidated Quality Systems Manual for Environmental Laboratories, Version 5.3. May.
- Ecology and Environment, Inc. 1993. Site Investigation Report: Yakima Training Center, Yakima, Washington. September.
- Science Applications International Corporation (SAIC). 1995. Final Resource Conservation and Recovery Act Facility Assessment Report, U.S. Army Yakima Training Center. September.
- Tetra Tech. 2017. Final Groundwater Monitoring Report: Fire Training Pit and Tracked Vehicle Repair/Old Mobilization and Training Equipment Site, Joint Base Lewis-McChord and Yakima Training Center, Yakima, Washington. June.
- Tetra Tech. 2018. 2017 Annual Groundwater Monitoring Report: Fire Training Pit and Tracked Vehicle Repair/Old Mobilization and Training Equipment Site, Joint Base Lewis-McChord and Yakima Training Center, Yakima, Washington. January.
- United States Environmental Protection Agency (USEPA). 2016. Lifetime Health Advisories and Health Effects Support Documents for Perfluorooctanoic Acid and Perfluorooctane Sulfonate. EPA-HQ-OW-2014-0138; FRL-9946-91-OW. Federal Register/ Vol. 81. No. 101. 25 May.

TABLE



Table 1 - Off-Post PFOS and PFOA Analytical Results
Joint Base Lewis-McChord - Yakima Training Center, WA
USAEC PFAS Preliminary Assessment/Site Inspection Addendum



Location	Sample ID / Parent Sample ID	Sample Date	Sample Type	PFOS (ng/L)		PFOA (ng/L)	
				Result	Qual	Result	Qual
YTC-OFFP-01	YTC-OFFP-01-DW-090821	09/08/2021	N	460		66	
YTC-OFFP-02	YTC-OFFP-02-DW-090821	09/08/2021	N	60	J+	11	
YTC-OFFP-03	YTC-OFFP-03-DW-090921	09/09/2021	N	2.9		2.1	
YTC-OFFP-04	YTC-OFFP-04-DW-090821	09/08/2021	N	24		9.3	J
YTC-OFFP-05	YTC-OFFP-05-DW-090921	09/09/2021	N	1500		150	
YTC-OFFP-06	YTC-OFFP-06-DW-090721	09/07/2021	N	60		2.4	
YTC-OFFP-07	YTC-OFFD-07-DW-090821	09/08/2021	N	210	J+	11	
YTC-OFFP-08	YTC-OFFP-08-DW-090821	09/08/2021	N	1100	J+	120	J+
YTC-OFFP-09	YTC-OFFP-09-DW-090821	09/08/2021	N	2.4		1.2	J
YTC-OFFP-10	YTC-OFFP-10-DW-090721	09/07/2021	N	37		1.9	
YTC-OFFP-11	YTC-OFFP-11-DW-090821	09/08/2021	N	11		1.7	J
YTC-OFFP-12	YTC-OFFP-12-DW-090921	09/09/2021	N	49		15	
YTC-OFFP-13	YTC-OFFP-13-DW-090721	09/07/2021	N	65		9.3	
YTC-OFFP-14	YTC-OFFP-14-DW-090721	09/07/2021	N	14		1.9	
YTC-OFFP-15	YTC-OFFP-15-DW-090721	09/07/2021	N	560		58	
YTC-OFFP-16	YTC-OFFD-16-DW-090921	09/09/2021	N	18	J-	2.3	J-
YTC-OFFP-17	YTC-OFFP-17-DW-090821	09/08/2021	N	8.9		2.3	
YTC-OFFP-18	YTC-OFFP-18-DW-090921	09/09/2021	N	200		9.0	
YTC-OFFP-19	YTC-OFFP-19-DW-090821	09/08/2021	N	1.1	J-	1.3	J-
	YTC-FD-1-DW-090821 / YTC-OFFP-19-DW-090821	09/08/2021	FD	1.9	J	1.4	J
YTC-OFFP-20	YTC-OFFP-20-DW-090921	09/09/2021	N	28		3.7	
YTC-OFFP-21	YTC-OFFP-21-DW-090921	09/09/2021	N	29		3.0	
YTC-PAIC-PRE	YTC-PAIC-PRE-DW-090921	09/09/2021	N	1.8	U	1.8	U
	YTC-FD-2-DW-090921 / YTC-PAIC-PRE-DW-090921	09/09/2021	FD	1.9	U	1.9	U
YTC-OFFP-24	YTC-OFFP-24-DW-011822	01/18/2022	N	20		2.1	
YTC-OFFP-25	YTC-OFFP-25-DW-012222	01/22/2022	N	26		2.5	
YTC-OFFP-26	YTC-OFFP-26-DW-011822	01/18/2022	N	1.7	J	2.3	U
YTC-OFFP-27	YTC-OFFP-27-DW-011822	01/18/2022	N	28	J	2.7	J
YTC-OFFP-28	YTC-OFFP-28-DW-011822	01/18/2022	N	4.1		1.9	U
YTC-OFFP-29	YTC-OFFP-29-DW-012222	01/21/2022	N	15		1.6	J

Table 1 - Off-Post PFOS and PFOA Analytical Results
Joint Base Lewis-McChord - Yakima Training Center, WA
USAEC PFAS Preliminary Assessment/Site Inspection Addendum



Location	Sample ID / Parent Sample ID	Sample Date	Sample Type	PFOS (ng/L)		PFOA (ng/L)	
				Result	Qual	Result	Qual
YTC-OFFP-30	YTC-OFFP-30-DW-011922	01/19/2022	N	16		1.9	J
YTC-OFFP-31	YTC-OFFP-31-DW-011922	01/19/2022	N	180		17	
YTC-OFFP-32	YTC-OFFP-32-DW-011922	01/19/2022	N	770		66	J-
YTC-OFFP-33	YTC-OFFP-33-DW-011922	01/19/2022	N	1.8	U	1.8	U
YTC-OFFP-34	YTC-OFFP-34-DW-011922	01/19/2022	N	2.0	U	2.0	U
YTC-OFFP-35	YTC-OFFP-35-DW-011922	01/19/2022	N	2.0	U	2.0	U
YTC-OFFP-36	YTC-OFFP-36-DW-011922	01/19/2022	N	2.1	U	2.1	U
YTC-OFFP-37	YTC-OFFP-37-DW-011922	01/19/2022	N	2.9		1.8	J
YTC-OFFP-38	YTC-OFFP-38-DW-011922	01/19/2022	N	150		16	
YTC-OFFP-39	YTC-OFFP-39-DW-011922	01/19/2022	N	31	J-	3.8	J-
	YTC-FD-01-DW-011922 / YTC-OFFP-39-DW-011922	01/19/2022	FD	32		3.7	
YTC-OFFP-40	YTC-OFFP-40-DW-011922	01/19/2022	N	20		2.7	
YTC-OFFP-41	YTC-OFFP-41-DW-011922	01/19/2022	N	12		3.9	
YTC-OFFP-42	YTC-OFFP-42-DW-011922	01/19/2022	N	540		62	
YTC-OFFP-43	YTC-OFFP-43-DW-012722	01/27/2022	N	2.0	U	2.0	U
YTC-OFFP-44	YTC-OFFP-44-DW-012022	01/20/2022	N	2.0	U	2.0	U
YTC-OFFP-45	YTC-OFFP-45-DW-072622	07/26/2022	N	1.7	U	1.7	U
YTC-OFFP-46	YTC-OFFP-46-DW-012622	01/26/2022	N	1.9	U	1.9	U
YTC-OFFP-47	YTC-OFFP-47-DW-012022	01/20/2022	N	1.9	U	1.9	U
YTC-OFFP-48	YTC-OFFP-48-DW-012022	01/20/2022	N	1.8	U	1.8	U
YTC-OFFP-49	YTC-OFFP-49-DW-012022	01/20/2022	N	1.9	U	1.9	U
YTC-OFFP-51	YTC-OFFP-51-DW-012722	01/27/2022	N	73		14	
YTC-OFFP-52	YTC-OFFP-52-DW-012022	01/20/2022	N	47		11	
YTC-OFFP-53	YTC-OFFP-53-DW-012022	01/20/2022	N	0.96	J	1.9	U
YTC-OFFP-54	YTC-OFFP-54-DW-012022	01/20/2022	N	2.0	U	2.0	U
	YTC-FD-02-DW-012022 / YTC-OFFP-54-DW-012022	01/20/2022	FD	2.0	U	2.0	U
YTC-OFFP-55	YTC-OFFP-55-DW-012122	01/21/2022	N	510		72	
YTC-OFFP-56	YTC-OFFP-56-DW-012122	01/21/2022	N	410		61	
YTC-OFFP-57	YTC-OFFP-57-DW-012022	01/20/2022	N	2.5		1.7	J
YTC-OFFP-59	YTC-OFFP-59-DW-012122	01/21/2022	N	350		59	

Table 1 - Off-Post PFOS and PFOA Analytical Results
Joint Base Lewis-McChord - Yakima Training Center, WA
USAEC PFAS Preliminary Assessment/Site Inspection Addendum



Location	Sample ID / Parent Sample ID	Sample Date	Sample Type	PFOS (ng/L)		PFOA (ng/L)	
				Result	Qual	Result	Qual
YTC-OFFP-60	YTC-OFFP-60-DW-012122	01/21/2022	N	320		76	
YTC-OFFP-61	YTC-OFFP-61-DW-012122	01/21/2022	N	86		17	
YTC-OFFP-62	YTC-OFFP-62-DW-012122	01/21/2022	N	740		130	
YTC-OFFP-63	YTC-OFFP-63-DW-012122	01/21/2022	N	330		60	
YTC-OFFP-64	YTC-OFFP-64-DW-012122	01/21/2022	N	1.8	U	1.8	U
YTC-OFFP-65	YTC-OFFP-65-DW-012122	01/21/2022	N	390		92	
YTC-OFFP-66	YTC-OFFP-66-DW-012122	01/21/2022	N	800		120	
YTC-OFFP-67	YTC-OFFP-67-DW-012122	01/21/2022	N	140		29	
YTC-OFFP-70	YTC-OFFP-70-DW-012122	01/21/2022	N	330		60	
YTC-OFFP-71	YTC-OFFP-71-DW-012122	01/21/2022	N	12		5.7	
YTC-OFFP-72	YTC-OFFP-72-DW-012422	01/24/2022	N	240		33	
YTC-OFFP-73	YTC-OFFP-73-DW-012422	01/24/2022	N	410		63	
YTC-OFFP-74	YTC-OFFP-74-DW-012422	01/24/2022	N	200		22	
YTC-OFFP-76	YTC-OFFP-76-DW-012422	01/24/2022	N	11		10	
YTC-OFFP-77	YTC-OFFP-77-DW-012422	01/24/2022	N	380		36	J+
	YTC-FD-03-DW-012422 / YTC-OFFP-77-DW-012422	01/24/2022	FD	370		35	
YTC-OFFP-78	YTC-OFFP-78-DW-012422	01/24/2022	N	15		7.0	
YTC-OFFP-79	YTC-OFFP-79-DW-012422	01/24/2022	N	17		5.1	
YTC-OFFP-80	YTC-OFFP-80-DW-012422	01/24/2022	N	27		9.7	
YTC-OFFP-81	YTC-OFFP-81-DW-012422	01/24/2022	N	500		63	
YTC-OFFP-82	YTC-OFFP-82-DW-080322	08/03/2022	N	340		35	
YTC-OFFP-83	YTC-OFFP-83-DW-012422	01/24/2022	N	440		54	
YTC-OFFP-84	YTC-OFFP-84-DW-012422	01/24/2022	N	74		15	
YTC-OFFP-85	YTC-OFFP-85-DW-012422	01/24/2022	N	390		45	
YTC-OFFP-86	YTC-OFFP-86-DW-012422	01/24/2022	N	54		12	
YTC-OFFP-86	YTC-OFFP-86-DW-080522	08/05/2022	N	72		14	
YTC-OFFP-88	YTC-OFFP-88-DW-012422	01/24/2022	N	330		26	
YTC-OFFP-89	YTC-OFFP-89-DW-012422	01/24/2022	N	9.4		4.1	
YTC-OFFP-90	YTC-OFFP-90-DW-012522	01/25/2022	N	2.1	U	2.1	U
YTC-OFFP-91	YTC-OFFP-91-DW-012522	01/25/2022	N	310	J+	22	
YTC-OFFP-92	YTC-OFFP-92-DW-012522	01/25/2022	N	74		10	

Table 1 - Off-Post PFOS and PFOA Analytical Results
Joint Base Lewis-McChord - Yakima Training Center, WA
USAEC PFAS Preliminary Assessment/Site Inspection Addendum



Location	Sample ID / Parent Sample ID	Sample Date	Sample Type	PFOS (ng/L)		PFOA (ng/L)	
				Result	Qual	Result	Qual
YTC-OFFP-93	YTC-OFFP-93-DW-012522	01/25/2022	N	16		7.4	
YTC-OFFP-94	YTC-OFFP-94-DW-012622	01/26/2022	N	2.0	U	2.0	U
YTC-OFFP-95	YTC-OFFP-95-DW-012522	01/25/2022	N	43		13	
YTC-OFFP-96	YTC-OFFP-96-DW-012522	01/25/2022	N	2.2	J	4.3	
YTC-OFFP-97	YTC-OFFP-97-DW-012522	01/25/2022	N	1.8	U	0.96	J
YTC-OFFP-99	YTC-OFFP-99-DW-012522	01/25/2022	N	82		10	
YTC-OFFP-100	YTC-OFFP-100-DW-012522	01/25/2022	N	140		20	
YTC-OFFP-101	YTC-OFFP-101-DW-012522	01/25/2022	N	79		7.4	
YTC-OFFP-102	YTC-OFFP-102-DW-012522	01/25/2022	N	1.2	J	2.0	U
	YTC-OFFP-FD-04-012522 / YTC-OFFP-102-DW-012522	01/25/2022	FD	1.2	J	1.9	U
YTC-OFFP-103	YTC-OFFP-103-DW-012522	01/25/2022	N	1.9	U	1.9	U
YTC-OFFP-104	YTC-OFFP-104-DW-012522	01/25/2022	N	2.4	J	2.4	
YTC-OFFP-105	YTC-OFFP-105-DW-012622	01/26/2022	N	1.9	U	1.9	U
YTC-OFFP-106	YTC-OFFP-106-DW-012622	01/26/2022	N	1.9	U	1.9	U
YTC-OFFP-108	YTC-OFFP-108-DW-012622	01/26/2022	N	1.8	U	1.8	U
YTC-OFFP-110	YTC-OFFP-110-DW-012622	01/26/2022	N	1.9	U	1.9	U
YTC-OFFP-111	YTC-OFFP-111-DW-012622	01/26/2022	N	2.0	U	2.4	
YTC-OFFP-112	YTC-OFFP-112-DW-012622	01/26/2022	N	1.9	U	1.9	U
YTC-OFFP-113	YTC-OFFP-113-DW-012622	01/26/2022	N	2.0	U	2.0	U
YTC-OFFP-114	YTC-OFFP-114-DW-012622	01/26/2022	N	1.9	U	1.9	U
YTC-OFFP-115	YTC-OFFP-115-DW-012722	01/27/2022	N	1.8	U	1.8	U
YTC-OFFP-116	YTC-OFFP-116-DW-012622	01/26/2022	N	2.1	U	2.1	U
YTC-OFFP-117	YTC-OFFP-117-DW-012622	01/26/2022	N	2.1	U	2.1	U
YTC-OFFP-118	YTC-OFFP-118-DW-012622	01/26/2022	N	20		5.0	
YTC-OFFP-120	YTC-OFFP-120-DW-012622	01/26/2022	N	1.9	U	1.9	U
	YTC-OFFP-FD-05-012622 / YTC-OFFP-120-DW-012622	01/26/2022	FD	2.0	U	2.0	U
YTC-OFFP-121	YTC-OFFP-121-DW-012722	01/27/2022	N	1.9	U	1.9	U
YTC-OFFP-122	YTC-OFFP-122-DW-072522	07/25/2022	N	1.7	U	1.7	U
YTC-OFFP-123	YTC-OFFP-123-DW-072522	07/25/2022	N	1.7	U	1.7	U

Table 1 - Off-Post PFOS and PFOA Analytical Results
Joint Base Lewis-McChord - Yakima Training Center, WA
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Location	Sample ID / Parent Sample ID	Sample Date	Sample Type	PFOS (ng/L)		PFOA (ng/L)	
				Result	Qual	Result	Qual
YTC-OFFP-124	YTC-OFFP-124-DW-072522	07/25/2022	N	1.7	U	1.7	U
	YTC-OFFP-FD-01-072522 / YTC-OFFP-124-DW-072522	07/25/2022	FD	1.7	U	1.7	U
YTC-OFFP-125	YTC-OFFP-125-DW-072522	07/25/2022	N	1.7	U	1.7	U
YTC-OFFP-126	YTC-OFFP-126-DW-072522	07/25/2022	N	1.8	U	1.8	U
YTC-OFFP-127	YTC-OFFP-127-DW-072522	07/25/2022	N	1.7	U	1.7	U
YTC-OFFP-128	YTC-OFFP-128-DW-072722	07/27/2022	N	1.7	U	1.7	UB
YTC-OFFP-129	YTC-OFFP-129-DW-072522	07/25/2022	N	1.7	U	1.7	U
YTC-OFFP-130	YTC-OFFP-130-DW-072522	07/25/2022	N	1.7	U	1.7	U
YTC-OFFP-131	YTC-OFFP-131-DW-080222	08/02/2022	N	1.8	U	1.8	U
YTC-OFFP-132	YTC-OFFP-132-DW-072522	07/25/2022	N	1.7	U	1.7	U
YTC-OFFP-134	YTC-OFFP-134-DW-072522	07/25/2022	N	1.7	U	1.7	U
YTC-OFFP-136	YTC-OFFP-136-DW-072622	07/26/2022	N	1.7	UJ	1.7	UJ
YTC-OFFP-137	YTC-OFFP-137-DW-072622	07/26/2022	N	1.8	UJ	1.8	U
YTC-OFFP-138	YTC-OFFP-138-DW-072622	07/26/2022	N	1.7	UJ	1.7	U
YTC-OFFP-139	YTC-OFFP-139-DW-072622	07/26/2022	N	1.7	U	1.7	U
YTC-OFFP-140	YTC-OFFP-140-DW-072622	07/26/2022	N	1.8	U	1.8	U
YTC-OFFP-141	YTC-OFFP-141-DW-072622	07/26/2022	N	1.7	U	1.7	U
YTC-OFFP-142	YTC-OFFP-142-DW-072622	07/26/2022	N	1.7	UJ	1.7	U
YTC-OFFP-143	YTC-OFFP-143-DW-072622	07/26/2022	N	1.8	U	1.8	U
	YTC-OFFP-FD-02-072622 / YTC-OFFP-143-DW-072622	07/26/2022	FD	1.7	UJ	1.7	U
YTC-OFFP-144	YTC-OFFP-144-DW-072622	07/26/2022	N	1.7	U	1.7	U
YTC-OFFP-145	YTC-OFFP-145-DW-072622	07/26/2022	N	3.0	J-	2.4	
YTC-OFFP-147	YTC-OFFP-147-DW-072922	07/29/2022	N	1.7	U	1.7	U
YTC-OFFP-148	YTC-OFFP-148-DW-072722	07/27/2022	N	1.7	U	1.7	UB
YTC-OFFP-149	YTC-OFFP-149-DW-072622	07/26/2022	N	3.5		1.5	J
YTC-OFFP-150	YTC-OFFP-150-DW-072722	07/27/2022	N	1.7	U	1.7	UB
YTC-OFFP-151	YTC-OFFP-151-DW-072722	07/27/2022	N	1.7	U	1.7	UB
YTC-OFFP-152	YTC-OFFP-152-DW-072722	07/27/2022	N	1.7	U	1.7	UB
YTC-OFFP-153	YTC-OFFP-153-DW-072722	07/27/2022	N	1.7	UJ	1.7	UB
YTC-OFFP-154	YTC-OFFP-154-DW-072722	07/27/2022	N	1.7	U	1.7	UB

Table 1 - Off-Post PFOS and PFOA Analytical Results
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Location	Sample ID / Parent Sample ID	Sample Date	Sample Type	PFOS (ng/L)		PFOA (ng/L)	
				Result	Qual	Result	Qual
YTC-OFFP-155	YTC-OFFP-155-DW-072722	07/27/2022	N	1.6	U	1.6	UB
YTC-OFFP-156	YTC-OFFP-156-DW-072722	07/27/2022	N	1.8	U	1.8	UB
YTC-OFFP-157	YTC-OFFP-157-DW-072722	07/27/2022	N	1.7	U	1.7	UB
YTC-OFFP-158	YTC-OFFP-158-DW-072722	07/27/2022	N	1.8	U	1.8	UB
YTC-OFFP-159	YTC-OFFP-159-DW-072722	07/27/2022	N	1.7	U	1.7	UB
YTC-OFFP-160	YTC-OFFP-160-DW-080122	08/01/2022	N	1.7	U	1.7	U
YTC-OFFP-162	YTC-OFFP-162-DW-072722	07/27/2022	N	1.8	UJ	1.8	UB
YTC-OFFP-163	YTC-OFFP-163-DW-072722	07/27/2022	N	1.7	J	1.7	UB
	YTC-OFFP-FD-03-DW-072722 / YTC-OFFP-163-DW-072722	07/27/2022	FD	1.8	J	1.8	UB
YTC-OFFP-164	YTC-OFFP-164-DW-072722	07/27/2022	N	1.7	J	1.7	UB
YTC-OFFP-165	YTC-OFFP-165-DW-072722	07/27/2022	N	1.7	U	1.7	UB
YTC-OFFP-166	YTC-OFFP-166-DW-072722	07/27/2022	N	1.7	U	1.7	UB
YTC-OFFP-167	YTC-OFFP-167-DW-072622	07/26/2022	N	1.7	U	1.7	U
YTC-OFFP-168	YTC-OFFP-168-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-169	YTC-OFFP-169-DW-072822	07/28/2022	N	1.8	U	1.8	U
YTC-OFFP-170	YTC-OFFP-170-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-171	YTC-OFFP-171-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-172	YTC-OFFP-172-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-173	YTC-OFFP-173-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-174	YTC-OFFP-174-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-175	YTC-OFFP-175-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-176	YTC-OFFP-176-DW-072822	07/28/2022	N	1.6	U	1.6	U
YTC-OFFP-177	YTC-OFFP-177-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-178	YTC-OFFP-178-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-179	YTC-OFFP-179-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-180	YTC-OFFP-180-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-181	YTC-OFFP-181-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-182	YTC-OFFP-182-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-183	YTC-OFFP-183-DW-072822	07/28/2022	N	1.7	U	1.7	U
	YTC-OFFP-FD-04-072822 / YTC- OFFP-183-DW-072822	07/28/2022	FD	1.8	U	1.8	U

Table 1 - Off-Post PFOS and PFOA Analytical Results
Joint Base Lewis-McChord - Yakima Training Center, WA
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Location	Sample ID / Parent Sample ID	Sample Date	Sample Type	PFOS (ng/L)		PFOA (ng/L)	
				Result	Qual	Result	Qual
YTC-OFFP-184	YTC-OFFP-184-DW-072822	07/28/2022	N	1.8	U	1.8	U
YTC-OFFP-185	YTC-OFFP-185-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-186	YTC-OFFP-186-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-188	YTC-OFFP-188-DW-072922	07/29/2022	N	1.7	U	1.7	U
YTC-OFFP-189	YTC-OFFP-189-DW-072922	07/29/2022	N	1.8	U	1.8	U
YTC-OFFP-190	YTC-OFFP-190-DW-072922	07/29/2022	N	1.7	U	1.7	U
YTC-OFFP-191	YTC-OFFP-191-DW-072922	07/29/2022	N	1.8	U	1.8	U
YTC-OFFP-192	YTC-OFFP-192-DW-072922	07/29/2022	N	1.8	U	1.8	U
YTC-OFFP-193	YTC-OFFP-193-DW-072922	07/29/2022	N	1.7	U	1.7	U
YTC-OFFP-195	YTC-OFFP-195-DW-072922	07/29/2022	N	1.7	U	1.7	U
YTC-OFFP-196	YTC-OFFP-196-DW-072922	07/29/2022	N	1.7	U	1.7	U
YTC-OFFP-197	YTC-OFFP-197-DW-072922	07/29/2022	N	1.7	J	1.7	J
YTC-OFFP-198	YTC-OFFP-198-DW-072922	07/29/2022	N	1.9	U	1.9	U
YTC-OFFP-199	YTC-OFFP-199-DW-072922	07/29/2022	N	1.6	U	1.6	U
YTC-OFFP-200	YTC-OFFP-200-DW-072622	07/26/2022	N	1.6	J	1.6	U
YTC-OFFP-201	YTC-OFFP-201-DW-072922	07/29/2022	N	1.7	U	1.7	U
YTC-OFFP-202	YTC-OFFP-202-DW-080122	08/01/2022	N	1.8	U	1.8	U
YTC-OFFP-203	YTC-OFFP-203-DW-072922	07/29/2022	N	1.7	U	1.7	U
	YTC-OFFP-FD-05-DW-072922 / YTC-OFFP-203-DW-072922	07/29/2022	FD	1.8	U	1.8	U
YTC-OFFP-204	YTC-OFFP-204-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-205	YTC-OFFP-205-DW-072922	07/29/2022	N	1.7	U	1.7	U
YTC-OFFP-206	YTC-OFFP-206-DW-072922	07/29/2022	N	1.7	U	1.7	U
YTC-OFFP-208	YTC-OFFP-208-DW-072822	07/28/2022	N	1.8	U	1.8	U
YTC-OFFP-209	YTC-OFFP-209-DW-072822	07/28/2022	N	1.8	U	1.8	U
YTC-OFFP-210	YTC-OFFP-210-DW-073022	07/30/2022	N	0.74	J	1.7	U
YTC-OFFP-211	YTC-OFFP-211-DW-072922	07/29/2022	N	1.6	U	1.6	U
YTC-OFFP-213	YTC-OFFP-213-DW-072822	07/28/2022	N	87		11	
YTC-OFFP-214	YTC-OFFP-214-DW-072922	07/29/2022	N	42		9.5	
YTC-OFFP-215	YTC-OFFP-215-DW-072922	07/29/2022	N	1.7	U	1.7	U
YTC-OFFP-216	YTC-OFFP-216-DW-072922	07/29/2022	N	1.9	U	1.9	U
YTC-OFFP-217	YTC-OFFP-217-DW-072822	07/28/2022	N	0.66	J	0.85	J

Table 1 - Off-Post PFOS and PFOA Analytical Results
Joint Base Lewis-McChord - Yakima Training Center, WA
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Location	Sample ID / Parent Sample ID	Sample Date	Sample Type	PFOS (ng/L)		PFOA (ng/L)	
				Result	Qual	Result	Qual
YTC-OFFP-218	YTC-OFFP-218-DW-072622	07/26/2022	N	2.4		1.7	J
YTC-OFFP-219	YTC-OFFP-219-DW-080122	08/01/2022	N	1.8	U	1.8	U
YTC-OFFP-220	YTC-OFFP-220-DW-080122	08/01/2022	N	1.8	U	1.8	U
YTC-OFFP-221	YTC-OFFP-221-DW-072922	07/29/2022	N	1.8	U	1.8	U
YTC-OFFP-222	YTC-OFFP-222-DW-080122	08/01/2022	N	1.8	U	1.8	U
YTC-OFFP-223	YTC-OFFP-223-DW-080122	08/01/2022	N	1.8	U	1.8	U
	YTC-OFFP-FD-06-DW-080122 / YTC-OFFP-223-DW-080122	08/01/2022	FD	1.7	U	1.7	U
YTC-OFFP-224	YTC-OFFP-224-DW-072922	07/29/2022	N	1.7	U	1.7	U
YTC-OFFP-225	YTC-OFFP-225-DW-080122	08/01/2022	N	1.7	U	0.77	J
YTC-OFFP-226	YTC-OFFP-226-DW-080122	08/01/2022	N	1.8	U	1.8	U
YTC-OFFP-227	YTC-OFFP-227-DW-072722	07/27/2022	N	1.7	U	1.7	UB
YTC-OFFP-228	YTC-OFFP-228-DW-080122	08/01/2022	N	1.9	U	1.9	U
YTC-OFFP-229	YTC-OFFP-229-DW-072922	07/29/2022	N	1.8	U	1.8	U
YTC-OFFP-230	YTC-OFFP-230-DW-080122	08/01/2022	N	1.7	U	1.7	U
YTC-OFFP-231	YTC-OFFP-231-DW-080122	08/01/2022	N	1.8	U	1.8	U
YTC-OFFP-232	YTC-OFFP-232-DW-080122	08/01/2022	N	1.7	U	1.7	J
YTC-OFFP-233	YTC-OFFP-233-DW-072922	07/29/2022	N	1.7	U	1.7	U
YTC-OFFP-234	YTC-OFFP-234-DW-072822	07/28/2022	N	1.7	U	1.7	U
YTC-OFFP-235	YTC-OFFP-235-DW-080122	08/01/2022	N	1.8	U	1.8	U
YTC-OFFP-236	YTC-OFFP-236-DW-080222	08/02/2022	N	1.9	U	1.9	U
YTC-OFFP-237	YTC-OFFP-237-DW-072922	07/29/2022	N	1.8	U	1.8	U
YTC-OFFP-238	YTC-OFFP-238-DW-072722	07/27/2022	N	1.7	U	1.7	UB
YTC-OFFP-239	YTC-OFFP-239-DW-080222	08/02/2022	N	1.7	U	1.7	U
YTC-OFFP-240	YTC-OFFP-240-DW-080222	08/02/2022	N	1.7	U	1.7	U
YTC-OFFP-241	YTC-OFFP-241-DW-080222	08/02/2022	N	1.8	U	1.8	U
YTC-OFFP-242	YTC-OFFP-242-DW-080222	08/02/2022	N	92		13	
	YTC-OFFP-FD-07-DW-080222 / YTC-OFFP-242-DW-080222	08/02/2022	FD	89		12	
YTC-OFFP-243	YTC-OFFP-243-DW-072922	07/29/2022	N	1.8	U	1.8	U
YTC-OFFP-244	YTC-OFFP-244-DW-080222	08/02/2022	N	1.8	U	1.8	U
YTC-OFFP-245	YTC-OFFP-245-DW-080222	08/02/2022	N	1.7	U	1.7	U

Table 1 - Off-Post PFOS and PFOA Analytical Results
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Location	Sample ID / Parent Sample ID	Sample Date	Sample Type	PFOS (ng/L)		PFOA (ng/L)	
				Result	Qual	Result	Qual
YTC-OFFP-246	YTC-OFFP-246-DW-080222	08/02/2022	N	1.7	U	1.7	U
YTC-OFFP-247	YTC-OFFP-247-DW-080222	08/02/2022	N	1.7	U	1.7	U
YTC-OFFP-248	YTC-OFFP-248-DW-080222	08/02/2022	N	0.49	J	1.6	J
YTC-OFFP-249	YTC-OFFP-249-DW-080222	08/02/2022	N	1.8	U	1.8	U
YTC-OFFP-250	YTC-OFFP-250-DW-080222	08/02/2022	N	1.7	U	1.7	U
YTC-OFFP-251	YTC-OFFP-251-DW-072622	07/26/2022	N	1.7	UJ	1.7	U
YTC-OFFP-252	YTC-OFFP-252-DW-080222	08/02/2022	N	40		5.4	
YTC-OFFP-253	YTC-OFFP-253-DW-080222	08/02/2022	N	1.4	J	1.8	J
YTC-OFFP-254	YTC-OFFP-254-DW-072822	07/28/2022	N	1.8	U	1.8	U
YTC-OFFP-255	YTC-OFFP-255-DW-080322	08/03/2022	N	1.8	J	1.8	J
YTC-OFFP-256	YTC-OFFP-256-DW-080422	08/04/2022	N	2.0		1.2	J
YTC-OFFP-257	YTC-OFFP-257-DW-072622	07/26/2022	N	1.7	UJ	1.7	UJ
YTC-OFFP-258	YTC-OFFP-258-DW-080322	08/03/2022	N	1.6	J	1.7	
YTC-OFFP-259	YTC-OFFP-259-DW-080322	08/03/2022	N	1.9	U	1.9	U
YTC-OFFP-260	YTC-OFFP-260-DW-080322	08/03/2022	N	1.8	J	0.85	J
YTC-OFFP-261	YTC-OFFP-261-DW-080322	08/03/2022	N	3.4		2.3	
YTC-OFFP-262	YTC-OFFP-262-DW-080322	08/03/2022	N	9.2		5.0	
YTC-OFFP-263	YTC-OFFP-263-DW-080322	08/03/2022	N	2.1		1.0	J
	YTC-OFFP-FD-08-DW-080322 / YTC-OFFP-263-DW-080322	08/03/2022	FD	2.1		1.1	J
YTC-OFFP-264	YTC-OFFP-264-DW-072622	07/26/2022	N	7.0	J-	4.1	
YTC-OFFP-265	YTC-OFFP-265-DW-080322	08/03/2022	N	8.3		2.7	
YTC-OFFP-266	YTC-OFFP-266-DW-080322	08/03/2022	N	6.8		5.4	
YTC-OFFP-267	YTC-OFFP-267-DW-072922	07/29/2022	N	1.3	J	1.4	J
YTC-OFFP-268	YTC-OFFP-268-DW-072922	07/29/2022	N	11		3.1	
YTC-OFFP-269	YTC-OFFP-269-DW-080322	08/03/2022	N	4.1		2.4	
YTC-OFFP-270	YTC-OFFP-270-DW-080322	08/03/2022	N	5.7		2.9	
YTC-OFFP-271A	YTC-OFFP-271A-DW-080322	08/03/2022	N	290		61	
YTC-OFFP-271B	YTC-OFFP-271B-DW-080322	08/03/2022	N	280		62	
YTC-OFFP-272	YTC-OFFP-272-DW-080322	08/03/2022	N	1.8	U	1.8	U
YTC-OFFP-273	YTC-OFFP-273-DW-080422	08/04/2022	N	2.2		1.8	U
YTC-OFFP-275	YTC-OFFP-275-DW-072822	07/28/2022	N	150		34	

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Location	Sample ID / Parent Sample ID	Sample Date	Sample Type	PFOS (ng/L)		PFOA (ng/L)	
				Result	Qual	Result	Qual
YTC-OFFP-276	YTC-OFFP-276-DW-080422	08/04/2022	N	23		6.0	
YTC-OFFP-277	YTC-OFFP-277-DW-080422	08/04/2022	N	3.0		1.7	J
YTC-OFFP-278	YTC-OFFP-278-DW-080422	08/04/2022	N	150		48	
YTC-OFFP-279	YTC-OFFP-279-DW-080422	08/04/2022	N	67		27	
YTC-OFFP-280	YTC-OFFP-280-DW-080122	08/01/2022	N	14	J-	2.9	J-
YTC-OFFP-281	YTC-OFFP-281-DW-072722	07/27/2022	N	8.6	J	3.1	J
YTC-OFFP-282	YTC-OFFP-282-DW-080422	08/04/2022	N	11		3.7	
	YTC-OFFP-FD-09-080422 / YTC-OFFP-282-DW-080422	08/04/2022	FD	11		3.8	
YTC-OFFP-284	YTC-OFFP-284-DW-072822	07/28/2022	N	220		26	
YTC-OFFP-285	YTC-OFFP-285-DW-080422	08/04/2022	N	120		18	
YTC-OFFP-286	YTC-OFFP-286-DW-080422	08/04/2022	N	2.1		1.7	J
YTC-OFFP-287	YTC-OFFP-287-DW-080422	08/04/2022	N	59		8.4	
YTC-OFFP-288	YTC-OFFP-288-DW-080422	08/04/2022	N	98		20	
YTC-OFFP-289	YTC-OFFP-289-DW-072822	07/28/2022	N	200	J	29	
YTC-OFFP-290	YTC-OFFP-290-DW-080422	08/04/2022	N	160		49	
YTC-OFFP-291	YTC-OFFP-291-DW-080422	08/04/2022	N	52		8.1	
YTC-OFFP-292	YTC-OFFP-292-DW-080122	08/01/2022	N	130	J-	17	J-
YTC-OFFP-293	YTC-OFFP-293-DW-080522	08/05/2022	N	54		8.3	
YTC-OFFP-294	YTC-OFFP-294-DW-080522	08/05/2022	N	300		50	
YTC-OFFP-295	YTC-OFFP-295-DW-080522	08/05/2022	N	380		47	
YTC-OFFP-296	YTC-OFFP-296-DW-080522	08/05/2022	N	27		7.8	
YTC-OFFP-297	YTC-OFFP-297-DW-080522	08/05/2022	N	400		68	
YTC-OFFP-298	YTC-OFFP-298-DW-080522	08/05/2022	N	10		6.0	
YTC-OFFP-300	YTC-OFFP-300-DW-072722	07/27/2022	N	54		24	
YTC-OFFP-301	YTC-OFFP-301-DW-080522	08/05/2022	N	310		42	
YTC-OFFP-302	YTC-OFFP-302-DW-080122	08/01/2022	N	71		14	
	YTC-OFFP-FD-10-DW-080122 / YTC-OFFP-302-DW-080122	08/01/2022	FD	72		14	
YTC-OFFP-303	YTC-OFFP-303-DW-080122	08/01/2022	N	1.7		1.4	J
YTC-OFFP-304	YTC-OFFP-304-DW-080322	08/03/2022	N	67		8.1	
YTC-OFFP-305	YTC-OFFP-305-DW-080522	08/05/2022	N	220		64	

Table 1 - Off-Post PFOS and PFOA Analytical Results
Joint Base Lewis-McChord - Yakima Training Center, WA
USAEC PFAS Preliminary Assessment/Site Inspection Addendum



Location	Sample ID / Parent Sample ID	Sample Date	Sample Type	PFOS (ng/L)		PFOA (ng/L)	
				Result	Qual	Result	Qual
YTC-OFFP-306	YTC-OFFP-306-DW-080122	08/01/2022	N	1.7	J	1.7	J
YTC-OFFP-307	YTC-OFFP-307-DW-080122	08/01/2022	N	1.8	J	1.8	U
YTC-OFFP-308	YTC-OFFP-308-DW-080122	08/01/2022	N	2.1		0.62	J
YTC-OFFP-309	YTC-OFFP-309-DW-080122	08/01/2022	N	1.7	J	1.7	J
YTC-OFFP-310	YTC-OFFP-310-DW-080422	08/04/2022	N	59		9.1	
YTC-OFFP-311	YTC-OFFP-311-DW-080422	08/04/2022	N	31		4.8	
YTC-OFFP-313	YTC-OFFP-313-DW-072722	07/27/2022	N	1.8	U	1.8	U
YTC-OFFP-314	YTC-OFFP-314-DW-072522	07/25/2022	N	1.7	U	1.7	U
YTC-OFFP-315	YTC-OFFP-315-DW-080122	08/01/2022	N	1.8	U	1.8	U
YTC-OFFP-316	YTC-OFFP-316-DW-072522	07/25/2022	N	20		4.9	
YTC-OFFP-317	YTC-OFFP-317-DW-073022	07/30/2022	N	0.64	J	1.2	J
YTC-OFFP-318	YTC-OFFP-318-DW-072722	07/27/2022	N	1.7	U	1.7	UB
YTC-OFFP-319	YTC-OFFP-319-DW-072722	07/27/2022	N	1.9	U	1.9	UB
YTC-OFFP-320	YTC-OFFP-320-DW-072922	07/29/2022	N	68		13	
YTC-OFFP-321	YTC-OFFP-321-DW-080222	08/02/2022	N	44		3.8	
YTC-OFFP-322	YTC-OFFP-322-DW-080322	08/03/2022	N	1.7	U	1.7	U

**Table 1 - Off-Post PFOS and PFOA Analytical Results
Joint Base Lewis-McChord - Yakima Training Center, WA
USAEC PFAS Preliminary Assessment/Site Inspection Addendum**



Notes:

1. **Bolded** values indicate the result was detected greater than the limit of detection.
2. Grey shaded values indicate the result was detected greater than the 2016 United States Environmental Protection Agency lifetime health advisory of 70 ng/L (PFOS, PFOA, or the sum of the two).

Acronyms/Abbreviations:

FD = field duplicate sample

ID = identification

N = primary sample

ng/L = nanograms per liter (parts per trillion)

OFFP = off post

PFAS = per- and polyfluoroalkyl substances

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

ppt = parts per trillion

Qual = qualifier

YTC = Yakima Training Center, Washington

Qualifiers:

J = The analyte was positively identified; however the associated numerical value is an estimated concentration only

J- = The result is an estimated quantity; the result may be biased low.

J+ = The result is an estimated quantity; the result may be biased high.

U = The analyte was analyzed for but the result was not detected above the limit of quantitation (LOQ).

UB = The analyte is considered nondetect at the listed value due to associated blank contamination.

UJ = The analyte was analyzed for but was not detected. The reported limit of quantitation (LOQ) is approximate and may be inaccurate or imprecise.

FIGURES

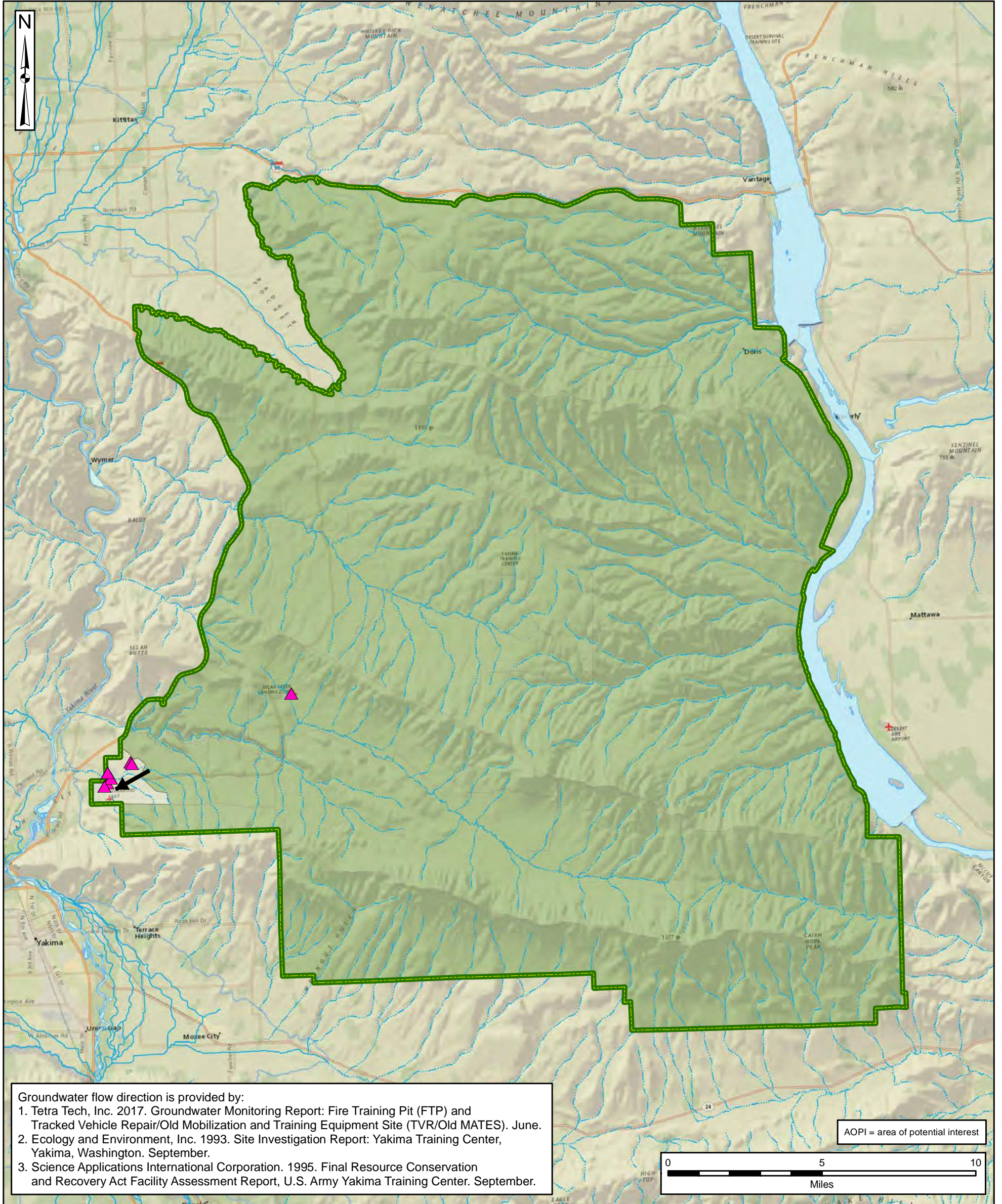




USAEC PFAS - Preliminary Assessment / Site Inspection
 Joint Base Lewis-McChord
 Yakima Training Center (JBLM YTC), WA



Figure 1 – AOPI Locations



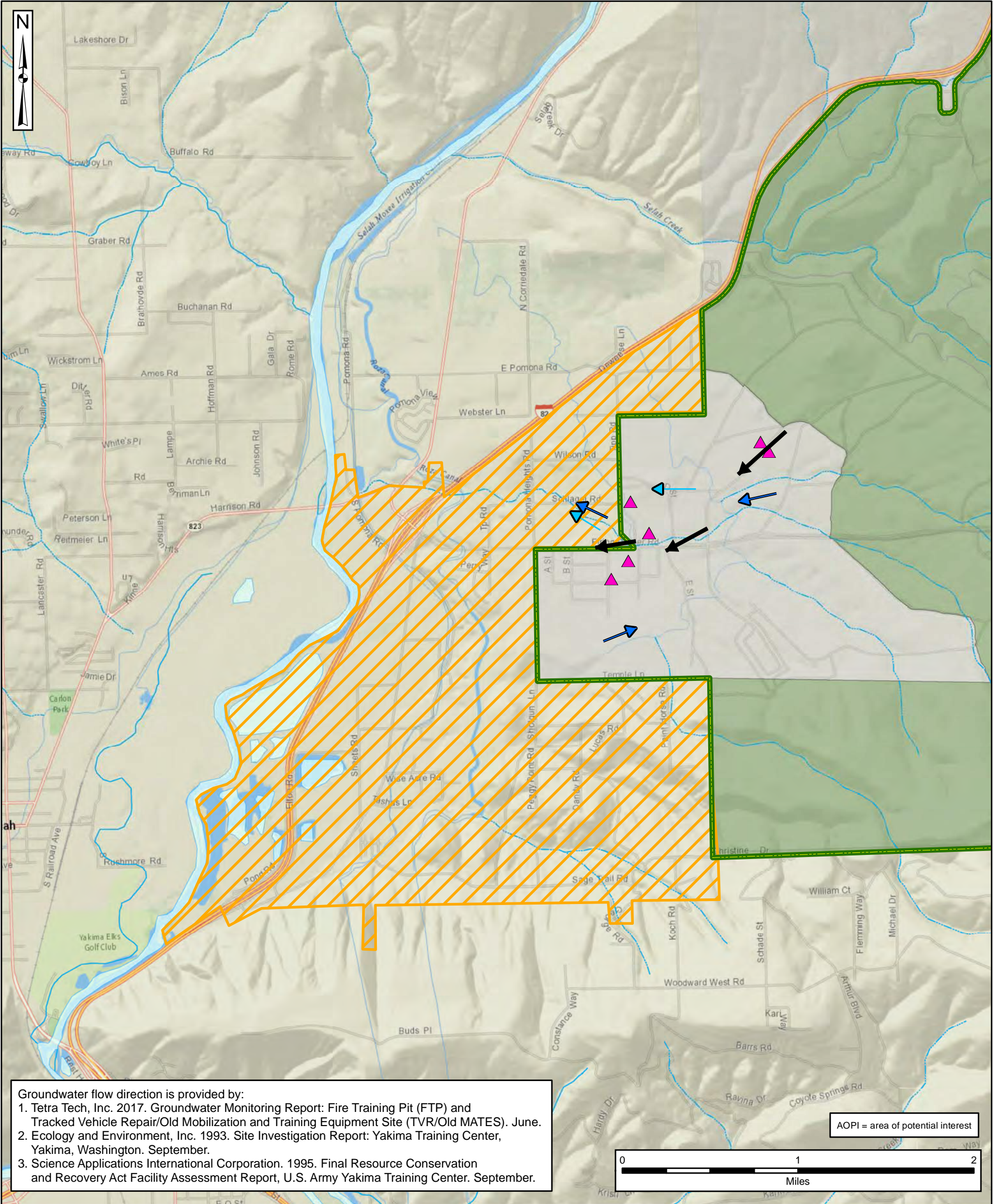
- Installation Boundary
- River/Stream (Perennial)
- Perched Groundwater Flow Direction
- Cantonment Area
- River/Stream (Intermittent)
- AOPI



**USAEC PFAS - Preliminary Assessment / Site Inspection
Joint Base Lewis-McChord
Yakima Training Center (JBLM YTC), WA**



Figure 2 – Off-Post Evaluation Area



Legend

- | | | | | | |
|--|--------------------------|--|-----------------------------|--|------------------------------------|
| | Installation Boundary | | AOPI | | Perched Groundwater Flow Direction |
| | Cantonment Area | | River/Stream (Perennial) | | Deep Groundwater Flow Direction |
| | Off-Post Evaluation Area | | River/Stream (Intermittent) | | Surface Water Flow Direction |

ATTACHMENT 1
Validated Analytical Data Table



Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			YTC-OFFP-01		YTC-OFFP-02		YTC-OFFP-03	
Sample/Parent ID			YTC-OFFP-01-DW-090821		YTC-OFFP-02-DW-090821		YTC-OFFP-03-DW-090921	
Sample Date			09/08/2021		09/08/2021		09/09/2021	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.0	U	1.7	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.8	U	6.8	U	7.5	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.0	U	1.7	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.0	U	1.7	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.0	U	1.7	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.0	U	1.7	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	62		13		3.8	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.0	U	1.7	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.0	U	1.7	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	43		6.1		0.61	J
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	450		63		5.1	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	160		21		1.9	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.7		1.3	J	1.9	U

Attachment 1 - Validated Analytical Data Tables
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Joint Base Lewis-McChord - Yakima Training Center, WA



Location			YTC-OFFP-01		YTC-OFFP-02		YTC-OFFP-03	
Sample/Parent ID			YTC-OFFP-01-DW-090821		YTC-OFFP-02-DW-090821		YTC-OFFP-03-DW-090921	
Sample Date			09/08/2021		09/08/2021		09/09/2021	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	460		60	J+	2.9	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	66		11		2.1	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.0	U	1.7	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.0	U	1.7	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.0	U	1.7	U	1.9	U

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Joint Base Lewis-McChord - Yakima Training Center, WA



Location			YTC-OFFP-04		YTC-OFFP-05		YTC-OFFP-06	
Sample/Parent ID			YTC-OFFP-04-DW-090821		YTC-OFFP-05-DW-090921		YTC-OFFP-06-DW-090721	
Sample Date			09/08/2021		09/09/2021		09/07/2021	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	9.6	U	1.9	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	38	U	7.5	U	6.9	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	9.6	U	1.9	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	9.6	U	1.9	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	9.6	U	1.9	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	9.6	U	1.9	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	22		150		35	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	9.6	U	1.9	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	9.6	U	1.9	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	7.2	J	66		1.1	J
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	83		1000		220	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	22		260		5.9	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	9.6	U	8.1		1.7	U

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			YTC-OFFP-04		YTC-OFFP-05		YTC-OFFP-06	
Sample/Parent ID			YTC-OFFP-04-DW-090821		YTC-OFFP-05-DW-090921		YTC-OFFP-06-DW-090721	
Sample Date			09/08/2021		09/09/2021		09/07/2021	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	24		1500		60	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	9.3	J	150		2.4	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	9.6	U	1.9	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	9.6	U	1.9	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	9.6	U	1.9	U	1.7	U

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			YTC-OFFP-07		YTC-OFFP-08		YTC-OFFP-09	
Sample/Parent ID			YTC-OFFD-07-DW-090821		YTC-OFFP-08-DW-090821		YTC-OFFP-09-DW-090821	
Sample Date			09/08/2021		09/08/2021		09/08/2021	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	1.9	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.4	U	7.7	U	7.3	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	1.9	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	1.9	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	1.9	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	1.9	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	15		170	J+	0.85	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	1.9	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	1.9	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	9.5		51		1.1	J
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	160	J+	1200	J+	3.3	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	13		240	J+	1.2	J
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.0		7.9		1.8	U

Attachment 1 - Validated Analytical Data Tables
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Joint Base Lewis-McChord - Yakima Training Center, WA



Location			YTC-OFFP-07		YTC-OFFP-08		YTC-OFFP-09	
Sample/Parent ID			YTC-OFFD-07-DW-090821		YTC-OFFP-08-DW-090821		YTC-OFFP-09-DW-090821	
Sample Date			09/08/2021		09/08/2021		09/08/2021	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	210	J+	1100	J+	2.4	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	11		120	J+	1.2	J
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	1.9	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	1.9	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	1.9	U	1.8	U

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			YTC-OFFP-10		YTC-OFFP-11		YTC-OFFP-12	
Sample/Parent ID			YTC-OFFP-10-DW-090721		YTC-OFFP-11-DW-090821		YTC-OFFP-12-DW-090921	
Sample Date			09/07/2021		09/08/2021		09/09/2021	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.9	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	6.9	U	7.6	U	7.5	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.9	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.9	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.9	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.9	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	5.9		5.2		9.3	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.9	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.9	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	0.83	J	1.7	J	12	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	59		26		59	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.6		7.6		22	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.9	U	1.1	J

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			YTC-OFFP-10		YTC-OFFP-11		YTC-OFFP-12	
Sample/Parent ID			YTC-OFFP-10-DW-090721		YTC-OFFP-11-DW-090821		YTC-OFFP-12-DW-090921	
Sample Date			09/07/2021		09/08/2021		09/09/2021	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	37		11		49	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.9		1.7	J	15	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.9	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.9	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.9	U	1.9	U

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			YTC-OFFP-13		YTC-OFFP-14		YTC-OFFP-15	
Sample/Parent ID			YTC-OFFP-13-DW-090721		YTC-OFFP-14-DW-090721		YTC-OFFP-15-DW-090721	
Sample Date			09/07/2021		09/07/2021		09/07/2021	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	6.7	U	7.2	U	7.0	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	6.7		16		54	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.4	J
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	7.3		1.8		45	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	82		160		530	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	14		9.1		130	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	0.89	J	1.8	U	3.9	

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			YTC-OFFP-13		YTC-OFFP-14		YTC-OFFP-15	
Sample/Parent ID			YTC-OFFP-13-DW-090721		YTC-OFFP-14-DW-090721		YTC-OFFP-15-DW-090721	
Sample Date			09/07/2021		09/07/2021		09/07/2021	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	65		14		560	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	9.3		1.9		58	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.7	U

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Location			YTC-OFFP-16		YTC-OFFP-17		YTC-OFFP-18	
Sample/Parent ID			YTC-OFFD-16-DW-090921		YTC-OFFP-17-DW-090821		YTC-OFFP-18-DW-090921	
Sample Date			09/09/2021		09/08/2021		09/09/2021	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	UJ	1.8	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.5	UJ	7.3	U	7.2	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	UJ	1.8	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	UJ	1.8	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	UJ	1.8	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	UJ	1.8	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.9	J-	2.1		18	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	UJ	1.8	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	UJ	1.8	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.6	J-	1.2	J	3.7	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	7.4	J-	11		230	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.8	J-	5.0		18	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9	UJ	1.8	U	1.8	U

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Location			YTC-OFFP-16		YTC-OFFP-17		YTC-OFFP-18	
Sample/Parent ID			YTC-OFFD-16-DW-090921		YTC-OFFP-17-DW-090821		YTC-OFFP-18-DW-090921	
Sample Date			09/09/2021		09/08/2021		09/09/2021	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	18	J-	8.9		200	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.3	J-	2.3		9	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	UJ	1.8	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	UJ	1.8	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	UJ	1.8	U	1.8	U

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Location			YTC-OFFP-19		YTC-OFFP-19		YTC-OFFP-20	
Sample/Parent ID			YTC-OFFP-19-DW-090821		YTC-FD-1-DW-090821 / YTC-OFFP-19-DW-090821		YTC-OFFP-20-DW-090921	
Sample Date			09/08/2021		09/08/2021		09/09/2021	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	UJ	1.9	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.1	UJ	7.5	U	7.4	UJ
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	UJ	1.9	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	UJ	1.9	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	UJ	1.9	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	UJ	1.9	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	J-	1.8	J	13	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	UJ	1.9	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	UJ	1.9	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	0.39	J-	0.38	J	2.9	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.1	J-	1.0	J	68	J-
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	0.77	J-	0.89	J	14	J-
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	UJ	1.9	U	1.9	U

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Location			YTC-OFFP-19		YTC-OFFP-19		YTC-OFFP-20	
Sample/Parent ID			YTC-OFFP-19-DW-090821		YTC-FD-1-DW-090821 / YTC-OFFP-19-DW-090821		YTC-OFFP-20-DW-090921	
Sample Date			09/08/2021		09/08/2021		09/09/2021	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.1	J-	0.94	J	28	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.3	J-	1.4	J	3.7	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	UJ	1.9	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	UJ	1.9	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	UJ	1.9	U	1.9	U

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Location			YTC-OFFP-21		YTC-PAIC-PRE		YTC-PAIC-PRE	
Sample/Parent ID			YTC-OFFP-21-DW-090921		YTC-PAIC-PRE-DW-090921		YTC-FD-2-DW-090921 / YTC-PAIC-PRE-DW-090921	
Sample Date			09/09/2021		09/09/2021		09/09/2021	
Sample Type			N		N		FD	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	1.8	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.7	U	7.2	U	7.5	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	1.8	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	1.8	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	1.8	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	1.8	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	10		1.8	U	1.9	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	1.8	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	1.8	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.3		1.8	U	1.9	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	52		1.8	U	1.9	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	11		1.8	U	1.9	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9	U	1.8	U	1.9	U

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Location			YTC-OFFP-21		YTC-PAIC-PRE		YTC-PAIC-PRE	
Sample/Parent ID			YTC-OFFP-21-DW-090921		YTC-PAIC-PRE-DW-090921		YTC-FD-2-DW-090921 / YTC-PAIC-PRE-DW-090921	
Sample Date			09/09/2021		09/09/2021		09/09/2021	
Sample Type			N		N		FD	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	29		1.8	U	1.9	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	3		1.8	U	1.9	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	1.8	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	1.8	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	1.8	U	1.9	U

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Location			YTC-OFFP-24		YTC-OFFP-25		YTC-OFFP-26	
Sample/Parent ID			YTC-OFFP-24-DW-011822		YTC-OFFP-25-DW-012222		YTC-OFFP-26-DW-011822	
Sample Date			01/18/2022		01/22/2022		01/18/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.0	U	2.0	U	2.3	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.9	U	8.1	U	9.3	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.0	U	2.0	U	2.3	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.0	U	2.0	U	2.3	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.0	U	2.0	U	2.3	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.0	U	2.0	U	2.3	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	6.5		9.0		2.3	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.0	U	2.0	U	2.3	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.0	U	2.0	U	2.3	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.3	J	2.0		2.3	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	38		55		2.0	J
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	8.3		11		2.3	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.0	U	2.0	U	2.3	U

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Location			YTC-OFFP-24		YTC-OFFP-25		YTC-OFFP-26	
Sample/Parent ID			YTC-OFFP-24-DW-011822		YTC-OFFP-25-DW-012222		YTC-OFFP-26-DW-011822	
Sample Date			01/18/2022		01/22/2022		01/18/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	20		26		1.7	J
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.1		2.5		2.3	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.0	U	2.0	U	2.3	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.0	U	2.0	U	2.3	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.0	U	2.0	U	2.3	U

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Location			YTC-OFFP-27		YTC-OFFP-28		YTC-OFFP-29	
Sample/Parent ID			YTC-OFFP-27-DW-011822		YTC-OFFP-28-DW-011822		YTC-OFFP-29-DW-012222	
Sample Date			01/18/2022		01/18/2022		01/21/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	UJ	1.9	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.8	UJ	7.4	U	7.4	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	UJ	1.9	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	UJ	1.9	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	UJ	1.9	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	UJ	1.9	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	9.0	J	2.1		5.3	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	UJ	1.9	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	UJ	1.9	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.9	J	1.9	U	1.0	J
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	52	J	8.4		28	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	11	J	1.4	J	6.2	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9	UJ	1.9	U	1.8	U

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Location			YTC-OFFP-27		YTC-OFFP-28		YTC-OFFP-29	
Sample/Parent ID			YTC-OFFP-27-DW-011822		YTC-OFFP-28-DW-011822		YTC-OFFP-29-DW-012222	
Sample Date			01/18/2022		01/18/2022		01/21/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	28	J	4.1		15	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.7	J	1.9	U	1.6	J
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	UJ	1.9	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	UJ	1.9	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	UJ	1.9	U	1.8	U

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Location			YTC-OFFP-30		YTC-OFFP-31		YTC-OFFP-32	
Sample/Parent ID			YTC-OFFP-30-DW-011922		YTC-OFFP-31-DW-011922		YTC-OFFP-32-DW-011922	
Sample Date			01/19/2022		01/19/2022		01/19/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.0	U	1.9	U	1.9	UJ
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.9	U	7.8	U	7.7	UJ
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.0	U	1.9	U	1.9	UJ
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.0	U	1.9	U	1.9	UJ
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.0	U	1.9	U	1.9	UJ
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.0	U	1.9	U	1.9	UJ
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	5.7		28		120	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.0	U	1.9	U	1.9	UJ
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.0	U	1.9	U	1.9	UJ
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	J	16		46	J-
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	36		220		710	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	7.6		54		240	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.0	U	1.9	U	1.9	J-

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Location			YTC-OFFP-30		YTC-OFFP-31		YTC-OFFP-32	
Sample/Parent ID			YTC-OFFP-30-DW-011922		YTC-OFFP-31-DW-011922		YTC-OFFP-32-DW-011922	
Sample Date			01/19/2022		01/19/2022		01/19/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	16		180		770	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.9	J	17		66	J-
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.0	U	1.9	U	1.9	UJ
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.0	U	1.9	U	1.9	UJ
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.0	U	1.9	U	1.9	UJ

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Location			YTC-OFFP-33		YTC-OFFP-34		YTC-OFFP-35	
Sample/Parent ID			YTC-OFFP-33-DW-011922		YTC-OFFP-34-DW-011922		YTC-OFFP-35-DW-011922	
Sample Date			01/19/2022		01/19/2022		01/19/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	2.0	U	2.0	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.2	U	8.2	U	7.9	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	2.0	U	2.0	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	2.0	U	2.0	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	2.5		2.0	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	2.0	U	2.0	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	2.0	U	2.0	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	2.0	U	2.0	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	2.0	U	2.0	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	2.0	U	2.0	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	U	2.0	U	2.0	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	2.0	U	2.0	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	2.0	U	2.0	U

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Location			YTC-OFFP-33		YTC-OFFP-34		YTC-OFFP-35	
Sample/Parent ID			YTC-OFFP-33-DW-011922		YTC-OFFP-34-DW-011922		YTC-OFFP-35-DW-011922	
Sample Date			01/19/2022		01/19/2022		01/19/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	2	U	2	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	2	U	2	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	2.0	U	2.0	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	2.0	U	2.0	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	2.0	U	2.0	U

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Location			YTC-OFFP-36		YTC-OFFP-37		YTC-OFFP-38	
Sample/Parent ID			YTC-OFFP-36-DW-011922		YTC-OFFP-37-DW-011922		YTC-OFFP-38-DW-011922	
Sample Date			01/19/2022		01/19/2022		01/19/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.1	U	2.0	U	2.0	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.3	U	7.9	U	8.1	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.1	U	2.0	U	2.0	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.1	U	2.0	U	2.0	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.1	U	2.0	U	2.0	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.1	U	2.0	U	2.0	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.1	U	1.3	J	21	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.1	U	2.0	U	2.0	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.1	U	2.0	U	2.0	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.1	U	2.0	U	13	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	2.1	U	6.8		150	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.1	U	3.0		43	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.1	U	2.0	U	2.0	U

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Location			YTC-OFFP-36		YTC-OFFP-37		YTC-OFFP-38	
Sample/Parent ID			YTC-OFFP-36-DW-011922		YTC-OFFP-37-DW-011922		YTC-OFFP-38-DW-011922	
Sample Date			01/19/2022		01/19/2022		01/19/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2.1	U	2.9		150	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.1	U	1.8	J	16	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.1	U	2.0	U	2.0	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.1	U	2.0	U	2.0	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.1	U	2.0	U	2.0	U

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Location			YTC-OFFP-39		YTC-OFFP-39		YTC-OFFP-40	
Sample/Parent ID			YTC-OFFP-39-DW-011922		YTC-FD-01-DW-011922 / YTC-OFFP-39-DW-011922		YTC-OFFP-40-DW-011922	
Sample Date			01/19/2022		01/19/2022		01/19/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.1	UJ	1.9	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.3	UJ	7.6	U	7.1	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.1	UJ	1.9	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.1	UJ	1.9	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.1	UJ	1.9	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.1	UJ	1.9	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	5.8	J-	5.9		4.6	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.1	UJ	1.9	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.1	UJ	1.9	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	3.3	J-	3.5		2.3	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	36	J-	36		27	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	11	J-	12		7.6	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.1	UJ	1.9	U	1.8	U

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Location			YTC-OFFP-39		YTC-OFFP-39		YTC-OFFP-40	
Sample/Parent ID			YTC-OFFP-39-DW-011922		YTC-FD-01-DW-011922 / YTC-OFFP-39-DW-011922		YTC-OFFP-40-DW-011922	
Sample Date			01/19/2022		01/19/2022		01/19/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	31	J-	32		20	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	3.8	J-	3.7		2.7	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.1	UJ	1.9	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.1	UJ	1.9	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.1	UJ	1.9	U	1.8	U

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Location			YTC-OFFP-41		YTC-OFFP-42		YTC-OFFP-43	
Sample/Parent ID			YTC-OFFP-41-DW-011922		YTC-OFFP-42-DW-011922		YTC-OFFP-43-DW-012722	
Sample Date			01/19/2022		01/19/2022		01/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	1.9	U	2.0	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.7	U	7.5	U	8.0	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	1.9	U	2.0	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	1.9	U	2.0	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	1.9	U	2.0	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	1.9	U	2.0	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	3.1		79		2.0	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	1.9	U	2.0	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	1.9	U	2.0	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.1		36		2.0	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	18		540		2.0	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	6.4		170		2.0	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9	U	2.3		2.0	U

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Location			YTC-OFFP-41		YTC-OFFP-42		YTC-OFFP-43	
Sample/Parent ID			YTC-OFFP-41-DW-011922		YTC-OFFP-42-DW-011922		YTC-OFFP-43-DW-012722	
Sample Date			01/19/2022		01/19/2022		01/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	12		540		2	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	3.9		62		2	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	1.9	U	2.0	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	1.9	U	2.0	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	1.9	U	2.0	U

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Location			YTC-OFFP-44		YTC-OFFP-45		YTC-OFFP-46	
Sample/Parent ID			YTC-OFFP-44-DW-012022		YTC-OFFP-45-DW-072622		YTC-OFFP-46-DW-012622	
Sample Date			01/20/2022		07/26/2022		01/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.0	U	1.7	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.0	U	1.7	U	7.5	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.0	U	1.7	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.0	U	1.7	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.0	U	1.7	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.0	U	1.7	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.0	U	1.7	U	1.6	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.0	U	1.7	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.0	U	1.7	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.0	U	1.7	U	1.9	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	2.0	U	1.7	U	5.9	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.0	U	1.7	U	1.9	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.0	U	1.7	U	1.9	U

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Location			YTC-OFFP-44		YTC-OFFP-45		YTC-OFFP-46	
Sample/Parent ID			YTC-OFFP-44-DW-012022		YTC-OFFP-45-DW-072622		YTC-OFFP-46-DW-012622	
Sample Date			01/20/2022		07/26/2022		01/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2	U	1.7	U	1.9	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2	U	1.7	U	1.9	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.0	U	1.7	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.0	U	1.7	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.0	U	1.7	U	1.9	U

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Location			YTC-OFFP-47		YTC-OFFP-48		YTC-OFFP-49	
Sample/Parent ID			YTC-OFFP-47-DW-012022		YTC-OFFP-48-DW-012022		YTC-OFFP-49-DW-012022	
Sample Date			01/20/2022		01/20/2022		01/20/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	1.8	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.8	U	7.2	U	7.5	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	1.8	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	1.8	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	1.8	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	1.8	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.9	U	1.6	J	2.4	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	1.8	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	1.8	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.9	U	1.8	U	1.9	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.9	U	4.9		8.3	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.9	U	1.8	U	1.2	J
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9	U	1.8	U	1.9	U

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Location			YTC-OFFP-47		YTC-OFFP-48		YTC-OFFP-49	
Sample/Parent ID			YTC-OFFP-47-DW-012022		YTC-OFFP-48-DW-012022		YTC-OFFP-49-DW-012022	
Sample Date			01/20/2022		01/20/2022		01/20/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.9	U	1.8	U	1.9	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.9	U	1.8	U	1.9	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	1.8	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	1.8	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	1.8	U	1.9	U

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Location			YTC-OFFP-51		YTC-OFFP-52		YTC-OFFP-53	
Sample/Parent ID			YTC-OFFP-51-DW-012722		YTC-OFFP-52-DW-012022		YTC-OFFP-53-DW-012022	
Sample Date			01/27/2022		01/20/2022		01/20/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	2.0	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.3	U	8.1	U	7.5	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	2.0	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	2.0	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	2.0	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	2.0	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	15		12		1.3	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	2.0	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	2.0	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	9.7		7.4		1.9	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	89		66		5.0	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	31		25		1.5	J
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	2.0	U	1.9	U

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Location			YTC-OFFP-51		YTC-OFFP-52		YTC-OFFP-53	
Sample/Parent ID			YTC-OFFP-51-DW-012722		YTC-OFFP-52-DW-012022		YTC-OFFP-53-DW-012022	
Sample Date			01/27/2022		01/20/2022		01/20/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	73		47		0.96	J
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	14		11		1.9	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	2.0	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	2.0	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	2.0	U	1.9	U

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Location			YTC-OFFP-54		YTC-OFFP-54		YTC-OFFP-55	
Sample/Parent ID			YTC-OFFP-54-DW-012022		YTC-FD-02-DW-012022 / YTC-OFFP-54-DW-012022		YTC-OFFP-55-DW-012122	
Sample Date			01/20/2022		01/20/2022		01/21/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.0	U	2.0	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.8	U	8.2	U	7.3	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.0	U	2.0	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.0	U	2.0	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.0	U	2.0	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.0	U	2.0	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.0	U	2.0	U	75	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.0	U	2.0	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.0	U	2.0	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.0	U	2.0	U	41	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.6	J	1.6	J	570	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.0	U	2.0	U	170	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.0	U	2.0	U	3.2	

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Location			YTC-OFFP-54		YTC-OFFP-54		YTC-OFFP-55	
Sample/Parent ID			YTC-OFFP-54-DW-012022		YTC-FD-02-DW-012022 / YTC-OFFP-54-DW-012022		YTC-OFFP-55-DW-012122	
Sample Date			01/20/2022		01/20/2022		01/21/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2	U	2	U	510	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2	U	2	U	72	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.0	U	2.0	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.0	U	2.0	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.0	U	2.0	U	1.8	U

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Location			YTC-OFFP-56		YTC-OFFP-57		YTC-OFFP-59	
Sample/Parent ID			YTC-OFFP-56-DW-012122		YTC-OFFP-57-DW-012022		YTC-OFFP-59-DW-012122	
Sample Date			01/21/2022		01/20/2022		01/21/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.2	U	1.9	U	2.0	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	9.0	U	7.5	U	8.0	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.2	U	1.9	U	2.0	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.2	U	1.9	U	2.0	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.2	U	1.9	U	2.0	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.2	U	1.9	U	2.0	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	73		2.0		54	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.2	U	1.9	U	2.0	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.2	U	1.9	U	2.0	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	41		1.9	U	25	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	510		7.5		430	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	150		2.5		94	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.6		1.9	U	4.2	

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Location			YTC-OFFP-56		YTC-OFFP-57		YTC-OFFP-59	
Sample/Parent ID			YTC-OFFP-56-DW-012122		YTC-OFFP-57-DW-012022		YTC-OFFP-59-DW-012122	
Sample Date			01/21/2022		01/20/2022		01/21/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	410		2.5		350	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	61		1.7	J	59	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.2	U	1.9	U	2.0	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.2	U	1.9	U	2.0	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.2	U	1.9	U	2.0	U

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Location			YTC-OFFP-60		YTC-OFFP-61		YTC-OFFP-62	
Sample/Parent ID			YTC-OFFP-60-DW-012122		YTC-OFFP-61-DW-012122		YTC-OFFP-62-DW-012122	
Sample Date			01/21/2022		01/21/2022		01/21/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	2.0	U	2.1	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.8	U	8.0	U	8.3	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	2.0	U	2.1	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	2.0	U	2.1	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	2.0	U	2.1	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	2.0	U	2.1	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	55		21		120	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	2.0	U	2.1	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	2.0	U	2.1	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	34		11		47	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	430		140		1000	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	110		32		210	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	3.5	J-	1.4	J	8.2	

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Location			YTC-OFFP-60		YTC-OFFP-61		YTC-OFFP-62	
Sample/Parent ID			YTC-OFFP-60-DW-012122		YTC-OFFP-61-DW-012122		YTC-OFFP-62-DW-012122	
Sample Date			01/21/2022		01/21/2022		01/21/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	320		86		740	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	76		17		130	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	2.0	U	2.1	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	UJ	2.0	U	2.1	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	2.0	U	2.1	U

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Location			YTC-OFFP-63		YTC-OFFP-64		YTC-OFFP-65	
Sample/Parent ID			YTC-OFFP-63-DW-012122		YTC-OFFP-64-DW-012122		YTC-OFFP-65-DW-012122	
Sample Date			01/21/2022		01/21/2022		01/21/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.0	U	1.8	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.9	U	7.1	U	7.2	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.0	U	1.8	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.0	U	1.8	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.0	U	1.8	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.0	U	1.8	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	65		3.6		74	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.0	U	1.8	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.0	U	1.8	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	26		0.91	J	43	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	460		10		580	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	120		2.4		140	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	5.5		1.8	U	5.7	

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Location			YTC-OFFP-63		YTC-OFFP-64		YTC-OFFP-65	
Sample/Parent ID			YTC-OFFP-63-DW-012122		YTC-OFFP-64-DW-012122		YTC-OFFP-65-DW-012122	
Sample Date			01/21/2022		01/21/2022		01/21/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	330		1.8	U	390	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	60		1.8	U	92	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.0	U	1.8	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.0	U	1.8	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.0	U	1.8	U	1.8	U

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Location			YTC-OFFP-66		YTC-OFFP-67		YTC-OFFP-70	
Sample/Parent ID			YTC-OFFP-66-DW-012122		YTC-OFFP-67-DW-012122		YTC-OFFP-70-DW-012122	
Sample Date			01/21/2022		01/21/2022		01/21/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	2.0	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.6	U	8.1	U	7.4	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	2.0	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	2.0	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	2.0	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	2.0	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	110		28		58	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	2.0	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	2.0	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	44		17		31	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	960		180		410	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	200		56		130	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	8.1		1.1	J	2.6	

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Location			YTC-OFFP-66		YTC-OFFP-67		YTC-OFFP-70	
Sample/Parent ID			YTC-OFFP-66-DW-012122		YTC-OFFP-67-DW-012122		YTC-OFFP-70-DW-012122	
Sample Date			01/21/2022		01/21/2022		01/21/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	800		140		330	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	120		29		60	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	2.0	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	2.0	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	2.0	U	1.9	U

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Location			YTC-OFFP-71		YTC-OFFP-72		YTC-OFFP-73	
Sample/Parent ID			YTC-OFFP-71-DW-012122		YTC-OFFP-72-DW-012422		YTC-OFFP-73-DW-012422	
Sample Date			01/21/2022		01/24/2022		01/24/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.1	U	1.8	U	2.0	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.2	U	7.2	U	7.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.1	U	1.8	U	2.0	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.1	U	1.8	U	2.0	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.1	U	1.8	U	2.0	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.1	U	1.8	U	2.0	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	8.4		45		71	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.1	U	1.8	U	2.0	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.1	U	1.8	U	2.0	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	3.4		17		27	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	23		340		530	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	11		59		110	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.1	U	2.8		5.7	

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Location			YTC-OFFP-71		YTC-OFFP-72		YTC-OFFP-73	
Sample/Parent ID			YTC-OFFP-71-DW-012122		YTC-OFFP-72-DW-012422		YTC-OFFP-73-DW-012422	
Sample Date			01/21/2022		01/24/2022		01/24/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	12		240		410	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	5.7		33		63	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.1	U	1.8	U	2.0	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.1	U	1.8	U	2.0	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.1	U	1.8	U	2.0	U

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Location			YTC-OFFP-74		YTC-OFFP-76		YTC-OFFP-77	
Sample/Parent ID			YTC-OFFP-74-DW-012422		YTC-OFFP-76-DW-012422		YTC-OFFP-77-DW-012422	
Sample Date			01/24/2022		01/24/2022		01/24/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	2.0	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.3	U	7.9	U	7.0	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	2.0	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	2.0	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	2.0	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	2.0	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	36		23		56	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	2.0	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	2.0	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	13		7.4		20	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	270		78		430	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	44		23		72	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.2		2.0	U	3.8	

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Location			YTC-OFFP-74		YTC-OFFP-76		YTC-OFFP-77	
Sample/Parent ID			YTC-OFFP-74-DW-012422		YTC-OFFP-76-DW-012422		YTC-OFFP-77-DW-012422	
Sample Date			01/24/2022		01/24/2022		01/24/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	200		11		380	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	22		10		36	J+
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	2.0	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	2.0	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	2.0	U	1.8	U

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Location			YTC-OFFP-77		YTC-OFFP-78		YTC-OFFP-79	
Sample/Parent ID			YTC-FD-03-DW-012422 / YTC-OFFP-77-DW-012422		YTC-OFFP-78-DW-012422		YTC-OFFP-79-DW-012422	
Sample Date			01/24/2022		01/24/2022		01/24/2022	
Sample Type			FD		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.0	U	2.0	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.2	U	8.0	U	7.6	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.0	U	2.0	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.0	U	2.0	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.0	U	2.0	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.0	U	2.0	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	55		18		12	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.0	U	2.0	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.0	U	2.0	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	21		4.0		3.7	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	400		53		42	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	71		15		14	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	3.8		2.0	U	1.9	U

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Location			YTC-OFFP-77		YTC-OFFP-78		YTC-OFFP-79	
Sample/Parent ID			YTC-FD-03-DW-012422 / YTC-OFFP-77-DW-012422		YTC-OFFP-78-DW-012422		YTC-OFFP-79-DW-012422	
Sample Date			01/24/2022		01/24/2022		01/24/2022	
Sample Type			FD		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	370		15		17	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	35		7		5.1	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.0	U	2.0	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.0	U	2.0	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.0	U	2.0	U	1.9	U

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Location			YTC-OFFP-80		YTC-OFFP-81		YTC-OFFP-82-DW	
Sample/Parent ID			YTC-OFFP-80-DW-012422		YTC-OFFP-81-DW-012422		YTC-OFFP-82-DW-080322	
Sample Date			01/24/2022		01/24/2022		08/03/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.1	U	1.8	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.2	U	7.3	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.1	U	1.8	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.1	U	1.8	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.1	U	1.8	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.1	U	1.8	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	15		85		47	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.1	U	1.8	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.1	U	1.8	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	4.7		29		21	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	54		650		340	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	14		120		65	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.1	U	5.6		4.4	

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Location			YTC-OFFP-80		YTC-OFFP-81		YTC-OFFP-82-DW	
Sample/Parent ID			YTC-OFFP-80-DW-012422		YTC-OFFP-81-DW-012422		YTC-OFFP-82-DW-080322	
Sample Date			01/24/2022		01/24/2022		08/03/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	27		500		340	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	9.7		63		35	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.1	U	1.8	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.1	U	1.8	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.1	U	1.8	U	1.8	U

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Location			YTC-OFFP-83		YTC-OFFP-84		YTC-OFFP-85	
Sample/Parent ID			YTC-OFFP-83-DW-012422		YTC-OFFP-84-DW-012422		YTC-OFFP-85-DW-012422	
Sample Date			01/24/2022		01/24/2022		01/24/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.0	U	2.2	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.9	U	8.6	U	7.4	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.0	U	2.2	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.0	U	2.2	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.0	U	2.2	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.0	U	2.2	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	80		19		57	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.0	U	2.2	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.0	U	2.2	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	26		8.5		22	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	570		110		410	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	120		25		80	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	5.1		1.1	J	4.2	

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Location			YTC-OFFP-83		YTC-OFFP-84		YTC-OFFP-85	
Sample/Parent ID			YTC-OFFP-83-DW-012422		YTC-OFFP-84-DW-012422		YTC-OFFP-85-DW-012422	
Sample Date			01/24/2022		01/24/2022		01/24/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	440		74		390	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	54		15		45	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.0	U	2.2	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.0	U	2.2	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.0	U	2.2	U	1.8	U

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Location			YTC-OFFP-86		YTC-OFFP-86		YTC-OFFP-88	
Sample/Parent ID			YTC-OFFP-86-DW-012422		YTC-OFFP-86-DW-080522		YTC-OFFP-88-DW-012422	
Sample Date			01/24/2022		08/05/2022		01/24/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.0	U	1.8	U	2.0	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.8	U	1.8	U	7.9	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.0	U	1.8	U	2.0	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.0	U	1.8	U	2.0	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.0	U	1.8	U	2.0	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.0	U	1.8	U	2.0	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	22		27		41	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.0	U	1.8	U	2.0	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.0	U	1.8	U	2.0	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	6.9		9.6		15	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	83	J-	110		370	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	25		32		52	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.0	U	1.3	J	2.9	

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Location			YTC-OFFP-86		YTC-OFFP-86		YTC-OFFP-88	
Sample/Parent ID			YTC-OFFP-86-DW-012422		YTC-OFFP-86-DW-080522		YTC-OFFP-88-DW-012422	
Sample Date			01/24/2022		08/05/2022		01/24/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	54		72		330	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	12		14		26	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.0	U	1.8	U	2.0	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.0	U	1.8	U	2.0	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.0	U	1.8	U	2.0	U

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Location			YTC-OFFP-89		YTC-OFFP-90		YTC-OFFP-91	
Sample/Parent ID			YTC-OFFP-89-DW-012422		YTC-OFFP-90-DW-012522		YTC-OFFP-91-DW-012522	
Sample Date			01/24/2022		01/25/2022		01/25/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.1	U	2.1	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.4	U	8.4	U	7.2	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.1	U	2.1	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.1	U	2.1	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.1	U	2.1	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.1	U	2.1	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	9.1		2.1	U	31	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.1	U	2.1	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.1	U	2.1	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.9		2.1	U	15	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	31		2.1	U	270	J+
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	11		2.1	U	36	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.1	U	2.1	U	2.6	

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Location			YTC-OFFP-89		YTC-OFFP-90		YTC-OFFP-91	
Sample/Parent ID			YTC-OFFP-89-DW-012422		YTC-OFFP-90-DW-012522		YTC-OFFP-91-DW-012522	
Sample Date			01/24/2022		01/25/2022		01/25/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	9.4		2.1	U	310	J+
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	4.1		2.1	U	22	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.1	U	2.1	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.1	U	2.1	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.1	U	2.1	U	1.8	U

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Location			YTC-OFFP-92		YTC-OFFP-93		YTC-OFFP-94	
Sample/Parent ID			YTC-OFFP-92-DW-012522		YTC-OFFP-93-DW-012522		YTC-OFFP-94-DW-012622	
Sample Date			01/25/2022		01/25/2022		01/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.0	U	2.0	U	2.0	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.1	U	8.1	U	7.9	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.0	U	2.0	U	2.0	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.0	U	2.0	U	2.0	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.0	U	2.0	U	2.0	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.0	U	2.0	U	2.0	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	16		16		2.0	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.0	U	2.0	U	2.0	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.0	U	2.0	U	2.0	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	5.5		4.4		2.0	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	100		55		2.0	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	17		17		2.0	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.0	U	2.0	U	2.0	U

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Location			YTC-OFFP-92		YTC-OFFP-93		YTC-OFFP-94	
Sample/Parent ID			YTC-OFFP-92-DW-012522		YTC-OFFP-93-DW-012522		YTC-OFFP-94-DW-012622	
Sample Date			01/25/2022		01/25/2022		01/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	74		16		2	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	10		7.4		2	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.0	U	2.0	U	2.0	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.0	U	2.0	U	2.0	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.0	U	2.0	U	2.0	U

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Location			YTC-OFFP-95		YTC-OFFP-96		YTC-OFFP-97	
Sample/Parent ID			YTC-OFFP-95-DW-012522		YTC-OFFP-96-DW-012522		YTC-OFFP-97-DW-012522	
Sample Date			01/25/2022		01/25/2022		01/25/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	1.7	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.6	U	7.0	U	7.2	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	1.7	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	1.7	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	1.7	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	1.7	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	24		1.7	U	1.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	1.7	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	1.7	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	7.5		1.6	J	1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	73	J+	1.6	J	1.3	J
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	33		3.9		1.8	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9	U	1.7	U	1.8	U

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Location			YTC-OFFP-95		YTC-OFFP-96		YTC-OFFP-97	
Sample/Parent ID			YTC-OFFP-95-DW-012522		YTC-OFFP-96-DW-012522		YTC-OFFP-97-DW-012522	
Sample Date			01/25/2022		01/25/2022		01/25/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	43		2.2	J	1.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	13		4.3		0.96	J
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	1.7	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	1.7	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	1.7	U	1.8	U

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Location			YTC-OFFP-99		YTC-OFFP-100		YTC-OFFP-101	
Sample/Parent ID			YTC-OFFP-99-DW-012522		YTC-OFFP-100-DW-012522		YTC-OFFP-101-DW-012522	
Sample Date			01/25/2022		01/25/2022		01/25/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	2.1	U	2.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.8	U	8.2	U	11	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	2.1	U	2.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	2.1	U	2.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	2.1	U	2.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	2.1	U	2.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	14		30		19	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	2.1	U	2.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	2.1	U	2.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	5.8		11		5.2	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	100		180		120	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	15		37		28	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.0	J	2.0	J	2.8	U

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Location			YTC-OFFP-99		YTC-OFFP-100		YTC-OFFP-101	
Sample/Parent ID			YTC-OFFP-99-DW-012522		YTC-OFFP-100-DW-012522		YTC-OFFP-101-DW-012522	
Sample Date			01/25/2022		01/25/2022		01/25/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	82		140		79	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	10		20		7.4	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	2.1	U	2.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	2.1	U	2.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	2.1	U	2.8	U

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Location			YTC-OFFP-102		YTC-OFFP-102		YTC-OFFP-103	
Sample/Parent ID			YTC-OFFP-102-DW-012522		YTC-OFFP-FD-04-012522 / YTC-OFFP-102-DW-012522		YTC-OFFP-103-DW-012522	
Sample Date			01/25/2022		01/25/2022		01/25/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.0	U	1.9	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.1	UJ	7.4	U	7.6	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.0	U	1.9	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.0	U	1.9	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.0	U	1.9	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.0	U	1.9	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	4.0	J-	3.8		1.8	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.0	U	1.9	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.0	U	1.9	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.0	U	1.9	U	1.9	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	2.6		2.8		1.9	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.0	UJ	1.9	U	1.9	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.0	U	1.9	U	1.9	U

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Location			YTC-OFFP-102		YTC-OFFP-102		YTC-OFFP-103	
Sample/Parent ID			YTC-OFFP-102-DW-012522		YTC-OFFP-FD-04-012522 / YTC-OFFP-102-DW-012522		YTC-OFFP-103-DW-012522	
Sample Date			01/25/2022		01/25/2022		01/25/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.2	J	1.2	J	1.9	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2	U	1.9	U	1.9	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.0	U	1.9	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.0	U	1.9	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.0	U	1.9	U	1.9	U

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Location			YTC-OFFP-104		YTC-OFFP-105		YTC-OFFP-106	
Sample/Parent ID			YTC-OFFP-104-DW-012522		YTC-OFFP-105-DW-012622		YTC-OFFP-106-DW-012622	
Sample Date			01/25/2022		01/26/2022		01/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.0	U	1.9	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.8	U	7.7	U	7.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.0	U	1.9	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.0	U	1.9	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.0	U	1.9	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.0	U	1.9	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.1		3.3		1.9	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.0	U	1.9	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.0	U	1.9	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.0	U	1.9	U	1.9	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.3	J	3.9		1.9	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.5	J	2.2		1.9	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.0	U	1.9	U	1.9	U

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Location			YTC-OFFP-104		YTC-OFFP-105		YTC-OFFP-106	
Sample/Parent ID			YTC-OFFP-104-DW-012522		YTC-OFFP-105-DW-012622		YTC-OFFP-106-DW-012622	
Sample Date			01/25/2022		01/26/2022		01/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2.4	J	1.9	U	1.9	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.4		1.9	U	1.9	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.0	U	1.9	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.0	U	1.9	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.0	U	1.9	U	1.9	U

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Location			YTC-OFFP-108		YTC-OFFP-110		YTC-OFFP-111	
Sample/Parent ID			YTC-OFFP-108-DW-012622		YTC-OFFP-110-DW-012622		YTC-OFFP-111-DW-012622	
Sample Date			01/26/2022		01/26/2022		01/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.9	U	2.0	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.4	U	7.5	U	8.1	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.9	U	2.0	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.9	U	2.0	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.9	U	2.0	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.9	U	2.0	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.4		3.7		7.0	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.9	U	2.0	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.9	U	2.0	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.9	U	2.0	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	U	1.9	U	1.1	J
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	1.9	U	3.3	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.9	U	2.0	U

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Location			YTC-OFFP-108		YTC-OFFP-110		YTC-OFFP-111	
Sample/Parent ID			YTC-OFFP-108-DW-012622		YTC-OFFP-110-DW-012622		YTC-OFFP-111-DW-012622	
Sample Date			01/26/2022		01/26/2022		01/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	1.9	U	2	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	1.9	U	2.4	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.9	U	2.0	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.9	U	2.0	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.9	U	2.0	U

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Location			YTC-OFFP-112		YTC-OFFP-113		YTC-OFFP-114	
Sample/Parent ID			YTC-OFFP-112-DW-012622		YTC-OFFP-113-DW-012622		YTC-OFFP-114-DW-012622	
Sample Date			01/26/2022		01/26/2022		01/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	2.0	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.4	U	8.0	U	7.6	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	2.0	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	2.0	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	2.0	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	2.0	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.9		2.0	U	1.9	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	2.0	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	2.0	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.9	U	2.0	U	1.9	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	4.4		2.0	U	1.9	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	3.0		2.0	U	1.9	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9	U	2.0	U	1.9	U

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Location			YTC-OFFP-112		YTC-OFFP-113		YTC-OFFP-114	
Sample/Parent ID			YTC-OFFP-112-DW-012622		YTC-OFFP-113-DW-012622		YTC-OFFP-114-DW-012622	
Sample Date			01/26/2022		01/26/2022		01/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.9	U	2	U	1.9	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.9	U	2	U	1.9	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	2.0	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	2.0	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	2.0	U	1.9	U

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Location			YTC-OFFP-115		YTC-OFFP-116		YTC-OFFP-117	
Sample/Parent ID			YTC-OFFP-115-DW-012722		YTC-OFFP-116-DW-012622		YTC-OFFP-117-DW-012622	
Sample Date			01/27/2022		01/26/2022		01/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	2.1	U	2.1	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.4	U	8.3	U	8.5	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	2.1	U	2.1	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	2.1	U	2.1	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	2.1	U	2.1	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	2.1	U	2.1	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	2.1	U	2.1	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	2.1	U	2.1	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	2.1	U	2.1	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	2.1	U	2.1	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	U	2.1	U	1.3	J
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	2.1	U	2.1	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	2.1	U	2.1	U

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Location			YTC-OFFP-115		YTC-OFFP-116		YTC-OFFP-117	
Sample/Parent ID			YTC-OFFP-115-DW-012722		YTC-OFFP-116-DW-012622		YTC-OFFP-117-DW-012622	
Sample Date			01/27/2022		01/26/2022		01/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	2.1	U	2.1	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	2.1	U	2.1	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	2.1	U	2.1	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	2.1	U	2.1	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	2.1	U	2.1	U

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Location			YTC-OFFP-118		YTC-OFFP-120		YTC-OFFP-120	
Sample/Parent ID			YTC-OFFP-118-DW-012622		YTC-OFFP-120-DW-012622		YTC-OFFP-FD-05-012622 / YTC-OFFP-120-DW-012622	
Sample Date			01/26/2022		01/26/2022		01/26/2022	
Sample Type			N		N		FD	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.2	U	1.9	U	2.0	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.9	U	7.6	U	8.0	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.2	U	1.9	U	2.0	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.2	U	1.9	U	2.0	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.2	U	1.9	U	2.0	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.2	U	1.9	U	2.0	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	6.1		1.9	U	2.0	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.2	U	1.9	U	2.0	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.2	U	1.9	U	2.0	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.1	J	1.9	U	2.0	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	12		1.9	U	2.0	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	8.4		1.9	U	2.0	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.2	U	1.9	U	2.0	U

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Location			YTC-OFFP-118		YTC-OFFP-120		YTC-OFFP-120	
Sample/Parent ID			YTC-OFFP-118-DW-012622		YTC-OFFP-120-DW-012622		YTC-OFFP-FD-05-012622 / YTC-OFFP-120-DW-012622	
Sample Date			01/26/2022		01/26/2022		01/26/2022	
Sample Type			N		N		FD	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	20		1.9	U	2	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	5		1.9	U	2	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.2	U	1.9	U	2.0	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.2	U	1.9	U	2.0	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.2	U	1.9	U	2.0	U

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Location			YTC-OFFP-121		YTC-OFFP-122		YTC-OFFP-123	
Sample/Parent ID			YTC-OFFP-121-DW-012722		YTC-OFFP-122-DW-072522		YTC-OFFP-123-DW-072522	
Sample Date			01/27/2022		07/25/2022		07/25/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.7	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.9	U	0.46	J	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.9	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.9	U	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.9	U	1.7	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9	U	1.7	U	1.7	U

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Location			YTC-OFFP-121		YTC-OFFP-122		YTC-OFFP-123	
Sample/Parent ID			YTC-OFFP-121-DW-012722		YTC-OFFP-122-DW-072522		YTC-OFFP-123-DW-072522	
Sample Date			01/27/2022		07/25/2022		07/25/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.9	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.9	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	1.7	U	1.7	U

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Location			YTC-OFFP-124		YTC-OFFP-124		YTC-OFFP-125	
Sample/Parent ID			YTC-OFFP-124-DW-072522		YTC-OFFP-FD-01-072522 / YTC-OFFP-124-DW-072522		YTC-OFFP-125-DW-072522	
Sample Date			07/25/2022		07/25/2022		07/25/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.7	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-124		YTC-OFFP-124		YTC-OFFP-125	
Sample/Parent ID			YTC-OFFP-124-DW-072522		YTC-OFFP-FD-01-072522 / YTC-OFFP-124-DW-072522		YTC-OFFP-125-DW-072522	
Sample Date			07/25/2022		07/25/2022		07/25/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-126		YTC-OFFP-127		YTC-OFFP-128	
Sample/Parent ID			YTC-OFFP-126-DW-072522		YTC-OFFP-127-DW-072522		YTC-OFFP-128-DW-072722	
Sample Date			07/25/2022		07/25/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	1.7	U	1.7	J+
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-126		YTC-OFFP-127		YTC-OFFP-128	
Sample/Parent ID			YTC-OFFP-126-DW-072522		YTC-OFFP-127-DW-072522		YTC-OFFP-128-DW-072722	
Sample Date			07/25/2022		07/25/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	1.7	U	1.7	UB
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-129		YTC-OFFP-130		YTC-OFFP-131	
Sample/Parent ID			YTC-OFFP-129-DW-072522		YTC-OFFP-130-DW-072522		YTC-OFFP-131-DW-080222	
Sample Date			07/25/2022		07/25/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.7	U	1.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.7	U	1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	0.50	J	1.7	U	1.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.7	U	1.8	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.8	U

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Location			YTC-OFFP-129		YTC-OFFP-130		YTC-OFFP-131	
Sample/Parent ID			YTC-OFFP-129-DW-072522		YTC-OFFP-130-DW-072522		YTC-OFFP-131-DW-080222	
Sample Date			07/25/2022		07/25/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.7	U	1.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.7	U	1.8	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.8	U

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Location			YTC-OFFP-132		YTC-OFFP-134		YTC-OFFP-136	
Sample/Parent ID			YTC-OFFP-132-DW-072522		YTC-OFFP-134-DW-072522		YTC-OFFP-136-DW-072622	
Sample Date			07/25/2022		07/25/2022		07/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.7	UJ
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.7	UJ
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.7	UJ
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.7	UJ
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.7	UJ
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.7	UJ
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.7	U	1.7	UJ
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.7	UJ
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.7	UJ
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.7	U	1.7	UJ
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	0.49	J	1.7	UJ
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.7	U	1.7	UJ
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.7	UJ

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Location			YTC-OFFP-132		YTC-OFFP-134		YTC-OFFP-136	
Sample/Parent ID			YTC-OFFP-132-DW-072522		YTC-OFFP-134-DW-072522		YTC-OFFP-136-DW-072622	
Sample Date			07/25/2022		07/25/2022		07/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.7	U	1.7	UJ
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.7	U	1.7	UJ
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.7	UJ
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.7	UJ
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.7	UJ

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Location			YTC-OFFP-137		YTC-OFFP-138		YTC-OFFP-139	
Sample/Parent ID			YTC-OFFP-137-DW-072622		YTC-OFFP-138-DW-072622		YTC-OFFP-139-DW-072622	
Sample Date			07/26/2022		07/26/2022		07/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	UJ	1.7	UJ	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	UJ	1.7	UJ	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	UJ	1.7	UJ	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	UJ	1.7	UJ	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	UJ	1.7	UJ	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	1.7	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-137		YTC-OFFP-138		YTC-OFFP-139	
Sample/Parent ID			YTC-OFFP-137-DW-072622		YTC-OFFP-138-DW-072622		YTC-OFFP-139-DW-072622	
Sample Date			07/26/2022		07/26/2022		07/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	UJ	1.7	UJ	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-140		YTC-OFFP-141		YTC-OFFP-142	
Sample/Parent ID			YTC-OFFP-140-DW-072622		YTC-OFFP-141-DW-072622		YTC-OFFP-142-DW-072622	
Sample Date			07/26/2022		07/26/2022		07/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	U	1.7	UJ
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	U	1.7	UJ
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	U	1.7	UJ
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.7	U	1.7	UJ
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	0.53	J	1.7	U	1.7	UJ
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	1.7	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-140		YTC-OFFP-141		YTC-OFFP-142	
Sample/Parent ID			YTC-OFFP-140-DW-072622		YTC-OFFP-141-DW-072622		YTC-OFFP-142-DW-072622	
Sample Date			07/26/2022		07/26/2022		07/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	1.7	U	1.7	UJ
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-143		YTC-OFFP-143		YTC-OFFP-144	
Sample/Parent ID			YTC-OFFP-143-DW-072622		YTC-OFFP-FD-02-072622 / YTC-OFFP-143-DW-072622		YTC-OFFP-144-DW-072622	
Sample Date			07/26/2022		07/26/2022		07/26/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	UJ	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	UJ	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	UJ	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.7	UJ	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	U	1.7	UJ	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	1.7	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-143		YTC-OFFP-143		YTC-OFFP-144	
Sample/Parent ID			YTC-OFFP-143-DW-072622		YTC-OFFP-FD-02-072622 / YTC-OFFP-143-DW-072622		YTC-OFFP-144-DW-072622	
Sample Date			07/26/2022		07/26/2022		07/26/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	1.7	UJ	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-145		YTC-OFFP-147		YTC-OFFP-148	
Sample/Parent ID			YTC-OFFP-145-DW-072622		YTC-OFFP-147-DW-072922		YTC-OFFP-148-DW-072722	
Sample Date			07/26/2022		07/29/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	UJ	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	UJ	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	UJ	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	UJ	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	0.45	J	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	0.44	J	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	0.56	J-	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.8		1.7	U	1.7	UB
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-145		YTC-OFFP-147		YTC-OFFP-148	
Sample/Parent ID			YTC-OFFP-145-DW-072622		YTC-OFFP-147-DW-072922		YTC-OFFP-148-DW-072722	
Sample Date			07/26/2022		07/29/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	3	J-	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.4		1.7	U	1.7	UB
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-149		YTC-OFFP-150		YTC-OFFP-151	
Sample/Parent ID			YTC-OFFP-149-DW-072622		YTC-OFFP-150-DW-072722		YTC-OFFP-151-DW-072722	
Sample Date			07/26/2022		07/27/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.9	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.6		1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	0.52	J	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	0.79	J	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	0.74	J	1.9	J+	1.7	UB
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9	U	1.7	U	1.7	U

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Location			YTC-OFFP-149		YTC-OFFP-150		YTC-OFFP-151	
Sample/Parent ID			YTC-OFFP-149-DW-072622		YTC-OFFP-150-DW-072722		YTC-OFFP-151-DW-072722	
Sample Date			07/26/2022		07/27/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	3.5		1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.5	J	1.7	UB	1.7	UB
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	1.7	U	1.7	U

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Location			YTC-OFFP-152		YTC-OFFP-153		YTC-OFFP-154	
Sample/Parent ID			YTC-OFFP-152-DW-072722		YTC-OFFP-153-DW-072722		YTC-OFFP-154-DW-072722	
Sample Date			07/27/2022		07/27/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	UJ	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	UJ	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	UJ	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	UJ	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	UJ	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	UJ	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.7	UJ	0.43	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	UJ	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	UJ	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.7	UJ	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.7	UJ	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	UB	3.4	J+	1.9	J+
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	UJ	1.7	U

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Location			YTC-OFFP-152		YTC-OFFP-153		YTC-OFFP-154	
Sample/Parent ID			YTC-OFFP-152-DW-072722		YTC-OFFP-153-DW-072722		YTC-OFFP-154-DW-072722	
Sample Date			07/27/2022		07/27/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.7	UJ	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	UB	1.7	UB	1.7	UB
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	UJ	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	UJ	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	UJ	1.7	U

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Location			YTC-OFFP-155		YTC-OFFP-156		YTC-OFFP-157	
Sample/Parent ID			YTC-OFFP-155-DW-072722		YTC-OFFP-156-DW-072722		YTC-OFFP-157-DW-072722	
Sample Date			07/27/2022		07/27/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.6	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.6	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.6	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.6	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.6	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.6	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.6	U	1.8	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.6	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.6	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.6	U	1.8	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.6	U	1.8	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.6	UB	1.8	J+	1.7	UB
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.6	U	1.8	U	1.7	U

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Location			YTC-OFFP-155		YTC-OFFP-156		YTC-OFFP-157	
Sample/Parent ID			YTC-OFFP-155-DW-072722		YTC-OFFP-156-DW-072722		YTC-OFFP-157-DW-072722	
Sample Date			07/27/2022		07/27/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.6	U	1.8	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.6	UB	1.8	UB	1.7	UB
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.6	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.6	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.6	U	1.8	U	1.7	U

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Location			YTC-OFFP-158		YTC-OFFP-159		YTC-OFFP-160	
Sample/Parent ID			YTC-OFFP-158-DW-072722		YTC-OFFP-159-DW-072722		YTC-OFFP-160-DW-080122	
Sample Date			07/27/2022		07/27/2022		08/01/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	UB	1.7	UB	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-158		YTC-OFFP-159		YTC-OFFP-160	
Sample/Parent ID			YTC-OFFP-158-DW-072722		YTC-OFFP-159-DW-072722		YTC-OFFP-160-DW-080122	
Sample Date			07/27/2022		07/27/2022		08/01/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	UB	1.7	UB	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-162		YTC-OFFP-163		YTC-OFFP-163	
Sample/Parent ID			YTC-OFFP-162-DW-072722		YTC-OFFP-163-DW-072722		YTC-OFFP-FD-03-DW-072722 / YTC-OFFP-163-DW-072722	
Sample Date			07/27/2022		07/27/2022		07/27/2022	
Sample Type			N		N		FD	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	UJ	1.7	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	UJ	1.7	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	UJ	1.7	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	UJ	1.7	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	UJ	1.7	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	UJ	1.7	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	UJ	0.90	J	0.82	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	UJ	1.7	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	UJ	1.7	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	UJ	1.7	U	1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	UJ	1.4	J	1.3	J
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	UB	1.9	J+	2.2	J+
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	UJ	1.7	U	1.8	U

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Location			YTC-OFFP-162		YTC-OFFP-163		YTC-OFFP-163	
Sample/Parent ID			YTC-OFFP-162-DW-072722		YTC-OFFP-163-DW-072722		YTC-OFFP-FD-03-DW-072722 / YTC-OFFP-163-DW-072722	
Sample Date			07/27/2022		07/27/2022		07/27/2022	
Sample Type			N		N		FD	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	UJ	0.49	J	0.47	J
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	UB	1.7	UB	1.8	UB
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	UJ	1.7	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	UJ	1.7	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	UJ	1.7	U	1.8	U

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Location			YTC-OFFP-164		YTC-OFFP-165		YTC-OFFP-166	
Sample/Parent ID			YTC-OFFP-164-DW-072722		YTC-OFFP-165-DW-072722		YTC-OFFP-166-DW-072722	
Sample Date			07/27/2022		07/27/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.3	J	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	4.1		1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	J+	1.7	J+	1.8	J+
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-164		YTC-OFFP-165		YTC-OFFP-166	
Sample/Parent ID			YTC-OFFP-164-DW-072722		YTC-OFFP-165-DW-072722		YTC-OFFP-166-DW-072722	
Sample Date			07/27/2022		07/27/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.2	J	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	UB	1.7	UB	1.7	UB
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-167		YTC-OFFP-168		YTC-OFFP-169	
Sample/Parent ID			YTC-OFFP-167-DW-072622		YTC-OFFP-168-DW-072822		YTC-OFFP-169-DW-072822	
Sample Date			07/26/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	0.46	J	0.58	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.7	U	1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.7	U	1.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.7	U	0.52	J
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.8	U

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Location			YTC-OFFP-167		YTC-OFFP-168		YTC-OFFP-169	
Sample/Parent ID			YTC-OFFP-167-DW-072622		YTC-OFFP-168-DW-072822		YTC-OFFP-169-DW-072822	
Sample Date			07/26/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.7	U	1.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.7	U	1.8	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.8	U

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Location			YTC-OFFP-170		YTC-OFFP-171		YTC-OFFP-172	
Sample/Parent ID			YTC-OFFP-170-DW-072822		YTC-OFFP-171-DW-072822		YTC-OFFP-172-DW-072822	
Sample Date			07/28/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.7	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-170		YTC-OFFP-171		YTC-OFFP-172	
Sample/Parent ID			YTC-OFFP-170-DW-072822		YTC-OFFP-171-DW-072822		YTC-OFFP-172-DW-072822	
Sample Date			07/28/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-173		YTC-OFFP-174		YTC-OFFP-175	
Sample/Parent ID			YTC-OFFP-173-DW-072822		YTC-OFFP-174-DW-072822		YTC-OFFP-175-DW-072822	
Sample Date			07/28/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.7	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-173		YTC-OFFP-174		YTC-OFFP-175	
Sample/Parent ID			YTC-OFFP-173-DW-072822		YTC-OFFP-174-DW-072822		YTC-OFFP-175-DW-072822	
Sample Date			07/28/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-176		YTC-OFFP-177		YTC-OFFP-178	
Sample/Parent ID			YTC-OFFP-176-DW-072822		YTC-OFFP-177-DW-072822		YTC-OFFP-178-DW-072822	
Sample Date			07/28/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.6	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.6	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.6	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.6	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.6	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.6	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.6	U	0.69	J	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.6	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.6	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.6	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.6	U	1.1	J	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.6	U	1.7	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.6	U	1.7	U	1.7	U

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Location			YTC-OFFP-176		YTC-OFFP-177		YTC-OFFP-178	
Sample/Parent ID			YTC-OFFP-176-DW-072822		YTC-OFFP-177-DW-072822		YTC-OFFP-178-DW-072822	
Sample Date			07/28/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.6	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.6	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.6	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.6	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.6	U	1.7	U	1.7	U

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Location			YTC-OFFP-179		YTC-OFFP-180		YTC-OFFP-181	
Sample/Parent ID			YTC-OFFP-179-DW-072822		YTC-OFFP-180-DW-072822		YTC-OFFP-181-DW-072822	
Sample Date			07/28/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	0.46	J	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.7	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-179		YTC-OFFP-180		YTC-OFFP-181	
Sample/Parent ID			YTC-OFFP-179-DW-072822		YTC-OFFP-180-DW-072822		YTC-OFFP-181-DW-072822	
Sample Date			07/28/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-182		YTC-OFFP-183		YTC-OFFP-183	
Sample/Parent ID			YTC-OFFP-182-DW-072822		YTC-OFFP-183-DW-072822		YTC-OFFP-FD-04-072822 / YTC-OFFP-183-DW-072822	
Sample Date			07/28/2022		07/28/2022		07/28/2022	
Sample Type			N		N		FD	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.7	U	1.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.7	U	1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.7	U	1.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.7	U	1.8	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.8	U

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Location			YTC-OFFP-182		YTC-OFFP-183		YTC-OFFP-183	
Sample/Parent ID			YTC-OFFP-182-DW-072822		YTC-OFFP-183-DW-072822		YTC-OFFP-FD-04-072822 / YTC-OFFP-183-DW-072822	
Sample Date			07/28/2022		07/28/2022		07/28/2022	
Sample Type			N		N		FD	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.7	U	1.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.7	U	1.8	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.8	U

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Location			YTC-OFFP-184		YTC-OFFP-185		YTC-OFFP-186	
Sample/Parent ID			YTC-OFFP-184-DW-072822		YTC-OFFP-185-DW-072822		YTC-OFFP-186-DW-072822	
Sample Date			07/28/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	0.64	J	1.1	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	U	0.64	J	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	1.7	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-184		YTC-OFFP-185		YTC-OFFP-186	
Sample/Parent ID			YTC-OFFP-184-DW-072822		YTC-OFFP-185-DW-072822		YTC-OFFP-186-DW-072822	
Sample Date			07/28/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-188		YTC-OFFP-189		YTC-OFFP-190	
Sample/Parent ID			YTC-OFFP-188-DW-072922		YTC-OFFP-189-DW-072922		YTC-OFFP-190-DW-072922	
Sample Date			07/29/2022		07/29/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.8	U	1.1	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.8	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.8	U	2.5	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.8	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.8	U	1.7	U

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Location			YTC-OFFP-188		YTC-OFFP-189		YTC-OFFP-190	
Sample/Parent ID			YTC-OFFP-188-DW-072922		YTC-OFFP-189-DW-072922		YTC-OFFP-190-DW-072922	
Sample Date			07/29/2022		07/29/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.8	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.8	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.7	U

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Location			YTC-OFFP-191		YTC-OFFP-192		YTC-OFFP-193	
Sample/Parent ID			YTC-OFFP-191-DW-072922		YTC-OFFP-192-DW-072922		YTC-OFFP-193-DW-072922	
Sample Date			07/29/2022		07/29/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	0.51	J	0.94	J	0.88	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.8	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	0.47	J	0.87	J	1.7	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	1.8	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.8	U	1.7	U

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Location			YTC-OFFP-191		YTC-OFFP-192		YTC-OFFP-193	
Sample/Parent ID			YTC-OFFP-191-DW-072922		YTC-OFFP-192-DW-072922		YTC-OFFP-193-DW-072922	
Sample Date			07/29/2022		07/29/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	1.8	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	1.8	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.8	U	1.7	U

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Location			YTC-OFFP-195		YTC-OFFP-196		YTC-OFFP-197	
Sample/Parent ID			YTC-OFFP-195-DW-072922		YTC-OFFP-196-DW-072922		YTC-OFFP-197-DW-072922	
Sample Date			07/29/2022		07/29/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	0.80	J	1.7	U	0.56	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.7	U	2.5	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.7	U	1.1	J
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-195		YTC-OFFP-196		YTC-OFFP-197	
Sample/Parent ID			YTC-OFFP-195-DW-072922		YTC-OFFP-196-DW-072922		YTC-OFFP-197-DW-072922	
Sample Date			07/29/2022		07/29/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.7	U	0.45	J
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.7	U	0.62	J
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-198		YTC-OFFP-199		YTC-OFFP-200	
Sample/Parent ID			YTC-OFFP-198-DW-072922		YTC-OFFP-199-DW-072922		YTC-OFFP-200-DW-072622	
Sample Date			07/29/2022		07/29/2022		07/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	1.6	U	1.6	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.9	U	1.6	U	1.6	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	1.6	U	1.6	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	1.6	U	1.6	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	1.6	U	1.6	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	1.6	U	1.6	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.9	U	1.6	U	0.72	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	1.6	U	1.6	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	1.6	U	1.6	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.9	U	1.6	U	1.6	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.9	U	1.6	U	3.6	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.9	U	1.6	U	1.6	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9	U	1.6	U	1.6	U

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Location			YTC-OFFP-198		YTC-OFFP-199		YTC-OFFP-200	
Sample/Parent ID			YTC-OFFP-198-DW-072922		YTC-OFFP-199-DW-072922		YTC-OFFP-200-DW-072622	
Sample Date			07/29/2022		07/29/2022		07/26/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.9	U	1.6	U	0.43	J
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.9	U	1.6	U	1.6	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	1.6	U	1.6	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	1.6	U	1.6	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	1.6	U	1.6	U

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Location			YTC-OFFP-201		YTC-OFFP-202		YTC-OFFP-203	
Sample/Parent ID			YTC-OFFP-201-DW-072922		YTC-OFFP-202-DW-080122		YTC-OFFP-203-DW-072922	
Sample Date			07/29/2022		08/01/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.1	J	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.8	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	0.60	J	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.8	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.8	U	1.7	U

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Location			YTC-OFFP-201		YTC-OFFP-202		YTC-OFFP-203	
Sample/Parent ID			YTC-OFFP-201-DW-072922		YTC-OFFP-202-DW-080122		YTC-OFFP-203-DW-072922	
Sample Date			07/29/2022		08/01/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.8	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.8	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.7	U

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Location			YTC-OFFP-203		YTC-OFFP-204		YTC-OFFP-205	
Sample/Parent ID			YTC-OFFP-FD-05-DW-072922 / YTC-OFFP-203-DW-072922		YTC-OFFP-204-DW-072822		YTC-OFFP-205-DW-072922	
Sample Date			07/29/2022		07/28/2022		07/29/2022	
Sample Type			FD		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	0.63	J	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	U	0.96	J	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	1.7	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-203		YTC-OFFP-204		YTC-OFFP-205	
Sample/Parent ID			YTC-OFFP-FD-05-DW-072922 / YTC-OFFP-203-DW-072922		YTC-OFFP-204-DW-072822		YTC-OFFP-205-DW-072922	
Sample Date			07/29/2022		07/28/2022		07/29/2022	
Sample Type			FD		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-206		YTC-OFFP-208		YTC-OFFP-209	
Sample/Parent ID			YTC-OFFP-206-DW-072922		YTC-OFFP-208-DW-072822		YTC-OFFP-209-DW-072822	
Sample Date			07/29/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.8	U	1.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.8	U	1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.8	U	1.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.8	U	1.8	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.8	U	1.8	U

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Location			YTC-OFFP-206		YTC-OFFP-208		YTC-OFFP-209	
Sample/Parent ID			YTC-OFFP-206-DW-072922		YTC-OFFP-208-DW-072822		YTC-OFFP-209-DW-072822	
Sample Date			07/29/2022		07/28/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.8	U	1.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.8	U	1.8	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.8	U

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Location			YTC-OFFP-210		YTC-OFFP-211		YTC-OFFP-213	
Sample/Parent ID			YTC-OFFP-210-DW-073022		YTC-OFFP-211-DW-072922		YTC-OFFP-213-DW-072822	
Sample Date			07/30/2022		07/29/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.6	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.6	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.6	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.6	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.6	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.6	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.3	J	1.6	U	14	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.6	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.6	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.6	U	6.9	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.5	J	1.6	U	98	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.6	U	16	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.6	U	0.99	J

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Location			YTC-OFFP-210		YTC-OFFP-211		YTC-OFFP-213	
Sample/Parent ID			YTC-OFFP-210-DW-073022		YTC-OFFP-211-DW-072922		YTC-OFFP-213-DW-072822	
Sample Date			07/30/2022		07/29/2022		07/28/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	0.74	J	1.6	U	87	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.6	U	11	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.6	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.6	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.6	U	1.7	U

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Location			YTC-OFFP-214		YTC-OFFP-215		YTC-OFFP-216	
Sample/Parent ID			YTC-OFFP-214-DW-072922		YTC-OFFP-215-DW-072922		YTC-OFFP-216-DW-072922	
Sample Date			07/29/2022		07/29/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.9	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.7	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	10		1.6	J	1.9	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	5.7		1.7	U	1.9	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	62		0.70	J	1.6	J
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	14		1.7	U	1.9	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	0.65	J	1.7	U	1.9	U

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Location			YTC-OFFP-214		YTC-OFFP-215		YTC-OFFP-216	
Sample/Parent ID			YTC-OFFP-214-DW-072922		YTC-OFFP-215-DW-072922		YTC-OFFP-216-DW-072922	
Sample Date			07/29/2022		07/29/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	42		1.7	U	1.9	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	9.5		1.7	U	1.9	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.9	U

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Location			YTC-OFFP-217		YTC-OFFP-218		YTC-OFFP-219	
Sample/Parent ID			YTC-OFFP-217-DW-072822		YTC-OFFP-218-DW-072622		YTC-OFFP-219-DW-080122	
Sample Date			07/28/2022		07/26/2022		08/01/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.6	U	1.7	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.6	U	1.7	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.6	U	1.7	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.6	U	1.7	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.6	U	1.7	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.6	U	1.7	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	4.3		2.7		1.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.6	U	1.7	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.6	U	1.7	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.6	U	0.81	J	1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	0.44	J	8.5		1.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	0.89	J	4.0		0.50	J
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.6	U	1.7	U	1.8	U

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Location			YTC-OFFP-217		YTC-OFFP-218		YTC-OFFP-219	
Sample/Parent ID			YTC-OFFP-217-DW-072822		YTC-OFFP-218-DW-072622		YTC-OFFP-219-DW-080122	
Sample Date			07/28/2022		07/26/2022		08/01/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	0.66	J	2.4		1.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	0.85	J	0.93	J	1.8	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.6	U	1.7	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.6	U	1.7	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.6	U	1.7	U	1.8	U

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Location			YTC-OFFP-220		YTC-OFFP-221		YTC-OFFP-222	
Sample/Parent ID			YTC-OFFP-220-DW-080122		YTC-OFFP-221-DW-072922		YTC-OFFP-222-DW-080122	
Sample Date			08/01/2022		07/29/2022		08/01/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.8	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.8	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.8	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.8	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.8	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.8	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	0.63	J	1.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.8	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.8	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.8	U	1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	U	2.1		1.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	1.8	U	1.8	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.8	U	1.8	U

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Location			YTC-OFFP-220		YTC-OFFP-221		YTC-OFFP-222	
Sample/Parent ID			YTC-OFFP-220-DW-080122		YTC-OFFP-221-DW-072922		YTC-OFFP-222-DW-080122	
Sample Date			08/01/2022		07/29/2022		08/01/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	1.8	U	1.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	1.8	U	1.8	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.8	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.8	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.8	U	1.8	U

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Location			YTC-OFFP-223		YTC-OFFP-223		YTC-OFFP-224	
Sample/Parent ID			YTC-OFFP-223-DW-080122		YTC-OFFP-FD-06-DW-080122 / YTC-OFFP-223-DW-080122		YTC-OFFP-224-DW-072922	
Sample Date			08/01/2022		08/01/2022		07/29/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	0.43	J	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-223		YTC-OFFP-223		YTC-OFFP-224	
Sample/Parent ID			YTC-OFFP-223-DW-080122		YTC-OFFP-FD-06-DW-080122 / YTC-OFFP-223-DW-080122		YTC-OFFP-224-DW-072922	
Sample Date			08/01/2022		08/01/2022		07/29/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-225		YTC-OFFP-226		YTC-OFFP-227	
Sample/Parent ID			YTC-OFFP-225-DW-080122		YTC-OFFP-226-DW-080122		YTC-OFFP-227-DW-072722	
Sample Date			08/01/2022		08/01/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.8	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	0.62	J	1.8	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.8	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.7		1.8	U	2.2	J+
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.8	U	1.7	U

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Location			YTC-OFFP-225		YTC-OFFP-226		YTC-OFFP-227	
Sample/Parent ID			YTC-OFFP-225-DW-080122		YTC-OFFP-226-DW-080122		YTC-OFFP-227-DW-072722	
Sample Date			08/01/2022		08/01/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.8	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	0.77	J	1.8	U	1.7	UB
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.7	U

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Location			YTC-OFFP-228		YTC-OFFP-229		YTC-OFFP-230	
Sample/Parent ID			YTC-OFFP-228-DW-080122		YTC-OFFP-229-DW-072922		YTC-OFFP-230-DW-080122	
Sample Date			08/01/2022		07/29/2022		08/01/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.9	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.9	U	1.8	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.9	U	1.8	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.9	U	1.8	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.9	U	1.8	U	0.55	J
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9	U	1.8	U	1.7	U

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Location			YTC-OFFP-228		YTC-OFFP-229		YTC-OFFP-230	
Sample/Parent ID			YTC-OFFP-228-DW-080122		YTC-OFFP-229-DW-072922		YTC-OFFP-230-DW-080122	
Sample Date			08/01/2022		07/29/2022		08/01/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.9	U	1.8	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.9	U	1.8	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	1.8	U	1.7	U

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Location			YTC-OFFP-231		YTC-OFFP-232		YTC-OFFP-233	
Sample/Parent ID			YTC-OFFP-231-DW-080122		YTC-OFFP-232-DW-080122		YTC-OFFP-233-DW-072922	
Sample Date			08/01/2022		08/01/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	0.43	J	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	0.46	J	0.61	J	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-231		YTC-OFFP-232		YTC-OFFP-233	
Sample/Parent ID			YTC-OFFP-231-DW-080122		YTC-OFFP-232-DW-080122		YTC-OFFP-233-DW-072922	
Sample Date			08/01/2022		08/01/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	0.45	J	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-234		YTC-OFFP-235		YTC-OFFP-236	
Sample/Parent ID			YTC-OFFP-234-DW-072822		YTC-OFFP-235-DW-080122		YTC-OFFP-236-DW-080222	
Sample Date			07/28/2022		08/01/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U	1.9	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.8	U	1.9	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.8	U	1.9	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.8	U	0.95	J
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.8	U	1.9	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.8	U	1.9	U

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Location			YTC-OFFP-234		YTC-OFFP-235		YTC-OFFP-236	
Sample/Parent ID			YTC-OFFP-234-DW-072822		YTC-OFFP-235-DW-080122		YTC-OFFP-236-DW-080222	
Sample Date			07/28/2022		08/01/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.8	U	1.9	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.8	U	1.9	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.9	U

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Location			YTC-OFFP-237		YTC-OFFP-238		YTC-OFFP-239	
Sample/Parent ID			YTC-OFFP-237-DW-072922		YTC-OFFP-238-DW-072722		YTC-OFFP-239-DW-080222	
Sample Date			07/29/2022		07/27/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	U	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	1.7	UB	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-237		YTC-OFFP-238		YTC-OFFP-239	
Sample/Parent ID			YTC-OFFP-237-DW-072922		YTC-OFFP-238-DW-072722		YTC-OFFP-239-DW-080222	
Sample Date			07/29/2022		07/27/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	1.7	UB	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-240		YTC-OFFP-241		YTC-OFFP-242	
Sample/Parent ID			YTC-OFFP-240-DW-080222		YTC-OFFP-241-DW-080222		YTC-OFFP-242-DW-080222	
Sample Date			08/02/2022		08/02/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.8	U	17	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.8	U	12	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.8	U	89	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.8	U	38	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.8	U	0.52	J

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Location			YTC-OFFP-240		YTC-OFFP-241		YTC-OFFP-242	
Sample/Parent ID			YTC-OFFP-240-DW-080222		YTC-OFFP-241-DW-080222		YTC-OFFP-242-DW-080222	
Sample Date			08/02/2022		08/02/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.8	U	92	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.8	U	13	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.7	U

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Location			YTC-OFFP-242		YTC-OFFP-243		YTC-OFFP-244	
Sample/Parent ID			YTC-OFFP-FD-07-DW-080222 / YTC-OFFP-242-DW-080222		YTC-OFFP-243-DW-072922		YTC-OFFP-244-DW-080222	
Sample Date			08/02/2022		07/29/2022		08/02/2022	
Sample Type			FD		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	16		1.8	U	1.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	12		1.8	U	1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	92		1.8	U	1.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	37		1.8	U	1.8	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	0.52	J	1.8	U	1.8	U

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Location			YTC-OFFP-242		YTC-OFFP-243		YTC-OFFP-244	
Sample/Parent ID			YTC-OFFP-FD-07-DW-080222 / YTC-OFFP-242-DW-080222		YTC-OFFP-243-DW-072922		YTC-OFFP-244-DW-080222	
Sample Date			08/02/2022		07/29/2022		08/02/2022	
Sample Type			FD		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	89		1.8	U	1.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	12		1.8	U	1.8	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.8	U

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Location			YTC-OFFP-245		YTC-OFFP-246		YTC-OFFP-247	
Sample/Parent ID			YTC-OFFP-245-DW-080222		YTC-OFFP-246-DW-080222		YTC-OFFP-247-DW-080222	
Sample Date			08/02/2022		08/02/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.7	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-245		YTC-OFFP-246		YTC-OFFP-247	
Sample/Parent ID			YTC-OFFP-245-DW-080222		YTC-OFFP-246-DW-080222		YTC-OFFP-247-DW-080222	
Sample Date			08/02/2022		08/02/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-248		YTC-OFFP-249		YTC-OFFP-250	
Sample/Parent ID			YTC-OFFP-248-DW-080222		YTC-OFFP-249-DW-080222		YTC-OFFP-250-DW-080222	
Sample Date			08/02/2022		08/02/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.6	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.6	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.6	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.6	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.6	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.6	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.6	U	1.8	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.6	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.6	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.6	U	1.8	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.6	U	1.8	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.6	U	1.8	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	0.41	J	1.8	U	1.7	U

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Location			YTC-OFFP-248		YTC-OFFP-249		YTC-OFFP-250	
Sample/Parent ID			YTC-OFFP-248-DW-080222		YTC-OFFP-249-DW-080222		YTC-OFFP-250-DW-080222	
Sample Date			08/02/2022		08/02/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	0.49	J	1.8	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.1	J	1.8	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.6	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.6	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.6	U	1.8	U	1.7	U

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Location			YTC-OFFP-251		YTC-OFFP-252		YTC-OFFP-253	
Sample/Parent ID			YTC-OFFP-251-DW-072622		YTC-OFFP-252-DW-080222		YTC-OFFP-253-DW-080222	
Sample Date			07/26/2022		08/02/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	UJ	1.7	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	UJ	1.7	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	UJ	1.7	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	UJ	1.7	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	6.1		1.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	5.3		1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	UJ	43		1.7	J
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	16		0.76	J
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.8	U

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Location			YTC-OFFP-251		YTC-OFFP-252		YTC-OFFP-253	
Sample/Parent ID			YTC-OFFP-251-DW-072622		YTC-OFFP-252-DW-080222		YTC-OFFP-253-DW-080222	
Sample Date			07/26/2022		08/02/2022		08/02/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	UJ	40		1.4	J
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	5.4		0.46	J
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.8	U

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Location			YTC-OFFP-254		YTC-OFFP-255		YTC-OFFP-256	
Sample/Parent ID			YTC-OFFP-254-DW-072822		YTC-OFFP-255-DW-080322		YTC-OFFP-256-DW-080422	
Sample Date			07/28/2022		08/03/2022		08/04/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	0.88	J	3.2	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.8	U	1.2	J
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.8	U	3.8		18	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	1.8	U	2.8	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.8	U	1.7	U

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Location			YTC-OFFP-254		YTC-OFFP-255		YTC-OFFP-256	
Sample/Parent ID			YTC-OFFP-254-DW-072822		YTC-OFFP-255-DW-080322		YTC-OFFP-256-DW-080422	
Sample Date			07/28/2022		08/03/2022		08/04/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.8	U	0.54	J	2	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	0.49	J	1.2	J
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.8	U	1.7	U

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Location			YTC-OFFP-257		YTC-OFFP-258		YTC-OFFP-259	
Sample/Parent ID			YTC-OFFP-257-DW-072622		YTC-OFFP-258-DW-080322		YTC-OFFP-259-DW-080322	
Sample Date			07/26/2022		08/03/2022		08/03/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	UJ	1.7	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	UJ	1.7	U	1.9	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	UJ	1.7	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	UJ	1.7	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	UJ	1.7	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	UJ	1.7	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.1	J-	1.9		1.9	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	UJ	1.7	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	UJ	1.7	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	UJ	1.2	J	1.9	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	4.1	J-	8.6		0.49	J
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	UJ	4.1		1.9	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	UJ	1.7	U	1.9	U

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Location			YTC-OFFP-257		YTC-OFFP-258		YTC-OFFP-259	
Sample/Parent ID			YTC-OFFP-257-DW-072622		YTC-OFFP-258-DW-080322		YTC-OFFP-259-DW-080322	
Sample Date			07/26/2022		08/03/2022		08/03/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	UJ	1.6	J	1.9	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	UJ	1.7		1.9	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	UJ	1.7	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	UJ	1.7	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	UJ	1.7	U	1.9	U

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Location			YTC-OFFP-260		YTC-OFFP-261		YTC-OFFP-262	
Sample/Parent ID			YTC-OFFP-260-DW-080322		YTC-OFFP-261-DW-080322		YTC-OFFP-262-DW-080322	
Sample Date			08/03/2022		08/03/2022		08/03/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	0.54	J	1.9		4.0	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	0.57	J	1.0	J	2.2	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	2.6		9.6		21	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.1	J	2.6		5.7	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-260		YTC-OFFP-261		YTC-OFFP-262	
Sample/Parent ID			YTC-OFFP-260-DW-080322		YTC-OFFP-261-DW-080322		YTC-OFFP-262-DW-080322	
Sample Date			08/03/2022		08/03/2022		08/03/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	0.88	J	3.4		9.2	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	0.85	J	2.3		5	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-263		YTC-OFFP-263		YTC-OFFP-264	
Sample/Parent ID			YTC-OFFP-263-DW-080322		YTC-OFFP-FD-08-DW-080322 / YTC-OFFP-263-DW-080322		YTC-OFFP-264-DW-072622	
Sample Date			08/03/2022		08/03/2022		07/26/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.8	U	1.7	UJ
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.8	U	1.7	UJ
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.8	U	1.7	UJ
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.8	U	1.7	UJ
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	0.76	J	0.80	J	4.3	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	0.74	J	0.76	J	2.7	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	2.4		2.4		18	J-
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.9		2.0		8.3	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.8	U	1.7	U

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Location			YTC-OFFP-263		YTC-OFFP-263		YTC-OFFP-264	
Sample/Parent ID			YTC-OFFP-263-DW-080322		YTC-OFFP-FD-08-DW-080322 / YTC-OFFP-263-DW-080322		YTC-OFFP-264-DW-072622	
Sample Date			08/03/2022		08/03/2022		07/26/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2.1		2.1		7	J-
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1	J	1.1	J	4.1	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.8	U	1.7	U

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Location			YTC-OFFP-265		YTC-OFFP-266		YTC-OFFP-267	
Sample/Parent ID			YTC-OFFP-265-DW-080322		YTC-OFFP-266-DW-080322		YTC-OFFP-267-DW-072922	
Sample Date			08/03/2022		08/03/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.6		8.4		1.5	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7		3.9		0.83	J
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	14		30		5.5	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	4.8		11		2.1	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.8	U	1.8	U

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Location			YTC-OFFP-265		YTC-OFFP-266		YTC-OFFP-267	
Sample/Parent ID			YTC-OFFP-265-DW-080322		YTC-OFFP-266-DW-080322		YTC-OFFP-267-DW-072922	
Sample Date			08/03/2022		08/03/2022		07/29/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	8.3		6.8		1.3	J
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.7		5.4		1.4	J
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.8	U

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Location			YTC-OFFP-268		YTC-OFFP-269		YTC-OFFP-270	
Sample/Parent ID			YTC-OFFP-268-DW-072922		YTC-OFFP-269-DW-080322		YTC-OFFP-270-DW-080322	
Sample Date			07/29/2022		08/03/2022		08/03/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	3.2		8.5		2.9	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.3		2.1		1.7	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	18		27		13	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	6.7		6.6		4.7	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-268		YTC-OFFP-269		YTC-OFFP-270	
Sample/Parent ID			YTC-OFFP-268-DW-072922		YTC-OFFP-269-DW-080322		YTC-OFFP-270-DW-080322	
Sample Date			07/29/2022		08/03/2022		08/03/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	11		4.1		5.7	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	3.1		2.4		2.9	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-271A		YTC-OFFP-271B		YTC-OFFP-272	
Sample/Parent ID			YTC-OFFP-271A-DW-080322		YTC-OFFP-271B-DW-080322		YTC-OFFP-272-DW-080322	
Sample Date			08/03/2022		08/03/2022		08/03/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	56		50		1.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	37		36		1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	350		350		1.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	110		100		1.8	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	3.1		3.3		1.8	U

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Location			YTC-OFFP-271A		YTC-OFFP-271B		YTC-OFFP-272	
Sample/Parent ID			YTC-OFFP-271A-DW-080322		YTC-OFFP-271B-DW-080322		YTC-OFFP-272-DW-080322	
Sample Date			08/03/2022		08/03/2022		08/03/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	290		280		1.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	61		62		1.8	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.8	U

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Location			YTC-OFFP-273		YTC-OFFP-275		YTC-OFFP-276	
Sample/Parent ID			YTC-OFFP-273-DW-080422		YTC-OFFP-275-DW-072822		YTC-OFFP-276-DW-080422	
Sample Date			08/04/2022		07/28/2022		08/04/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.8	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.8	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.8	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.8	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.8	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.8	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.2		29		4.5	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.8	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.8	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	24		4.0	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	7.5		170		28	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	59		12	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.3	J	1.8	U

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Location			YTC-OFFP-273		YTC-OFFP-275		YTC-OFFP-276	
Sample/Parent ID			YTC-OFFP-273-DW-080422		YTC-OFFP-275-DW-072822		YTC-OFFP-276-DW-080422	
Sample Date			08/04/2022		07/28/2022		08/04/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2.2		150		23	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	34		6	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.8	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.8	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.8	U	1.8	U

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Location			YTC-OFFP-277		YTC-OFFP-278		YTC-OFFP-279	
Sample/Parent ID			YTC-OFFP-277-DW-080422		YTC-OFFP-278-DW-080422		YTC-OFFP-279-DW-080422	
Sample Date			08/04/2022		08/04/2022		08/04/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.6	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.6	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.6	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.6	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.6	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.6	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	4.6		37		20	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.6	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.6	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	0.45	J	26		15	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	14		230		110	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	0.92	J	66		37	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	3.3		1.7	

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Location			YTC-OFFP-277		YTC-OFFP-278		YTC-OFFP-279	
Sample/Parent ID			YTC-OFFP-277-DW-080422		YTC-OFFP-278-DW-080422		YTC-OFFP-279-DW-080422	
Sample Date			08/04/2022		08/04/2022		08/04/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	3		150		67	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.1	J	48		27	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.6	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.6	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.6	U

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Location			YTC-OFFP-280		YTC-OFFP-281		YTC-OFFP-282	
Sample/Parent ID			YTC-OFFP-280-DW-080122		YTC-OFFP-281-DW-072722		YTC-OFFP-282-DW-080422	
Sample Date			08/01/2022		07/27/2022		08/04/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	1.7	UJ	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.9	U	1.7	UJ	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	1.7	UJ	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	1.7	UJ	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	1.7	UJ	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	UJ	1.7	UJ	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	6.0		3.1	J	9.1	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	UJ	1.7	UJ	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	1.7	UJ	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.4	J	1.8	J	1.6	J
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	31		15	J	33	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.9		5.2	J	3.7	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9	UJ	1.7	UJ	1.8	U

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Location			YTC-OFFP-280		YTC-OFFP-281		YTC-OFFP-282	
Sample/Parent ID			YTC-OFFP-280-DW-080122		YTC-OFFP-281-DW-072722		YTC-OFFP-282-DW-080422	
Sample Date			08/01/2022		07/27/2022		08/04/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	14	J-	8.6	J	11	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.9	J-	3.1	J	3.7	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	1.7	UJ	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	1.7	UJ	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	1.7	UJ	1.8	U

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Location			YTC-OFFP-282		YTC-OFFP-284		YTC-OFFP-285	
Sample/Parent ID			YTC-OFFP-FD-09-080422 / YTC-OFFP-282-DW-080422		YTC-OFFP-284-DW-072822		YTC-OFFP-285-DW-080422	
Sample Date			08/04/2022		07/28/2022		08/04/2022	
Sample Type			FD		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.6	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.6	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.6	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.6	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.6	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.6	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	9.7		35		25	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.6	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.6	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7		17		10	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	34		280		180	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	3.7		46		29	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	2.9		1.5	J

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Location			YTC-OFFP-282		YTC-OFFP-284		YTC-OFFP-285	
Sample/Parent ID			YTC-OFFP-FD-09-080422 / YTC-OFFP-282-DW-080422		YTC-OFFP-284-DW-072822		YTC-OFFP-285-DW-080422	
Sample Date			08/04/2022		07/28/2022		08/04/2022	
Sample Type			FD		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	11		220		120	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	3.8		26		18	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.6	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.6	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.6	U	1.7	U

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Location			YTC-OFFP-286		YTC-OFFP-287		YTC-OFFP-288	
Sample/Parent ID			YTC-OFFP-286-DW-080422		YTC-OFFP-287-DW-080422		YTC-OFFP-288-DW-080422	
Sample Date			08/04/2022		08/04/2022		08/04/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	15		23	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	5.6		12	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.1	J	63		160	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	0.52	J	14		29	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.7	

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Location			YTC-OFFP-286		YTC-OFFP-287		YTC-OFFP-288	
Sample/Parent ID			YTC-OFFP-286-DW-080422		YTC-OFFP-287-DW-080422		YTC-OFFP-288-DW-080422	
Sample Date			08/04/2022		08/04/2022		08/04/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2.1		59		98	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.1	J	8.4		20	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.7	U

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Location			YTC-OFFP-289		YTC-OFFP-290		YTC-OFFP-291	
Sample/Parent ID			YTC-OFFP-289-DW-072822		YTC-OFFP-290-DW-080422		YTC-OFFP-291-DW-080422	
Sample Date			07/28/2022		08/04/2022		08/04/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	35		34		12	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	18		27		4.5	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	290	J	230		61	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	51		60		12	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.8		3.1		0.83	J

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Location			YTC-OFFP-289		YTC-OFFP-290		YTC-OFFP-291	
Sample/Parent ID			YTC-OFFP-289-DW-072822		YTC-OFFP-290-DW-080422		YTC-OFFP-291-DW-080422	
Sample Date			07/28/2022		08/04/2022		08/04/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	200	J	160		52	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	29		49		8.1	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.8	U

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Location			YTC-OFFP-292		YTC-OFFP-293		YTC-OFFP-294	
Sample/Parent ID			YTC-OFFP-292-DW-080122		YTC-OFFP-293-DW-080522		YTC-OFFP-294-DW-080522	
Sample Date			08/01/2022		08/05/2022		08/05/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	UJ	1.7	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	21		15		50	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	UJ	1.7	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	11		5.5		26	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	180		88		360	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	26		17		80	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.6	J-	0.47	J	4.9	

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Location			YTC-OFFP-292		YTC-OFFP-293		YTC-OFFP-294	
Sample/Parent ID			YTC-OFFP-292-DW-080122		YTC-OFFP-293-DW-080522		YTC-OFFP-294-DW-080522	
Sample Date			08/01/2022		08/05/2022		08/05/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	130	J-	54		300	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	17	J-	8.3		50	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.8	U

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Location			YTC-OFFP-295		YTC-OFFP-296		YTC-OFFP-297	
Sample/Parent ID			YTC-OFFP-295-DW-080522		YTC-OFFP-296-DW-080522		YTC-OFFP-297-DW-080522	
Sample Date			08/05/2022		08/05/2022		08/05/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	56		14		59	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	42		6.3		36	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	360		52		530	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	120		17		100	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9		0.46	J	6.6	

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Location			YTC-OFFP-295		YTC-OFFP-296		YTC-OFFP-297	
Sample/Parent ID			YTC-OFFP-295-DW-080522		YTC-OFFP-296-DW-080522		YTC-OFFP-297-DW-080522	
Sample Date			08/05/2022		08/05/2022		08/05/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	380		27		400	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	47		7.8		68	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.8	U

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Location			YTC-OFFP-298		YTC-OFFP-300		YTC-OFFP-301	
Sample/Parent ID			YTC-OFFP-298-DW-080522		YTC-OFFP-300-DW-072722		YTC-OFFP-301-DW-080522	
Sample Date			08/05/2022		07/27/2022		08/05/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.6	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.6	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.6	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.6	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.6	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.6	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	8.5		30		45	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.6	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.6	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	3.5		15		33	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	34		140		290	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	9.2		43		95	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.4	J	1.9	

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Location			YTC-OFFP-298		YTC-OFFP-300		YTC-OFFP-301	
Sample/Parent ID			YTC-OFFP-298-DW-080522		YTC-OFFP-300-DW-072722		YTC-OFFP-301-DW-080522	
Sample Date			08/05/2022		07/27/2022		08/05/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	10		54		310	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	6		24		42	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.6	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.6	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.6	U	1.7	U

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Location			YTC-OFFP-302		YTC-OFFP-302		YTC-OFFP-303	
Sample/Parent ID			YTC-OFFP-302-DW-080122		YTC-OFFP-FD-10-DW-080122 / YTC-OFFP-302-DW-080122		YTC-OFFP-303-DW-080122	
Sample Date			08/01/2022		08/01/2022		08/01/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	15		16		2.3	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	12		12		1.1	J
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	80		82		7.7	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	35		35		2.8	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	0.54	J	0.54	J	1.7	U

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Location			YTC-OFFP-302		YTC-OFFP-302		YTC-OFFP-303	
Sample/Parent ID			YTC-OFFP-302-DW-080122		YTC-OFFP-FD-10-DW-080122 / YTC-OFFP-302-DW-080122		YTC-OFFP-303-DW-080122	
Sample Date			08/01/2022		08/01/2022		08/01/2022	
Sample Type			N		FD		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	71		72		1.7	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	14		14		1.4	J
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.7	U

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Location			YTC-OFFP-304		YTC-OFFP-305		YTC-OFFP-306	
Sample/Parent ID			YTC-OFFP-304-DW-080322		YTC-OFFP-305-DW-080522		YTC-OFFP-306-DW-080122	
Sample Date			08/03/2022		08/05/2022		08/01/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	17		44		0.58	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	8.5		37		0.44	J
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	97		340		1.9	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	29		88		0.57	J
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	4.3		1.7	U

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Location			YTC-OFFP-304		YTC-OFFP-305		YTC-OFFP-306	
Sample/Parent ID			YTC-OFFP-304-DW-080322		YTC-OFFP-305-DW-080522		YTC-OFFP-306-DW-080122	
Sample Date			08/03/2022		08/05/2022		08/01/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	67		220		0.94	J
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	8.1		64		0.52	J
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.7	U

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Location			YTC-OFFP-307		YTC-OFFP-308		YTC-OFFP-309	
Sample/Parent ID			YTC-OFFP-307-DW-080122		YTC-OFFP-308-DW-080122		YTC-OFFP-309-DW-080122	
Sample Date			08/01/2022		08/01/2022		08/01/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.8	U	0.55	J	3.0	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.8	U	1.8	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	0.89	J	1.3	J	1.0	J
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.8	U	1.8	U	1.7	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.8	U	1.8	U	1.7	U

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Location			YTC-OFFP-307		YTC-OFFP-308		YTC-OFFP-309	
Sample/Parent ID			YTC-OFFP-307-DW-080122		YTC-OFFP-308-DW-080122		YTC-OFFP-309-DW-080122	
Sample Date			08/01/2022		08/01/2022		08/01/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	0.9	J	2.1		1.1	J
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.8	U	0.62	J	1.1	J
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.8	U	1.7	U

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Location			YTC-OFFP-310		YTC-OFFP-311		YTC-OFFP-313	
Sample/Parent ID			YTC-OFFP-310-DW-080422		YTC-OFFP-311-DW-080422		YTC-OFFP-313-DW-072722	
Sample Date			08/04/2022		08/04/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.7	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.7	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.7	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.7	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.7	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.7	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	14		5.1		1.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.7	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.7	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	6.1		3.2		1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	51		37		1.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	15		6.5		1.8	UB
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	0.88	J	1.7	U	1.8	U

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Location			YTC-OFFP-310		YTC-OFFP-311		YTC-OFFP-313	
Sample/Parent ID			YTC-OFFP-310-DW-080422		YTC-OFFP-311-DW-080422		YTC-OFFP-313-DW-072722	
Sample Date			08/04/2022		08/04/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	59		31		1.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	9.1		4.8		1.8	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.7	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.7	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.7	U	1.8	U

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Location			YTC-OFFP-314		YTC-OFFP-315		YTC-OFFP-316	
Sample/Parent ID			YTC-OFFP-314-DW-072522		YTC-OFFP-315-DW-080122		YTC-OFFP-316-DW-072522	
Sample Date			07/25/2022		08/01/2022		07/25/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	0.55	J	6.3	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.8	U	3.0	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.8		26	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.8	U	10	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.8	U	1.7	U

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Location			YTC-OFFP-314		YTC-OFFP-315		YTC-OFFP-316	
Sample/Parent ID			YTC-OFFP-314-DW-072522		YTC-OFFP-315-DW-080122		YTC-OFFP-316-DW-072522	
Sample Date			07/25/2022		08/01/2022		07/25/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.8	U	20	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.8	U	4.9	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.7	U

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Location			YTC-OFFP-317		YTC-OFFP-318		YTC-OFFP-319	
Sample/Parent ID			YTC-OFFP-317-DW-073022		YTC-OFFP-318-DW-072722		YTC-OFFP-319-DW-072722	
Sample Date			07/30/2022		07/27/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.9	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.9	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.9	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.9	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.6	J	1.7	U	0.94	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.9	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.9	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	0.68	J	1.7	U	1.9	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.2	J	0.53	J	1.8	J
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.1	J	1.7	UB	2.1	J+
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.9	U

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Location			YTC-OFFP-317		YTC-OFFP-318		YTC-OFFP-319	
Sample/Parent ID			YTC-OFFP-317-DW-073022		YTC-OFFP-318-DW-072722		YTC-OFFP-319-DW-072722	
Sample Date			07/30/2022		07/27/2022		07/27/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	0.64	J	1.7	U	1.9	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.2	J	1.7	UB	1.9	UB
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.9	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.9	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.9	U

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Location			YTC-OFFP-320		YTC-OFFP-321		YTC-OFFP-322	
Sample/Parent ID			YTC-OFFP-320-DW-072922		YTC-OFFP-321-DW-080222		YTC-OFFP-322-DW-080322	
Sample Date			07/29/2022		08/02/2022		08/03/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.8	U	1.8	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.8	U	1.8	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.8	U	1.8	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.8	U	1.8	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.8	U	1.8	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.8	U	1.8	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	32		11		1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.8	U	1.8	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.8	U	1.8	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	9.9		2.7		1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	96		62		1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	52		14		1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	0.93	J	1.8	U	1.7	U

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Location			YTC-OFFP-320		YTC-OFFP-321		YTC-OFFP-322	
Sample/Parent ID			YTC-OFFP-320-DW-072922		YTC-OFFP-321-DW-080222		YTC-OFFP-322-DW-080322	
Sample Date			07/29/2022		08/02/2022		08/03/2022	
Sample Type			N		N		N	
Matrix			Drinking Water		Drinking Water		Drinking Water	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	68		44		1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	13		3.8		1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.8	U	1.8	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.8	U	1.8	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.8	U	1.8	U	1.7	U

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Location			N/A		N/A		N/A	
Sample/Parent ID			YTC-FRB-1-090821		YTC-FRB-02-090921		YTC-FRB-01-012022	
Sample Date			09/08/2021		09/09/2021		01/20/2022	
Sample Type			QC		QC		QC	
Matrix			FRB		FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.1	U	2.0	U	2.0	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.4	U	8.1	U	8.1	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.1	U	2.0	U	2.0	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.1	U	2.0	U	2.0	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.1	U	2.0	U	2.0	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.1	U	2.0	U	2.0	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.1	U	2.0	U	2.0	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.1	U	2.0	U	2.0	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.1	U	2.0	U	2.0	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.1	U	2.0	U	2.0	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	2.1	U	2.0	U	2.0	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.1	U	2.0	U	2.0	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.1	U	2.0	U	2.0	U

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Location			N/A		N/A		N/A	
Sample/Parent ID			YTC-FRB-1-090821		YTC-FRB-02-090921		YTC-FRB-01-012022	
Sample Date			09/08/2021		09/09/2021		01/20/2022	
Sample Type			QC		QC		QC	
Matrix			FRB		FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2.1	U	2.0	U	2.0	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.1	U	2.0	U	2.0	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.1	U	2.0	U	2.0	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.1	U	2.0	U	2.0	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.1	U	2.0	U	2.0	U

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Location			N/A		N/A		N/A	
Sample/Parent ID			YTC-FRB-02-012122		YTC-FRB-03-012222		YTC-FRB-04-012522	
Sample Date			01/21/2022		01/22/2022		01/25/2022	
Sample Type			QC		QC		QC	
Matrix			FRB		FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.2	U	2.0	U	2.3	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.8	U	8.2	U	9.3	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.2	U	2.0	U	2.3	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.2	U	2.0	U	2.3	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.2	U	2.0	U	2.3	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.2	U	2.0	U	2.3	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.2	U	2.0	U	2.3	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.2	U	2.0	U	2.3	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.2	U	2.0	U	2.3	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.2	U	2.0	U	2.3	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	2.2	U	2.0	U	2.3	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.2	U	2.0	U	2.3	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.2	U	2.0	U	2.3	U

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			N/A		N/A		N/A	
Sample/Parent ID			YTC-FRB-02-012122		YTC-FRB-03-012222		YTC-FRB-04-012522	
Sample Date			01/21/2022		01/22/2022		01/25/2022	
Sample Type			QC		QC		QC	
Matrix			FRB		FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2.2	U	2.0	U	2.3	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.2	U	2.0	U	2.3	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.2	U	2.0	U	2.3	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.2	U	2.0	U	2.3	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.2	U	2.0	U	2.3	U

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			N/A		N/A		N/A	
Sample/Parent ID			YTC-FRB-05-012622		YTC-OFFP-FRB-01-DW-072522		YTC-OFFP-FRB2-DW-072622	
Sample Date			01/26/2022		07/25/2022		07/26/2022	
Sample Type			QC		QC		QC	
Matrix			FRB		FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.2	U	1.7	U	1.7	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.7	U	1.7	U	1.7	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.2	U	1.7	U	1.7	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.2	U	1.7	U	1.7	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.2	U	1.7	U	1.7	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.2	U	1.7	U	1.7	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.2	U	1.7	U	1.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.2	U	1.7	U	1.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.2	U	1.7	U	1.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.2	U	1.7	U	1.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	2.2	U	1.7	U	1.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.2	U	1.7	U	1.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.2	U	1.7	U	1.7	U

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			N/A		N/A		N/A	
Sample/Parent ID			YTC-FRB-05-012622		YTC-OFFP-FRB-01-DW-072522		YTC-OFFP-FRB2-DW-072622	
Sample Date			01/26/2022		07/25/2022		07/26/2022	
Sample Type			QC		QC		QC	
Matrix			FRB		FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2.2	U	1.7	U	1.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.2	U	1.7	U	1.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.2	U	1.7	U	1.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.2	U	1.7	U	1.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.2	U	1.7	U	1.7	U

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			N/A		N/A		N/A	
Sample/Parent ID			YTC-OFFP-FRB3-DW-072722		YTC-OFFP-FRB-04-072822		YTC-OFFP-FRB5-072922	
Sample Date			07/27/2022		07/28/2022		07/29/2022	
Sample Type			QC		QC		QC	
Matrix			FRB		FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.7	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.7	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.7	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.7	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.7	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.7	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.7	U	1.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.7	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.7	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.7	U	1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.7	U	1.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.2	J	1.7	U	1.8	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.7	U	1.8	U

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			N/A		N/A		N/A	
Sample/Parent ID			YTC-OFFP-FRB3-DW-072722		YTC-OFFP-FRB-04-072822		YTC-OFFP-FRB5-072922	
Sample Date			07/27/2022		07/28/2022		07/29/2022	
Sample Type			QC		QC		QC	
Matrix			FRB		FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.7	U	1.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	0.55	J	1.7	U	1.8	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.7	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.7	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.7	U	1.8	U

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			N/A		N/A		N/A	
Sample/Parent ID			YTC-OFFP-FRB-07-DW-080122		YTC-OFFP-FRB-08-DW-080222		YTC-OFFP-FRB-09-DW-080322	
Sample Date			08/01/2022		08/02/2022		08/03/2022	
Sample Type			QC		QC		QC	
Matrix			FRB		FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.8	U	1.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.8	U	1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.8	U	1.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.8	U	1.8	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.8	U	1.8	U

Attachment 1 - Validated Analytical Data Tables
 Preliminary Assessment/Site Inspection Addendum
 Joint Base Lewis-McChord - Yakima Training Center, WA



Location			N/A		N/A		N/A	
Sample/Parent ID			YTC-OFFP-FRB-07-DW-080122		YTC-OFFP-FRB-08-DW-080222		YTC-OFFP-FRB-09-DW-080322	
Sample Date			08/01/2022		08/02/2022		08/03/2022	
Sample Type			QC		QC		QC	
Matrix			FRB		FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual
PFAS								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.8	U	1.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.8	U	1.8	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U	1.8	U

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Location			N/A		N/A	
Sample/Parent ID			YTC-OFFP-FRB-10-DW-080422		YTC-OFFP-FRB-11-DW-080522	
Sample Date			08/04/2022		08/05/2022	
Sample Type			QC		QC	
Matrix			FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual
PFAS						
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.7	U	1.8	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	1.7	U	1.8	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.7	U	1.8	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.7	U	1.8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.7	U	1.8	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.7	U	1.8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.7	U	1.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.7	U	1.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.7	U	1.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.7	U	1.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.7	U	1.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.7	U	1.8	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.7	U	1.8	U

Attachment 1 - Validated Analytical Data Tables
 Preliminary Assessment/Site Inspection Addendum
 Joint Base Lewis-McChord - Yakima Training Center, WA



Location			N/A		N/A	
Sample/Parent ID			YTC-OFFP-FRB-10-DW-080422		YTC-OFFP-FRB-11-DW-080522	
Sample Date			08/04/2022		08/05/2022	
Sample Type			QC		QC	
Matrix			FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual
PFAS						
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.7	U	1.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.7	U	1.8	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.7	U	1.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.7	U	1.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.7	U	1.8	U

Attachment 1 - Validated Analytical Data Tables
Preliminary Assessment/Site Inspection Addendum
Joint Base Lewis-McChord - Yakima Training Center, WA



Notes:

1. **Bolded** values indicate the result was detected greater than the limit of detection.
2. Grey shaded values indicate the result was detected greater than the 2016 United States Environmental Protection Agency lifetime health advisory of 70 ng/L for PFOS, PFOA, or the sum of the two.

Acronyms/Abbreviations:

-- = not applicable

% = percent

CAS = Chemical Abstracts Service number

FD = field duplicate sample

FRB = field reagent blank

ID = identification

N = primary sample

N/A = not applicable

ng/L = nanograms per liter (parts per trillion)

OFFP = off-post

PFAS = per- and polyfluoroalkyl substances

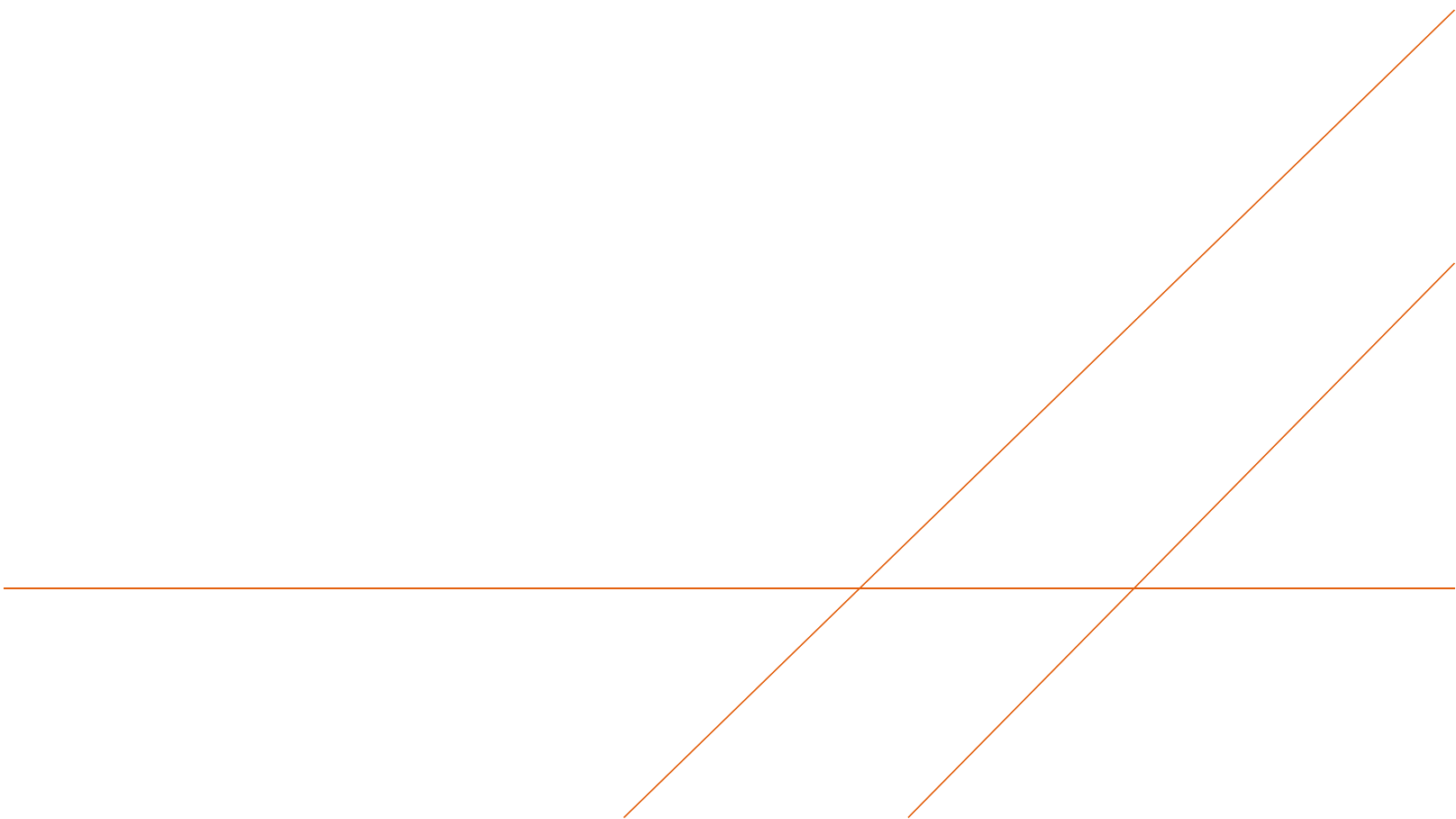
QC = quality control

Qual = qualifier

YTC = Yakima Training Center (Joint Base Lewis-McChord / Yakima Training Center, Yakima, Washington)

Qualifier	Description
D	The analyte was analyzed at dilution.
E	The reported result is above the limit of the calibration range.
J	The analyte was positively identified; however the associated numerical value is an estimated concentration only.
J+	The result is an estimated quantity; the result may be biased high.
J-	The result is an estimated quantity; the result may be biased low.
M	Manually intergrated compound.
U	The analyte was analyzed for but the result was not detected above the limit of quantitation.
UB	The analyte is considered nondetect at the listed value due to associated blank contamination.
UJ	The analyte was analyzed for but was not detected. The reported limit of quantitation is approximate and may be inaccurate or imprecise.

ATTACHMENT 2
Data Usability Summary Report



Off-Post Sampling USAEC Baltimore PFAS
Joint Base Lewis-McChord Yakima Training Center

DATA USABILITY SUMMARY REPORT

2021-2022 Sampling Event

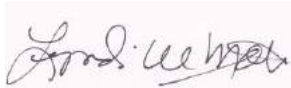
February 21, 2022

DATA USABILITY SUMMARY REPORT

2021-2022 Sampling Event

Prepared for:

U.S. Army Environmental Command
U.S. Army Corps of Engineers Baltimore District
JBLM Yakima Training Center, Washington



Lyndi Mott
Program Chemist

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Our Ref.:

Contract W912DR-18-D-0009
Arcadis Project: 30059933

Date: February 21, 2022

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TABLES

Table 1. Data Usability Summary Table

ATTACHMENTS

Data Validation Reports

ACRONYMS AND ABBREVIATIONS

%D	percent difference
%R	percent recovery
Arcadis	Arcadis U.S., Inc.
DoD	Department of Defense
DUSR	data usability summary report
DVR	data validation report
EIS	extracted internal standards
ELAP	Environmental Laboratory Accreditation Program
ICV/CCV	initial calibration verification/continuing calibration verification
JBLM	Joint Base Lewis-McChord
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
LOQ	limit of quantitation
MS/MSD	matrix spike/matrix spike duplicate
NELAP	National Environmental Laboratory Accreditation Program
PACE	Pace Analytical South Carolina
PFAS	per/polyfluoroalkyl substances
PQAPP	Programmatic Uniform Federal Policy-Quality Assurance Project Plan
QAPP	Quality Assurance Project Plan
QC	quality control
QSM	Quality System Manual
RPD	relative percent difference
SDG	sample delivery group
USDOD	United States Department of Defense
USEPA	United States Environmental Protection Agency
YTC	Yakima Training Center

EXECUTIVE SUMMARY

This Data Usability Summary Report (DUSR) for Joint Base Lewis-McChord (JBLM) Yakima Training Center located in Washington for the 2021 through January 2022 sampling event describes the findings of the data review and validation and is provided to document the quality of the analytical data used for project decisions. A Data Usability Summary Table at the end of this DUSR lists the data that was qualified and the reason for qualification. Only the sample locations associated with this site and sampling event in the associated laboratory data packages and data validation reports are addressed in this report. The text below adds details where further discussion is warranted. The project-specific sampling and analysis, overall quality control (QC), and quality assurance protocols are presented in the Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan (PQAPP Arcadis 2019), and the Uniform Federal Policy-Quality Assurance Project Plan Addendum for Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances Joint Base Lewis-McChord Yakima Training Center (YTC), Washington (QAPP Addendum Arcadis 2021).

Samples were shipped to Pace Analytical (Pace) located in West Columbia, South Carolina for analysis. Pace is a United States Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP) and National Environmental Laboratory Accreditation Program (NELAP) accredited laboratories. The analytical sample delivery groups (SDGs) and associated Arcadis validation reports are listed in the table below. Summaries of the sample IDs and their associated laboratory IDs, SDGs, sampling dates, and analyses performed are provided in the laboratory reports and data validation reports (DVRs). Note the result pages in the DVRs may have a red line through specific or all compounds to indicate those results are not reportable. Results will be reported from either the initial, diluted, or re-extracted analysis.

In accordance with the project QAPP data review requirements, Stage 3, and 10 percent Stage 4 validation of the analytical data was performed by Arcadis project chemists that are independent of the project team. The validation was performed in accordance with the guidelines and control criteria specified in the following documents:

USDOD. Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 May 2019.

USDOD. DoD General Data Validation Guidelines, November 2019.

USEPA. Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018.

Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan (PQAPP Arcadis 2019).

Uniform Federal Policy-Quality Assurance Project Plan Addendum for Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances Joint Base Lewis-McChord Yakima Training Center (YTC), Washington (QAPP Addendum Arcadis 2021).

The laboratory data packages and validation reports that were reviewed for this DUSR are listed below.

DATA USABILITY SUMMARY REPORT

Sample Delivery Groups (SDG)	Validation Report	Matrix	Parameters	Validation Level
WI10062	42961R	Potable water	PFAS	Stage 3: 10 field samples 1 field duplicate Stage 4: 1 field sample
WI10065	42962R	Potable water	PFAS	Stage 3: 10 field samples 1 field duplicate Stage 4: 1 field sample
XA25009	44396R	Potable water	PFAS	Stage 3: 15 field samples Stage 4: 2 field samples
XA25017	44477R	Potable water	PFAS	Stage 3: 21 field samples; 2 field duplicates Stage 4: 3 field samples
XA26028	44525R	Potable water	PFAS	Stage 3: 17 field samples; 1 field duplicate Stage 4: 2 field samples
XA27031	44527R	Potable water	PFAS	Stage 3: 9 field samples; 2 field duplicates Stage 4: 1 field sample
XA28030	44526R	Potable water	PFAS	Stage 3: 14 field samples Stage 4: 2 field samples

PRECISION

Precision is expressed as a relative percent difference (RPD) between the results of replicate sample analyses: sample duplicates, laboratory control sample duplicates (LCSDs), and matrix spike duplicates (MSDs). The RPD limit for LCSDs and MSDs is 30 percent. Field duplicates were collected at a frequency of 5 percent. Unless documented below or in the Data Usability Summary table, the RPD between the parent samples and associated field duplicates were within method specified limits of 30 percent for water matrix.

Potable water sample YTC-PAIC-PRE-DW-090921 was identified as the parent sample to field duplicate YTC-FD-2-DW-090921. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

Potable water sample YTC-OFFP-19-DW-090821 was identified as the parent sample to field duplicate YTC-FD-1-DW-090821. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

Potable water sample YTC-OFFP-39-DW-011922 was identified as the parent sample to field duplicate YTC-FD-01-DW-011922. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

DATA USABILITY SUMMARY REPORT

Potable water sample YTC-OFFP-54-DW-012022 was identified as the parent sample to field duplicate YTC-FD-02-DW-012022. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

Potable water sample YTC-OFFP-77-DW-012422 was identified as the parent sample to field duplicate YTC-FD-03-DW-012422. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

Potable water sample YTC-OFFP-102-DW-012522 was identified as the parent sample to field duplicate YTC-OFFP-FD-04-DW-012522. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

Potable water sample YTC-OFFP-120-DW-012622 was identified as the parent sample to field duplicate YTC-OFFP-FD-05-DW-012622. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

ACCURACY

Accuracy is demonstrated by recovery of target analytes from fortified blank and sample matrices, LCS/LCSDs and MS/MSDs, respectively. The recovery of target analytes from fortified samples is compared to acceptance criteria. The criteria for LCS/LCSDs and MS/MSDs are 70 to 130 percent as listed in USEPA method 537.1. The criteria for surrogate recoveries are 70 to 130 percent. In addition, Stage 4 validation of initial and continuing calibration results provide information on analytical accuracy. Unless documented below or in the Data Usability Summary table, the recoveries of LCS, MS/MSD, surrogates, and calibration criteria, were within acceptable limits.

REPRESENTATIVENESS

Representativeness is the degree to which sample data accurately and precisely represent site conditions and is dependent on sampling and analytical variability and the variability (or homogeneity) of the site itself. The use of the prescribed field and laboratory analytical methods with associated holding times and preservation requirements are intended to provide representative data.

All samples were collected and submitted for analysis in accordance with the procedures and sampling plan specified in the site QAPP and field SOPs. Analysis of samples was in accordance with the USACE PFAS PA/SI PQAPP, USACE PFAS QAPP Addendum, USEPA method 537.1, and laboratory SOPs. All hold times were met except for the re-extracted analysis of sample location YTC-OFFP-27-DW-011822 as noted in the Data Usability Summary Table. The initial analysis exhibited surrogate recoveries outside control limits. The re-extracted analysis was performed one day past the hold time of 14 days. Therefore, the impact on the reported data should be minimal.

SENSITIVITY

Sensitivity describes the relationship between the laboratory quantitation limits and the project action limits. Reported laboratory quantitation limits are compared to the project detection limits to ensure that the analytical methods are capable of quantifying target analytes to a level that would satisfy DQOs.

DATA USABILITY SUMMARY REPORT

Many samples required a secondary dilution to report all PFAS compounds within the calibration range. All reported results from the diluted analysis were for detections of PFAS. The sample results from the initial undiluted analysis met sensitivity requirements.

COMPLETENESS

The completeness for this data set met the criteria of 90 percent. No results were rejected due to quality control deficiencies.

CONCLUSIONS

The overall assessment of the field samples, QA/QC data review by manual validation of the 2021 through January 2022 data set from JBLM YTC met project requirements and completeness goals. Based upon the Stage 3 and Stage 4 data validation, all results are considered valid and usable. The results that are qualified as estimated are usable with caution. The detections are valid, but the reported concentration may be biased. If the data is evaluated against screening criteria, qualified results at or near the screening criteria should be evaluated considering the possible bias in the reported results.

DATA USABILITY SUMMARY TABLE

DATA USABILITY SUMMARY TABLE
Joint Base Lewis-McChord Yakima Training Center; Off-Post Sampling Events

Sample Locations	Compound	Qualifier	Reason
YTC-OFFP-20-DW-090921	GenX	UJ	MS/MSD %R; low bias
	Perfluorohexanesulfonic acid Perfluorohexanoic acid	J-	MS %R; low bias
YTC-OFFP-05-DW-090921	Perfluorobutanesulfonic acid Perfluorohexanesulfonic acid Perfluorohexanoic acid Perfluorooctanoic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-18-DW-090921 YTC-OFFP-06-DW-090821 YTC-OFFP-13-DW-090721	Perfluorohexanesulfonic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-07-DW-090821	Perfluorohexanesulfonic acid Perfluorooctanesulfonic acid	DJ+	Result reported from secondary dilution and Surrogate %R; high bias
YTC-OFFP-16-DW-090921	All target PFAS compounds	UJ non-detects J- detects	Surrogate %R; low bias
YTC-OFFP-08-DW-090821	Perfluorobutanesulfonic acid Perfluorohexanesulfonic acid Perfluorohexanoic acid Perfluorooctanoic acid Perfluorooctanesulfonic acid	DJ+	Result reported from secondary dilution and Surrogate %R; high bias
YTC-OFFP-19-DW-090821	All target PFAS compounds	UJ non-detects J- detects	Surrogate %R; low bias
YTC-OFFP-02-DW-090821	Perfluorooctanesulfonic acid	J+	MS %R; high bias
	Perfluorohexanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-01-DW-090821	Perfluorobutanesulfonic acid Perfluorohexanesulfonic acid Perfluorohexanoic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-15-DW-090721	Perfluorohexanesulfonic acid Perfluorohexanoic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-14-DW-090721	Perfluorohexanesulfonic acid	D	Result reported from secondary dilution

Sample Locations	Compound	Qualifier	Reason
YTC-OFFP-60-DW-012122	Perfluorononanoic acid	J-	MS %R; low bias
	Perfluorotridecanoic acid	UJ	
	Perfluorohexanesulfonic acid Perfluorohexanoic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-65-DW-012122 YTC-OFFP-66-DW-012122 YTC-OFFP-62-DW-012122	Perfluorobutanesulfonic acid Perfluorohexanesulfonic acid Perfluorohexanoic acid Perfluorooctanoic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-61-DW-012122 YTC-OFFP-74-DW-012122 YTC-OFFP-67-DW-012122 YTC-OFFP-38-DW-011922 YTC-OFFP-31-DW-011922 YTC-OFFP-99-DW-012522 YTC-FD-03-DW-012422 YTC-OFFP-92-DW-012522 YTC-OFFP-100-DW-012522 YTC-OFFP-72-DW-012422 YTC-OFFP-88-DW-012422 YTC-OFFP-51-DW-012722	Perfluorohexanesulfonic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-56-DW-012122 YTC-OFFP-70-DW-012122 YTC-OFFP-63-DW-012122 YTC-OFFP-59-DW-012122 YTC-OFFP-85-DW-012422	Perfluorohexanesulfonic acid Perfluorohexanoic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-73-DW-012122 YTC-OFFP-55-DW-012122 YTC-OFFP-42-DW-011922 YTC-OFFP-81-DW-012422 YTC-OFFP-83-DW-012422	Perfluorobutanesulfonic acid Perfluorohexanesulfonic acid Perfluorohexanoic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-76-DW-012422 YTC-OFFP-101-DW-012522 YTC-OFFP-84-DW-012422	Perfluorohexanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-27-DW-011822 RE	All target PFAS compounds	UJ non-detects J detects	Hold time exceedance for re-extracted results. Initial analysis had low surrogate low recoveries
YTC-OFFP-39-DW-011922	All target PFAS compounds	UJ non-detects J- detects	Surrogate %R; low bias
	GenX	UJ	Surrogate %R; low bias MS %R; low bias
YTC-OFFP-86-DW-012422 DL	Perfluorohexanesulfonic acid	DJ-	Result reported from secondary dilution Surrogate %R; low bias

Sample Locations	Compound	Qualifier	Reason
YTC-OFFP-32-DW-011922	All target PFAS compounds except: Perfluorobutanesulfonic acid Perfluorohexanesulfonic acid Perfluorohexanoic acid Perfluorooctanesulfonic acid	UJ non-detects J- detects	Surrogate %R; low bias
	Perfluorobutanesulfonic acid Perfluorohexanesulfonic acid Perfluorohexanoic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-77-DW-012422	Perfluorooctanoic acid	J+	MS %R; high bias
	Perfluorohexanesulfonic acid Perfluorohexanoic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-104-DW-012522 YTC-OFFP-96-DW-012522	Perfluorooctanesulfonic acid	J	Ion ratio %R
YTC-OFFP-102-DW-012522	GenX Perfluorohexanoic acid	UJ	MS/MSD %R; low bias
	Perfluorobutanesulfonic acid	J-	
YTC-OFFP-95-DW-012522 DL	Perfluorohexanesulfonic acid	DJ+	Result reported from secondary dilution and Surrogate %R; high bias
YTC-OFFP-91-DW-012522 DL	Perfluorohexanesulfonic acid Perfluorooctanesulfonic acid	DJ+	Result reported from secondary dilution and Surrogate %R; high bias

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated due to non-conformances discovered during data validation.
- J+ (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated due to non-conformances discovered during data validation. Result may be biased high.
- J- (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated due to non-conformances discovered during data validation. Result may be biased low.
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however, the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- D (Diluted): Diluted sample result reported from a secondary dilution due to calibration range exceedance.
- R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in QC criteria. The analyte may or may not be present in the sample.

DATA VALIDATION REPORTS

Yakima Training Center PFAS PA/SI

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #WI10062

Pace South Carolina

formerly Shealy Environmental Services

West Columbia, South Carolina

Report #42961R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) #WI10062 for samples collected in association with the Yakima Training Center Site. The review was conducted as a Stage 3/4 evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	TOC	MISC
YTC-OFFP-20-DW-090921	WI10062-001	Potable Water	9/9/2021		X		
YTC-OFFP-11-DW-090821	WI10062-002	Potable Water	9/8/2021		X		
YTC-OFFP-17-DW-090821	WI10062-003	Potable Water	9/8/2021		X		
YTC-PAIC-PRE-DW-090921	WI10062-004	Potable Water	9/9/2021		X		
YTC-OFFP-03-DW-090921	WI10062-005	Potable Water	9/9/2021		X		
YTC-OFFP-05-DW-090921	WI10062-006	Potable Water	9/9/2021		X		
YTC-OFFP-21-DW-090921	WI10062-007	Potable Water	9/9/2021		X		
YTC-OFFP-12-DW-090921	WI10062-008	Potable Water	9/9/2021		X		
YTC-FRB-1-090821	WI10062-009	Potable Water	9/8/2021		X		
YTC-OFFP-18-DW-090921	WI10062-010	Potable Water	9/9/2021		X		
YTC-FD-2-DW-090921	WI10062-011	Potable Water	9/9/2021	YTC-PAIC-PRE-DW-090921	X		
YTC-OFFD-07-DW-090821	WI10062-012	Potable Water	9/8/2021		X		
YTC-OFFD-16-DW-090921	WI10062-013	Potable Water	9/9/2021		X		

Note:

1. Stage 4 evaluation was performed on sample location YTC-OFFP-05-DW-090921.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location YTC-OFFP-20-DW-090921.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 1.1 for drinking water. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00216-06 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.1.1 and 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Per DoD General Data Validation Guidelines November 2019 Revision 1 Section 4.8 states; "The following provides a brief explanation of the DoD data validation qualifiers assigned to results during the data review process by a data validator. The reviewer should use these qualifiers, as applicable, unless other data qualifiers are specified in a project related document, such as a QAPP. If other qualifiers are used, a complete explanation of those qualifiers should accompany the data validation report." Below are the qualifier codes that may be applied in this validation report:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and

DATA REVIEW REPORT

provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 1.1	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were extracted and analyzed within the specified holding time criteria with the following noted:

Sample YTC-OFFD-16-DW-090921 was re-extracted and reanalyzed outside of the method-specified holding time (re-extraction performed 23 days from collection). The sample was re-extracted since the surrogate compound 13C3-HFPO-DA recovered below the acceptance limit in the original analysis of the sample (see Section 5.1 below). The results from the reanalysis confirmed the original analysis. The results from the original analysis of sample YTC-OFFD-16-DW-090921 were marked as reportable with qualification for the surrogate recovery as discussed in Section 5.1.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

All compounds associated with initial calibration were within the control limits.

DATA REVIEW REPORT

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit of 30%.

All compounds associated with CCV %D were within control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.3 Table B-15.

The ion transitions were as specified in DoD QSM 5.3.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 1.1 must be within 70% to 130% of the true value.

Sample locations associated with surrogate exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Surrogate	%R
YTC-OFFD-07-DW-090821 (5x dilution)	13C2_PFHxA	AC
	13C3-HFPO-DA	
	13C6_PFDA	
	d5-EtFOSAA	> 130%
YTC-OFFD-16-DW-090921	13C2_PFHxA	AC
	13C3-HFPO-DA	< 70% but > 10%
	13C6_PFDA	AC
	d5-EtFOSAA	

Note:

AC Acceptable

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 130%	Non-detect	No Action
	Detect	J+
< 70% but > 10%	Non-detect	UJ
	Detect	J-

DATA REVIEW REPORT

Control Limit	Sample Result	Qualification
< 10%	Non-detect	R
	Detect	J-

5.2 Injection Internal Standards

Injection internal standards must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

Sample locations associated with internal standards exhibiting responses outside of the control limits are presented in the following table.

Sample Locations	Internal Standard	Response
YTC-OFFP-05-DW-090921 (undiluted)	13C4-PFOS	65%

The compounds associated with IS 13C4-PFOS are PFOS, PFBS, and PFHxS. These compounds were reported from a diluted analysis for this sample. Therefore, qualification for the undiluted analysis is not required.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the EPA method 537 version 1.1 specified acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
YTC-OFFP-20-DW-090921	Hexafluoropropylene oxide dimer acid (Gen X)	< 70% but > 10%	< 70% but > 10%
	Perfluorohexane sulfonic acid	< 70% but > 10%	AC
	Perfluorohexanoic acid	< 70% but > 10%	AC

Note:

AC Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

DATA REVIEW REPORT

Control Limit	Sample Result	Qualification
> 130%	Non-detect	No Action
	Detect	J+
< 70% but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	R
	Detect	J-

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within EPA method 537 version 1.1 acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 35% for water matrices and 50% for soils is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied for water matrices and three times the LOQ for soil matrices.

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
YTC-PAIC-PRE-DW-090921 / YTC-FD-2-DW-090921	All target PFAS compounds	U	U	AC

Notes:

AC Acceptable

There were no compounds detected in the parent sample and field duplicate sample.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

DATA REVIEW REPORT

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-05-DW-090921	Perfluorobutane sulfonic acid	--	150	150 D
	Perfluorohexane sulfonic acid	--	1,000	1,000 D
	Perfluoro-n-hexanoic acid	--	260	260 D
	Perfluoro-n-octanoic acid	--	150	150 D
	Perfluorooctane sulfonic acid	--	1,500	1,500 D
YTC-OFFP-18-DW-090921	Perfluorohexane sulfonic acid	--	230	230 D
	Perfluorooctane sulfonic acid	--	200	200 D
YTC-OFFD-07-DW-090821	Perfluorohexane sulfonic acid	160 E	160	160 D
	Perfluorooctane sulfonic acid	220 E	210	210 D

Note: With the exception of sample YTC-OFFD-07-DW-090821, the laboratory did not report the original analysis, only the diluted results.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: EPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2A Validation					
Holding times/Preservation		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field reagent blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate %R		X	X		
Internal standards		X		X	
Dilution Factor		X		X	
Moisture Content	X				X
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs or r^2		X		X	
Continuing calibration %Ds		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
Reconstructed ion chromatograms		X		X	
Quantitation Reports		X		X	
RT of sample compounds within the established RT windows		X		X	

DATA REVIEW REPORT

PFAS: EPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Transcription/calculations acceptable		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Jennifer Singer/Lyndi Mott, Arcadis

SIGNATURE:

A handwritten signature in black ink, appearing to read "Lyndi Mott", is written over a light pink rectangular background. Below the signature is a solid black horizontal line.

DATE: October 7, 2021

PEER REVIEW: Dennis Capria, Arcadis

DATE: October 7, 2021

Stage 3 / 4
PFAS Calibration Standards

SDG #: WI10062
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 10/7/2021
 Page: 1
 Validated by: LWM

Method: EPA 537 1.1

PFOS 9/17/2021 Calibration LCMSMS01 Page 269 of SDG WI10062

Cal Conc	ng/L	Std Area	IS Area	IS Conc ng/L	Area Ratio	Calculated RF	Avg RF	Calc Amount ng/L	%R Calc		Reported %R	
									Tvalue	ng/L		
46.4	14985	256173	1000	0.058496	1.2606816	1.235778	47.34	46.4	102.02	102	MATCH	
92.8	23552	227523	1000	0.103515	1.1154613	1.235778	83.76	92.8	90.26	90.3	MATCH	
185.6	60188	222895	1000	0.270028	1.4548949	1.235778	218.51	185.6	117.73	117.7	MATCH	
464	134881	233682	1000	0.577199	1.2439632	1.235778	467.07	464	100.66	100.7	MATCH	
928	289127	261795	1000	1.104402	1.1900887	1.235778	893.69	928	96.30	96.3	MATCH	
1856	535062	214835	1000	2.490572	1.3419029	1.235778	2015.39	1856	108.59	108.6	MATCH	
4640	1248664	225957	1000	5.526113	1.1909727	1.235778	4471.77	4640	96.37	96.4	MATCH	
9280	2470877	231025	1000	10.69528	1.1525086	1.235778	8654.69	9280	93.26	93.3	MATCH	
13920	3943542	225226	1000	17.50927	1.2578496	1.235778	14168.62	13920	101.79	101.8	MATCH	
18560	4780726	224090	1000	21.33396	1.1494588	1.235778	17263.58	18560	93.01	93.0	MATCH	
Avg						1.2357782	Match					

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Cal Conc ng/L	IS Conc ng/L	Conc Ratio (x)	Std Area	IS Area	Area Ratio (y)
46.4	1000	0.0464	14985	256173	0.0584956
92.8	1000	0.0928	23552	227523	0.1035148
185.6	1000	0.1856	60188	222895	0.2700285
464	1000	0.464	134881	233682	0.5771989
928	1000	0.928	289127	261795	1.1044023
1856	1000	1.856	535062	214835	2.4905718
4640	1000	4.64	1248664	225957	5.5261134
9280	1000	9.28	2470877	231025	10.69528
13920	1000	13.92	3943542	225226	17.509266
18560	1000	18.56	4780726	224090	21.333955

	Calculated	Reported
Correlation	0.9985597	
r ²	0.9971214	0.991

Lab calibration software used weighted concentration and forced through origin

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: WI10062
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 10/7/2021
 Page: 2
 Validated by: LWM

Method: EPA 537 1.1

ICV 500 9/17/2021 13:51

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Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFBS	463.15	442.5	104.67	104.7	MATCH
PFOA	463.32	500	92.66	92.7	MATCH
PFOS	412.17	462.75	89.07	89.1	MATCH

CCV 200 9/22/2021 11:15

Page 552 of SDG WI10062

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFBS	229.15	176.8	129.61	129.6	MATCH
PFOA	221.85	200	110.93	110.9	MATCH
PFOS	199.31	185.6	107.39	107.4	MATCH

Stage 3 / 4
PFAS LCS

SDG #: WI10062
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 10/7/2021
 Page: 3
 Validated by: LWM

Method: EPA 537 1.1

LCS WQ15909-002

Page 713 of SDG WI10062

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFBS	2362069	230610	1000	10.2427	1.925267	5320.15	250	21.28	21	101.34	100	MATCH
PFOA	6482970	1034361	1000	6.267609	1.036237	6048.43	250	24.19	24	100.81	101	MATCH
PFOS	1509823	230610	1000	6.547084	1.235778	5297.94	250	21.19	22	96.33	95	MATCH

Differences in %R may be due to rounding of true value

Calculated Amount ng/L = ((Area Ratio x IS Conc)/RF)

Calculated ng/L = ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS MS/MSD

SDG #: WI10062
Lab: Pace (Shealy)
Project: Yakima Training Center Off-post PFAS

Date: 10/7/2021
Page: 4
Validated by: LWM

Method: EPA 537 1.1

MS/MSD Sample ID YTC-OFFP-20-DW-090921

Page 735 and 746 of SDG WI10062

ANALYTE PFHxA

REPORTED MS %R	<u>69</u>
REPORTED MSD %R	<u>84</u>
REPORTED RPD	<u>6.8</u>

$$\%R = \frac{100 * (\text{MS Conc} - \text{Sample Conc})}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * |\text{MS \%R} - \text{MSD \%R}|}{\text{Average of MS MSD \%R}}$$

Sample Concentration	<u>14</u>
MS Concentration	<u>31</u>
MSD Concentration	<u>33</u>
MS TV	<u>24</u>
MSD TV	<u>22</u>

MS %R	<u>70.83</u>	MATCH
MSD %R	<u>86.36</u>	MATCH
RPD	<u>6.25</u>	MATCH

Differences in %R may be due to rounding of the true value

Stage 3 / 4
PFAS Sample Concentration

SDG #: WI10062
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 10/7/2021
 Page: 5
 Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-05-DW-090921 DF=50

Lab ID: WI10062-006

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LCMSMS01

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBS	346176	223366	1000	1.549815	1.925267	804.99	1	268	150.18	150	Match
PFOA	958437	1140855	1000	0.840104	1.036237	810.73	1	268	151.25	150	Match
PFOS	2182393	223366	1000	9.77048	1.235778	7906.34	1	268	1475.06	1500	Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS Surrogate Recoveries

SDG #: WI10062 Date: 10/7/2021
 Lab: Pace (Shealy) Page: 6
 Project: Yakima Training Center Off-post PFAS Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-05-DW-090921 DF=50 Lab ID: WI10062-006
 Surrogate 13C6-PFDA
 REPORTED Surr %R 102

Found concentration 3.7989 Page 142 of SDG WI10062
 True Value 3.730 (1000 ng/L x (1 ml/268 mls))
 %R 101.8 Match

Surrogate	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Raw Data Value ng/L
13C6-PFDA	18798	1140855	1000	0.016477	0.809207	20.36	1	268	3.7989	3.7989

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Slope)
 Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

CHAIN OF CUSTODY

**CORRECTED SAMPLE ANALYSIS DATA
SHEETS**

W



PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 125738

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Client: Arcadis / YTC
Report to Contact: jatravis@seres-es.com
Address:
City: State: Zip Code:
Project Name: YTC SAMPLING
Sampler's Signature: [Signature]
Printed Name: M. Andrews
Telephone No. / E-mail: 8126990152 / Olivia.Miller@arcadis.com
Analysis (Attach list if more space is needed)
Page 2 of 2
Lot # Bar Code (lab use only)

Table with columns: Project No. (30059933), PO No., Sample ID / Description, Collection Date(s), CoAnalysis Time (Military), Substrate, Matrix, No. of Containers by Preservative Type, and Remarks / Cooler I.D.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
Sample Disposal: [] Return to Client [] Disposal by Lab
Possible Hazard Identification: [] Non-Hazard [] Flammable [] Skin Irritant [] Poison [] Unknown
QC Requirements (Specify):
1. Relinquished by: M. Andrews Date: 9/19/21 Time: 1530
2. Relinquished by: Date: Time:
3. Relinquished by: Date: Time:
4. Relinquished by: Fed Ex Date: 9/10/21 Time: 1515
Note: All samples are retained for four weeks from receipt unless other arrangements are made.
LAB USE ONLY
Received on ice (Circle) [X] Yes [] No Ice Pack Receipt Temp: 2.2 °C Temp Blank [X] Y [] N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME000N2-01

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Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised: 9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Arcadis

Cooler Inspected by/date: KSC / 09/10/2021

Lot #: W110062

Means of receipt: <input type="checkbox"/> Pace <input type="checkbox"/> Client <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Other:	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1. Were custody seals present on the cooler?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	2. If custody seals were present, were they intact and unbroken?
pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA	
Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA	
2.2 / 2.2 °C NA / NA °C NA / NA °C NA / NA °C	
Method: <input checked="" type="checkbox"/> Temperature Blank <input type="checkbox"/> Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 6 °C	
Method of coolant: <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Ice Packs <input type="checkbox"/> Dry Ice <input type="checkbox"/> None	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	4. Is the commercial courier's packing slip attached to this form?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. Were proper custody procedures (relinquished/received) followed?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6. Were sample IDs listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7. Were sample IDs listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. Was collection date & time listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9. Was collection date & time listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. Did all container label information (ID, date, time) agree with the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. Were tests to be performed listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	13. Was adequate sample volume available?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	19. Were all applicable NH ₃ /TKN/cyanide/pheno/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	21. Was the quote number listed on the container label? If yes, Quote # 24328
Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)	
Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA	
Time of preservation NA. If more than one preservative is needed, please note in the comments below.	
Sample(s) NA were received with bubbles >6 mm in diameter.	
Samples(s) NA were received with TRC > 0.5 mg/L (if #19 is no) and were adjusted accordingly in sample receiving with sodium thiosulfate (Na ₂ S ₂ O ₃) with Shealy ID: NA	
SR barcode labels applied by: JRG2 Date: 09/10/2021	
Comments:	

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-001**

Description: **YTC-OFFP-20-DW-090921**

Matrix: **Aqueous**

Date Sampled: **09/09/2021 1208**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1151	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U UJ	7.4	3.7	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	13		1.9	0.95	0.37	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	68	S J-	1.9	0.95	0.37	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.74	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	2.9		1.9	0.95	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	14	S J-	1.9	0.95	0.37	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.74	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	3.7		1.9	0.95	0.37	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.74	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	28		1.9	0.95	0.37	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		98	70-130
13C3-HFPO-DA		80	70-130
13C6_PFDA		110	70-130
d5-EtFOSAA		113	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-002**

Description: **YTC-OFFP-11-DW-090821**

Matrix: **Aqueous**

Date Sampled: **09/08/2021 1729**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1222	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.6	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	5.2		1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	26		1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.7	J	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	7.6		1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.7	J	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	11		1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		91	70-130
13C3-HFPO-DA		81	70-130
13C6_PFDA		107	70-130
d5-EtFOSAA		101	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-003**

Description: **YTC-OFFP-17-DW-090821**

Matrix: **Aqueous**

Date Sampled: **09/08/2021 1754**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1233	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	2.1		1.8	0.90	0.36	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	11		1.8	0.90	0.36	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.73	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.2	J	1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	5.0		1.8	0.90	0.36	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.73	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	2.3		1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.73	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	8.9		1.8	0.90	0.36	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		84	70-130
13C3-HFPO-DA		72	70-130
13C6_PFDA		104	70-130
d5-EtFOSAA		101	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-004**

Description: **YTC-PAIC-PRE-DW-090921**

Matrix: **Aqueous**

Date Sampled: **09/09/2021 1013**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1244	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		99	70-130
13C3-HFPO-DA		90	70-130
13C6_PFDA		107	70-130
d5-EtFOSAA		102	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-005**

Description: **YTC-OFFP-03-DW-090921**

Matrix: **Aqueous**

Date Sampled: **09/09/2021 1321**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1254	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	3.8		1.9	0.95	0.37	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	5.1		1.9	0.95	0.37	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.61	J	1.9	0.95	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.9		1.9	0.95	0.37	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	2.1		1.9	0.95	0.37	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	2.9		1.9	0.95	0.37	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		86	70-130
13C3-HFPO-DA		71	70-130
13C6_PFDA		118	70-130
d5-EtFOSAA		112	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-006**

Description: **YTC-OFFP-05-DW-090921**

Matrix: **Aqueous**

Date Sampled: **09/09/2021 1039**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1305	MMM	09/20/2021 1859	15909
2	537.1	537.1	50	09/22/2021 1208	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	150	D	93	47	19	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1000	D	93	47	19	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	66		1.9	0.95	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	260	D	93	47	19	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	8.1		1.9	0.95	0.75	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	150	D	93	47	19	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1500	D	93	47	19	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		78	70-130		95	70-130
13C3-HFPO-DA		81	70-130		83	70-130
13C6_PFDA		116	70-130		102	70-130
d5-EtFOSAA		121	70-130		109	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-007**

Description: **YTC-OFFP-21-DW-090921**

Matrix: **Aqueous**

Date Sampled: **09/09/2021 0934**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	537.1	537.1	1	09/22/2021 1218	MMM	09/20/2021 1859	15909				

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	10		1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	52		1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	2.3		1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	11		1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	3.0		1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	29		1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		97	70-130
13C3-HFPO-DA		81	70-130
13C6_PFDA		124	70-130
d5-EtFOSAA		111	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-008**

Description: **YTC-OFFP-12-DW-090921**

Matrix: **Aqueous**

Date Sampled: **09/09/2021 1346**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1326	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	9.3		1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	59		1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	12		1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	22		1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	J	1.9	0.95	0.75	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	15		1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	49		1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		77	70-130
13C3-HFPO-DA		70	70-130
13C6_PFDA		120	70-130
d5-EtFOSAA		107	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-009**

Description: **YTC-FRB-1-090821**

Matrix: **Aqueous**

Date Sampled: **09/08/2021 1921**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1336	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	U	2.1	1.1	0.53	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	U	2.1	1.1	0.53	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.2	U	8.4	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.1	1.1	0.53	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.1	1.1	0.53	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.1	1.1	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	U	2.1	1.1	0.84	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.1	1.1	0.53	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.1	1.1	0.84	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.1	U	2.1	1.1	0.42	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		89	70-130
13C3-HFPO-DA		81	70-130
13C6_PFDA		92	70-130
d5-EtFOSAA		110	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-010**

Description: **YTC-OFFP-18-DW-090921**

Matrix: **Aqueous**

Date Sampled: **09/09/2021 1258**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1408	MMM	09/20/2021 1859	15909
2	537.1	537.1	5	09/22/2021 1229	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	18		1.8	0.90	0.36	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	230	D	9.0	4.5	1.8	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	3.7		1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	18		1.8	0.90	0.36	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	9.0		1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	200	D	9.0	4.5	1.8	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		90	70-130		96	70-130
13C3-HFPO-DA		77	70-130		92	70-130
13C6_PFDA		109	70-130		103	70-130
d5-EtFOSAA		106	70-130		117	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-011**

Description: **YTC-FD-2-DW-090921**

Matrix: **Aqueous**

Date Sampled: **09/09/2021**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1419	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		82	70-130
13C3-HFPO-DA		82	70-130
13C6_PFDA		103	70-130
d5-EtFOSAA		120	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-012**

Description: **YTC-OFFD-07-DW-090821**

Matrix: **Aqueous**

Date Sampled: **09/08/2021 1942**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1429	MMM	09/20/2021 1859	15909
2	537.1	537.1	5	09/22/2021 1240	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.4	3.7	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	15		1.9	0.95	0.37	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	160	E	1.9	0.95	0.37	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.74	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	9.5		1.9	0.95	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	13		1.9	0.95	0.37	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	2.0		1.9	0.95	0.74	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	11		1.9	0.95	0.37	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.74	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	220	E	1.9	0.95	0.37	ng/L	1

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		83	70-130		106	70-130
13C3-HFPO-DA		76	70-130		95	70-130
13C6_PFDA		114	70-130		130	70-130
d5-EtFOSAA		114	70-130	N	132	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-012**

Description: **YTC-OFFD-07-DW-090821**

Matrix: **Aqueous**

Date Sampled: **09/08/2021 1942**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1429	MMM	09/20/2021 1859	15909
2	537.1	537.1	5	09/22/2021 1240	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	4.7	UQ	9.3	4.7	2.3	ng/L	2
11-chloroeicosafluoro-3-oxadecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	4.7	UQ	9.3	4.7	2.3	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	19	UQ	37	19	9.3	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	4.7	UQ	9.3	4.7	2.3	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	4.7	UQ	9.3	4.7	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	4.7	UQ	9.3	4.7	2.3	ng/L	2
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	16	Q	9.3	4.7	1.9	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	160	DJ+	9.3	4.7	1.9	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	4.7	UQ	9.3	4.7	3.7	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	4.7	UQ	9.3	4.7	1.9	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	11	Q	9.3	4.7	1.9	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	18	Q	9.3	4.7	1.9	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	4.7	UQ	9.3	4.7	3.7	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	12	Q	9.3	4.7	1.9	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	4.7	UQ	9.3	4.7	1.9	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	4.7	UQ	9.3	4.7	2.3	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	4.7	UQ	9.3	4.7	3.7	ng/L	2
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	210	DJ+	9.3	4.7	1.9	ng/L	2

Surrogate	Run 1			Run 2		
	Q	% Recovery	Acceptance Limits	Q	% Recovery	Acceptance Limits
13C2_PFHxA		83	70-130		106	70-130
13C3-HFPO-DA		76	70-130		95	70-130
13C6_PFDA		114	70-130		130	70-130
d5-EtFOSAA		114	70-130	N	132	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10062-013**

Description: **YTC-OFFD-16-DW-090921**

Matrix: **Aqueous**

Date Sampled: **09/09/2021 1108**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/22/2021 1250	MMM	09/20/2021 1859	15909
2	537.1	537.1	1	10/02/2021 1704	MMM	10/01/2021 1741	17421

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.95	UQ	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.95	UQ	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	UQ	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	UQ	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	UQ	1.9	0.95	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	UQ	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.9	Q	1.9	0.95	0.37	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	7.4	Q	1.9	0.95	0.37	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	UQ	1.9	0.95	0.75	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	UQ	1.9	0.95	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.6	JQ	1.9	0.95	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	2.8	Q	1.9	0.95	0.37	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	UQ	1.9	0.95	0.75	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	2.3	Q	1.9	0.95	0.37	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	UQ	1.9	0.95	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	UQ	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	UQ	1.9	0.95	0.75	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	18	Q	1.9	0.95	0.37	ng/L	1

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		75	70-130	H	88	70-130
13C3-HFPO-DA	N	60	70-130	H	74	70-130
13C6_PFDA		112	70-130	H	119	70-130
d5-EtFOSAA		103	70-130	H	107	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: WI10062-013
Description: YTC-OFFD-16-DW-090921	Matrix: Aqueous
Date Sampled: 09/09/2021 1108	
Date Received: 09/10/2021	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/22/2021 1250	MMM	09/20/2021 1859	15909
2	537.1	537.1	1	10/02/2021 1704	MMM	10/01/2021 1741	17421

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	UH	1.9	0.95	0.48	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	UH	1.9	0.95	0.48	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	UH	7.6	3.8	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	UH	1.9	0.95	0.48	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	UH	1.9	0.95	0.38	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	UH	1.9	0.95	0.48	ng/L	2
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.7	HJ	1.9	0.95	0.38	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	7.0	H	1.9	0.95	0.38	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	UH	1.9	0.95	0.76	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	UH	1.9	0.95	0.38	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.7	HJ	1.9	0.95	0.38	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	3.2	H	1.9	0.95	0.38	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	UH	1.9	0.95	0.76	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	2.3	H	1.9	0.95	0.38	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	UH	1.9	0.95	0.38	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	UH	1.9	0.95	0.48	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	UH	1.9	0.95	0.76	ng/L	2
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	17	H	1.9	0.95	0.38	ng/L	2

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		75	70-130	H	88	70-130
13C3-HFPO-DA	N	60	70-130	H	74	70-130
13C6_PFDA		112	70-130	H	119	70-130
d5-EtFOSAA		103	70-130	H	107	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Yakima Training Center PFAS PA/SI

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #WI10065

Pace South Carolina

formerly Shealy Environmental Services

West Columbia, South Carolina

Report #42962R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY/

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) #WI10065 for samples collected in association with the Yakima Training Center Site. The review was conducted as a Stage 3/4 evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	TOC	MISC
YTC-OFFP-01-DW-090821	WI10065-001	Potable Water	9/8/2021		X		
YTC-OFFP-02-DW-090821	WI10065-002	Potable Water	9/8/2021		X		
YTC-OFFP-04-DW-090821	WI10065-003	Potable Water	9/8/2021		X		
YTC-OFFP-06-DW-090721	WI10065-004	Potable Water	9/7/2021		X		
YTC-OFFP-08-DW-090821	WI10065-005	Potable Water	9/8/2021		X		
YTC-OFFP-09-DW-090821	WI10065-006	Potable Water	9/8/2021		X		
YTC-OFFP-10-DW-090721	WI10065-007	Potable Water	9/7/2021		X		
YTC-OFFP-13-DW-090721	WI10065-008	Potable Water	9/7/2021		X		
YTC-OFFP-14-DW-090721	WI10065-009	Potable Water	9/7/2021		X		
YTC-OFFP-15-DW-090721	WI10065-010	Potable Water	9/7/2021		X		
YTC-OFFP-19-DW-090821	WI10065-011	Potable Water	9/8/2021		X		
YTC-FD-1-DW-090821	WI10065-012	Potable Water	9/8/2021	YTC-OFFP-19-DW-090821	X		
YTC-FRB-02-090921	WI10065-013	Potable Water	9/9/2021		X		

Note:

1. Stage 4 evaluation was performed on sample location YTC-OFFP-02-DW-090821.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location YTC-OFFP-02-DW-090821.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 1.1 for drinking water. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00216-06 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.1.1 and 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Per DoD General Data Validation Guidelines November 2019 Revision 1 Section 4.8 states; "The following provides a brief explanation of the DoD data validation qualifiers assigned to results during the data review process by a data validator. The reviewer should use these qualifiers, as applicable, unless other data qualifiers are specified in a project related document, such as a QAPP. If other qualifiers are used, a complete explanation of those qualifiers should accompany the data validation report." Below are the qualifier codes that may be applied in this validation report:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and

DATA REVIEW REPORT

provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 1.1	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were extracted and analyzed within the specified holding time criteria with the following noted:

Sample YTC-OFFP-19-DW-090821 was re-extracted and reanalyzed outside of the method-specified holding time (re-extraction performed 24 days from collection). The sample was re-extracted since the surrogate compound 13C3-HFPO-DA recovered below the acceptance limit in the original analysis of the sample (see Section 5.1 below). The results from the reanalysis confirmed the original analysis. The results from the original analysis of sample YTC-OFFP-19-DW-090821 were marked as reportable with qualification for the surrogate recovery as discussed in Section 5.1.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

ADONA was detected in method blank associated with batch 15848; however, the associated sample results were non-detect. No qualification of the sample results was required.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

All compounds associated with initial calibration and reported sample results were within the control limits.

DATA REVIEW REPORT

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit of 30%.

All compounds associated with CCV %D and reported sample results were within control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.3 Table B-15.

The ion transitions were as specified in DoD QSM 5.3.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 1.1 must be within 70% to 130% of the true value.

Sample locations associated with surrogate exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Surrogate	%R
YTC-OFFP-08-DW-090821 (50x dilution)	13C2_PFHxA	AC
	13C3-HFPO-DA	
	13C6_PFDA	
	d5-EtFOSAA	> 130%
YTC-OFFP-19-DW-090821	13C2_PFHxA	AC
	13C3-HFPO-DA	< 70% but > 10%
	13C6_PFDA	AC
	d5-EtFOSAA	

Note:

AC Acceptable

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 130%	Non-detect	No Action
	Detect	J+
< 70% but > 10%	Non-detect	UJ
	Detect	J-

DATA REVIEW REPORT

Control Limit	Sample Result	Qualification
< 10%	Non-detect	R
	Detect	J-

5.2 Injection Internal Standards

Injection internal standards must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard areas met specified criteria.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the EPA method 537 version 1.1 specified acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
YTC-OFFP-02-DW-090821	Perfluorooctane sulfonic acid	> 130%	AC

Note:

AC Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 130%	Non-detect	No Action
	Detect	J+
< 70% but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	R
	Detect	J-

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within EPA method 537 version 1.1 acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

DATA REVIEW REPORT

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 35% for water matrices and 50% for soils is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied for water matrices and three times the LOQ for soil matrices.

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
YTC-OFFP-19-DW-090821 / YTC-FD-1-DW-090821	Perfluoro-1-butane sulfonic acid	1.7 J	1.8 J	AC
	Perfluorohexane sulfonic acid	1.1 J	1.0 J	
	Perfluoro-n-octanoic acid	1.3 J	1.4 J	
	Perfluorooctane sulfonic acid	1.1 J	0.95 U	

Notes:

AC Acceptable

The differences in the results between the parent sample and field duplicate sample were acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-01-DW-090821	Perfluoro-1-butane sulfonic acid	--	62	62 D
	Perfluorohexane sulfonic acid	--	450	450 D
	Perfluoro-n-hexanoic acid	--	160	160 D
	Perfluorooctane sulfonic acid	--	460	460 D
YTC-OFFP-02-DW-090821	Perfluorohexane sulfonic acid	--	63	63 D
YTC-OFFP-06-DW-090721	Perfluorohexane sulfonic acid	--	220	220 D
	Perfluorooctane sulfonic acid	--	60	60 D
YTC-OFFP-08-DW-090821	Perfluoro-1-butane sulfonic acid	140 E	170	170 D
	Perfluorohexane sulfonic acid	820 E	1,200	1,200 D
	Perfluoro-n-hexanoic acid	170 E	240	240 D
	Perfluoro-n-octanoic acid	110 E	120	120 D

DATA REVIEW REPORT

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
	Perfluorooctane sulfonic acid	950 E	1,100	1,100 D
YTC-OFFP-13-DW-090721	Perfluorohexane sulfonic acid	--	82	82 D
	Perfluorooctane sulfonic acid	--	65	65 D
YTC-OFFP-14-DW-090721	Perfluorohexane sulfonic acid	--	160	160 D
YTC-OFFP-15-DW-090721	Perfluorohexane sulfonic acid	--	530	530 D
	Perfluoro-n-hexanoic acid	--	130	130 D
	Perfluorooctane sulfonic acid	--	560	560 D

Note: With the exception of sample YTC-OFFP-08-DW-090821, the laboratory did not report the original analysis, only the diluted result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: EPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2A Validation					
Holding times/Preservation		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X	X		
B. Equipment blanks	X				X
C. Field reagent blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate %R		X	X		
Internal standards		X		X	
Dilution Factor		X		X	
Moisture Content	X				X
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs or r ²		X		X	
Continuing calibration %Ds		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
Reconstructed ion chromatograms		X		X	
Quantitation Reports		X		X	
RT of sample compounds within the established RT windows		X		X	

DATA REVIEW REPORT

PFAS: EPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Transcription/calculations acceptable		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

- %R Percent recovery
- RPD Relative percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Jennifer Singer/Lyndi Mott, Arcadis

SIGNATURE:



DATE: October 7, 2021

PEER REVIEW: Dennis Capria, Arcadis

DATE: October 7, 2021

Stage 3 / 4
PFAS Calibration Standards

SDG #: WI10065
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 10/7/2021
 Page: 1
 Validated by: LWM

Method: EPA 537 1.1

PFOA 9/16/2021 Calibration LCMSMS02 Page 318 of SDG WI10065

Cal Conc	n	Std Area	IS Area	IS Conc ng/L	Area Ratio	Calculated RF	Avg RF/ Slope	Calc Amount ng/L	%R Calc		Reported %R	
									Tvalue	ng/L		Tvalue
50		38318	580611	1000	0.065996	1.3199199	1.023511	64.48	50	128.96	129	MATCH
100		71085	631131	1000	0.112631	1.1263113	1.023511	110.04	100	110.04	110	MATCH
200		132789	604949	1000	0.219504	1.0975223	1.023511	214.46	200	107.23	107.2	MATCH
500		310911	614444	1000	0.506004	1.0120076	1.023511	494.38	500	98.88	98.9	MATCH
1000		690996	694913	1000	0.994363	0.9943633	1.023511	971.52	1000	97.15	97.2	MATCH
2000		1257925	566624	1000	2.220035	1.1100174	1.023511	2169.04	2000	108.45	108.5	MATCH
5000		3089565	552835	1000	5.588584	1.1177169	1.023511	5460.21	5000	109.20	109.2	MATCH
10000		5625002	560283	1000	10.03957	1.0039573	1.023511	9808.95	10000	98.09	98.1	MATCH
15000		8525459	548948	1000	15.53054	1.0353693	1.023511	15173.79	15000	101.16	101.2	MATCH
20000		10562147	532397	1000	19.83886	0.9919428	1.023511	19383.14	20000	96.92	96.9	MATCH
						Avg RF	1.0809128	No Match.				

Lab software performed linear regression forced through origin

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Cal Conc ng/L	IS Conc ng/L	Conc Ratio (x)	Std Area	IS Area	Area Ratio (y)
50	1000	0.05	38318	580611	0.065996
100	1000	0.1	71085	631131	0.1126311
200	1000	0.2	132789	604949	0.2195045
500	1000	0.5	310911	614444	0.5060038
1000	1000	1	690996	694913	0.9943633
2000	1000	2	1257925	566624	2.2200348
5000	1000	5	3089565	552835	5.5885843
10000	1000	10	5625002	560283	10.039573
15000	1000	15	8525459	548948	15.53054
20000	1000	20	10562147	532397	19.838855

	Calculated	Reported	
Slope	1.0036521	1.023511	No Match
Correlation	0.9994264		
r ²	0.9988531	0.998	Match

Lab calibration software used weighted concentration and forced through origin

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: WI10065
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 10/7/2021
 Page: 2
 Validated by: LWM

Method: EPA 537 1.1

ICV 500 9/16/2021 19:47

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Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFBS	389.39	442.5	88.00	88	MATCH
PFOA	473.73	500	94.75	94.7	MATCH
PFOS	433.70	462.75	93.72	93.7	MATCH

CCV 200 9/21/2021 22:47

Page 989 of SDG WI10065

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFBS	182.21	176.8	103.06	103.1	MATCH
PFOA	213.64	200	106.82	106.8	MATCH
PFOS	194.35	185.6	104.71	104.7	MATCH

Stage 3 / 4
PFAS LCS

SDG #: WI10065
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 10/7/2021
 Page: 3
 Validated by: LWM

Method: EPA 537 1.1

LCS WQ15848-002

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Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFBS	1582950	143399	1000	11.03878	1.808664	6103.28	250	24.41	28	87.19	86	MATCH
PFOA	4891343	574249	1000	8.517808	1.023511	8322.15	250	33.29	32	104.03	104	MATCH
PFOS	1196735	143399	1000	8.345491	1.247861	6687.84	250	26.75	30	89.17	90	MATCH

Differences in %R may be due to rounding of true value

Calculated Amount ng/L = ((Area Ratio x IS Conc)/RF)

Calculated ng/L = ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS MS/MSD

SDG #: WI10065
Lab: Pace (Shealy)
Project: Yakima Training Center Off-post PFAS

Date: 10/7/2021
Page: 4
Validated by: LWM

Method: EPA 537 1.1

MS/MSD Sample ID YTC-OFFP-02-DW-090821

Page 1340 and 746 of SDG WI10065

ANALYTE PFHxS
REPORTED MS %R 138
REPORTED MSD %R 127
REPORTED RPD 0.97

$$\%R = \frac{100 * (\text{MS Conc} - \text{Sample Conc})}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * |\text{MS \%R} - \text{MSD \%R}|}{\text{Average of MS MSD \%R}}$$

Sample Concentration 69.027
MS Concentration 102.62
MSD Concentration 101.63
MS TV 24
MSD TV 26

MS %R 139.97 MATCH
MSD %R 125.40 MATCH
RPD 0.97 MATCH

Differences in %R may be due to rounding of the true value

Stage 3 / 4
PFAS Sample Concentration

SDG #: WI10065
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 10/7/2021
 Page: 5
 Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-02-DW-090821
 LCMSMS02

Lab ID: WI10065-002

Page 104-114 of SDG WI10065

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBS	862260	129958	1000	6.634913	1.808664	3668.41	1	293	12.52	13	Match
PFOA	1845602	579569	1000	3.184439	1.023511	3111.29	1	293	10.62	11	Match
PFOS	2834104	129958	1000	21.80785	1.247861	17476.18	1	293	59.65	60	Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS Surrogate Recoveries

SDG #: WI10065 Date: 10/7/2021
 Lab: Pace (Shealy) Page: 6
 Project: Yakima Training Center Off-post PFAS Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-02-DW-090821 Lab ID: WI10065-002
 Surrogate d5-EtFOSAA
 REPORTED Surr %R 100

Found concentration 17.041 Page 105 of SDG WI10065
 True Value 17.065 (5000 ng/L x (1 ml/293 mls))
 %R 99.9 Match

Surrogate	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Raw Data Value ng/L
d5-EtFOSAA	654121	795317	5000	0.822466	0.823619	4993.00	1	293	17.0410	17.041

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Slope)

Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

**CHAIN OF CUSTODY
CORRECTED SAMPLE ANALYSIS DATA
SHEETS**





PACE ANALYTICAL SERVICES, LLC
 106 Vantage Point Drive • West Columbia, SC 29172
 Telephone No. 803-791-9700 Fax No. 803-791-9111
 www.pacelabs.com

Number 125735

jatavis@seses.com

Client: **Accadis/YTC** Report to Contact: **Olivia Miller @ accadis.com**
 Telephone No. / E-mail: **803-791-9700 / oliviamiller@accadis.com**
 Address: _____ Analyte (Attach list if more space is needed): _____
 City: _____ State: _____ Zip Code: _____ Printed Name: **M. Andrews**
 Project Name: **YTC Sampling** Project No.: **30859933** P.O. No.: _____
 Sample ID / Description: _____ Collection Date(s): _____ Collection Time (Military): _____
 (Continues for each sample may be combined on one line.)

Quote No. _____
 Page **1** of **2**



W110065

KE52

Remarks / Cooler I.D.

Sample ID / Description (Continues for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Geochem. Comp. (G)	Matrix				No. of Contaminants by Preservative Type										PFAS (Method 531) (B) (Sample Water)		
				Asst	Asst	Asst	Asst	PCB	PCP	PCY	PCOY	PCP	PCOY	PCP	PCOY	PCP	PCOY			
YTC-OFFP-01-DW-090821	09-08-21	14:20	G	✓				2											X	
YTC-OFFP-02-DW-090821	09-08-21	10:27	G	✓				6											X	
YTC-OFFP-04-DW-090821	09-08-21	09:54	G	✓				2											X	
YTC-OFFP-06-DW-090721	09-07-21	13:40	G	✓				2											X	
YTC-OFFP-08-DW-090821	09-08-21	09:23	G	✓				2											X	
YTC-OFFP-09-DW-090821	09-08-21	14:48	G	✓				2											X	
YTC-OFFP-10-DW-090721	09-07-21	14:18	G	✓				2											X	
YTC-OFFP-13-DW-090721	09-07-21	14:53	G	✓				2											X	
YTC-OFFP-14-DW-090721	09-07-21	15:26	G	✓				2											X	
YTC-OFFP-15-DW-090721	09-07-21	16:05	G	✓				2											X	

MS / MSD

Turn Around Time Required (Prior lab approval required for expedited TAT):
 Standard Rush (Specify) _____

Sample Disposal: Return to Client Dispose by Lab

Possible Hazard Identification:
 Non-Hazard Flammable Skin Irritant Poison Unknown

QC Requirements (Specify):

1. Relinquished by: M. Andrews	Date: 7/9/21	Time: 1530	1. Received by:	Date:	Time:
2. Relinquished by:	Date:	Time:	2. Received by:	Date:	Time:
3. Relinquished by:	Date:	Time:	3. Received by:	Date:	Time:
4. Relinquished by: FedEx	Date: 9/10/21	Time: 1515	4. Laboratory received by: KSLC	Date: 9/10/21	Time: 1515

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
 Received on Ice (Circle) Yes No Ice Pack Receipt Temp: **3.8** °C

Document Number: ME03N2-01

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

PACE ANALYTICAL SERVICES, LLC



Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised: 9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Arcadis

Cooler Inspected by/date: KSC / 09/10/2021

Lot #: W110665

Means of receipt: <input type="checkbox"/> Pace <input type="checkbox"/> Client <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Other:	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1. Were custody seals present on the cooler?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	2. If custody seals were present, were they intact and unbroken?
pH Strip ID: <u>NA</u> Chlorine Strip ID: <u>NA</u> Tested by: <u>NA</u>	
Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: <u>NA</u> 3.8 / 3.8 °C NA / NA °C NA / NA °C NA / NA °C	
Method: <input checked="" type="checkbox"/> Temperature Blank <input type="checkbox"/> Against Bottles IR Gun ID: <u>5</u> IR Gun Correction Factor: <u>0</u> °C	
Method of coolant: <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Ice Packs <input type="checkbox"/> Dry Ice <input type="checkbox"/> None	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	4. Is the commercial courier's packing slip attached to this form?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. Were proper custody procedures (relinquished/received) followed?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6. Were sample IDs listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7. Were sample IDs listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. Was collection date & time listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9. Was collection date & time listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. Did all container label information (ID, date, time) agree with the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. Were tests to be performed listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	13. Was adequate sample volume available?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	19. Were all applicable NH ₃ /TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	21. Was the quote number listed on the container label? If yes, Quote # <u>24028</u>
Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace)	
Sample(s) <u>NA</u> were received incorrectly preserved and were adjusted accordingly in sample receiving with <u>NA</u> mL of circle one: H ₂ SO ₄ , HNO ₃ , HCl, NaOH using SR # <u>NA</u>	
Time of preservation <u>NA</u> . If more than one preservative is needed, please note in the comments below.	
Sample(s) <u>NA</u> were received with bubbles >6 mm in diameter.	
Samples(s) <u>NA</u> were received with TRC > 0.5 mg/L (if #19 is no) and were adjusted accordingly in sample receiving with sodium thiosulfate (Na ₂ S ₂ O ₃) with Shealy ID: <u>NA</u>	
SR barcode labels applied by: <u>JRG2</u> Date: <u>09/10/2021</u>	

Comments:

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10065-001**

Description: **YTC-OFFP-01-DW-090821**

Matrix: **Aqueous**

Date Sampled: **09/08/2021 1420**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/22/2021 1311	MMM	09/20/2021 1859	15909
2	537.1	537.1	20	09/26/2021 1640	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.8	3.9	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	62	D	39	20	7.8	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	450	D	39	20	7.8	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.78	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	43		2.0	1.0	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	160	D	39	20	7.8	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	2.7		2.0	1.0	0.78	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	66		2.0	1.0	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.78	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	460	D	39	20	7.8	ng/L	2

Surrogate	Run 1			Run 2		
	Q	% Recovery	Acceptance Limits	Q	% Recovery	Acceptance Limits
13C2_PFHxA		90	70-130		105	70-130
13C3-HFPO-DA		85	70-130		106	70-130
13C6_PFDA		124	70-130		116	70-130
d5-EtFOSAA		119	70-130		120	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10065-002**

Description: **YTC-OFFP-02-DW-090821**

Matrix: **Aqueous**

Date Sampled: **09/08/2021 1027**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 2340	JJG	09/20/2021 1400	15848
2	537.1	537.1	5	09/24/2021 1238	MMM	09/20/2021 1400	15848

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.85	U	1.7	0.85	0.34	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	13		1.7	0.85	0.34	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	63	D	8.5	4.3	1.7	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.85	U	1.7	0.85	0.68	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.85	U	1.7	0.85	0.34	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	6.1		1.7	0.85	0.34	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	21		1.7	0.85	0.34	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.3	J	1.7	0.85	0.68	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	11		1.7	0.85	0.34	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.85	U	1.7	0.85	0.34	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.85	U	1.7	0.85	0.68	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	60	S J+	1.7	0.85	0.34	ng/L	1

Surrogate	Run 1			Run 2		
	Q	% Recovery	Acceptance Limits	Q	% Recovery	Acceptance Limits
13C2_PFHxA		87	70-130		87	70-130
13C3-HFPO-DA		86	70-130		70	70-130
13C6_PFDA		99	70-130		92	70-130
d5-EtFOSAA		100	70-130		85	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10065-003**

Description: **YTC-OFFP-04-DW-090821**

Matrix: **Aqueous**

Date Sampled: **09/08/2021 0954**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	537.1	537.1	5	09/22/2021 1333	MMM	09/20/2021 1859	15909				
Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run		
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	4.8	U	9.6	4.8	2.4	ng/L	1		
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	4.8	U	9.6	4.8	2.4	ng/L	1		
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	19	U	38	19	9.6	ng/L	1		
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	4.8	U	9.6	4.8	2.4	ng/L	1		
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	4.8	U	9.6	4.8	1.9	ng/L	1		
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	4.8	U	9.6	4.8	2.4	ng/L	1		
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	22		9.6	4.8	1.9	ng/L	1		
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	83		9.6	4.8	1.9	ng/L	1		
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	4.8	U	9.6	4.8	3.8	ng/L	1		
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	4.8	U	9.6	4.8	1.9	ng/L	1		
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	7.2	J	9.6	4.8	1.9	ng/L	1		
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	22		9.6	4.8	1.9	ng/L	1		
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	4.8	U	9.6	4.8	3.8	ng/L	1		
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	9.3	J	9.6	4.8	1.9	ng/L	1		
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	4.8	U	9.6	4.8	1.9	ng/L	1		
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	4.8	U	9.6	4.8	2.4	ng/L	1		
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	4.8	U	9.6	4.8	3.8	ng/L	1		
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	24		9.6	4.8	1.9	ng/L	1		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		98	70-130
13C3-HFPO-DA		80	70-130
13C6_PFDA		103	70-130
d5-EtFOSAA		119	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10065-004**

Description: **YTC-OFFP-06-DW-090721**

Matrix: **Aqueous**

Date Sampled: **09/07/2021 1340**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/22/2021 0012	JJG	09/20/2021 1400	15848
2	537.1	537.1	10	09/24/2021 1248	MMM	09/20/2021 1400	15848

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.85	U	1.7	0.85	0.34	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	35		1.7	0.85	0.34	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	220	D	17	8.5	3.4	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.85	U	1.7	0.85	0.69	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.85	U	1.7	0.85	0.34	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.1	J	1.7	0.85	0.34	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	5.9		1.7	0.85	0.34	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.85	U	1.7	0.85	0.69	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	2.4		1.7	0.85	0.34	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.85	U	1.7	0.85	0.34	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.85	U	1.7	0.85	0.69	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	60	D	17	8.5	3.4	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		87	70-130		100	70-130
13C3-HFPO-DA		80	70-130		84	70-130
13C6_PFDA		115	70-130		104	70-130
d5-EtFOSAA		120	70-130		119	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10065-005**

Description: **YTC-OFFP-08-DW-090821**

Matrix: **Aqueous**

Date Sampled: **09/08/2021 0923**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1512	MMM	09/20/2021 1859	15909
2	537.1	537.1	50	09/22/2021 1404	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-1-butano sulfonic acid (PFBS)	375-73-5	537.1	140	E	1.9	0.95	0.39	ng/L	1
Perfluorohexano sulfonic acid (PFHxS)	355-46-4	537.1	820	E	1.9	0.95	0.39	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	51		1.9	0.95	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	170	E	1.9	0.95	0.39	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	7.9		1.9	0.95	0.77	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	110	E	1.9	0.95	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluorooctano sulfonic acid (PFOS)	1763-23-1	537.1	950	E	1.9	0.95	0.39	ng/L	1

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		81	70-130		107	70-130
13C3-HFPO-DA		80	70-130		92	70-130
13C6_PFDA		114	70-130		100	70-130
d5-EtFOSAA		106	70-130	N	132	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10065-005**

Description: **YTC-OFFP-08-DW-090821**

Matrix: **Aqueous**

Date Sampled: **09/08/2021 0923**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1512	MMM	09/20/2021 1859	15909
2	537.1	537.1	50	09/22/2021 1404	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	49	UQ	97	49	24	ng/L	2
11-chloroeicosafluoro-3-oxaundecanoic-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	49	UQ	97	49	24	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	200	UQ	390	200	97	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	49	UQ	97	49	24	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	49	UQ	97	49	19	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	49	UQ	97	49	24	ng/L	2
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	170	Q DJ+	97	49	19	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1200	Q DJ+	97	49	19	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	49	UQ	97	49	39	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	49	UQ	97	49	19	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	66	Q	97	49	19	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	240	Q DJ+	97	49	19	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	49	UQ	97	49	39	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	120	Q DJ+	97	49	19	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	49	UQ	97	49	19	ng/L	2
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	537.1	49	UQ	97	49	24	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	49	UQ	97	49	39	ng/L	2
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1100	Q DJ+	97	49	19	ng/L	2

Surrogate	Run 1			Run 2		
	Q	% Recovery	Acceptance Limits	Q	% Recovery	Acceptance Limits
13C2_PFHxA		81	70-130		107	70-130
13C3-HFPO-DA		80	70-130		92	70-130
13C6_PFDA		114	70-130		100	70-130
d5-EtFOSAA		106	70-130	N	132	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10065-006**

Description: **YTC-OFFP-09-DW-090821**

Matrix: **Aqueous**

Date Sampled: **09/08/2021 1448**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	537.1	537.1	1	09/22/2021 0022	JJG	09/20/2021 1400	15848				
Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run		
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.46	ng/L	1		
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1		
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.3	3.7	1.8	ng/L	1		
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.46	ng/L	1		
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.37	ng/L	1		
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1		
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	0.85	J	1.8	0.90	0.37	ng/L	1		
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	3.3		1.8	0.90	0.37	ng/L	1		
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.73	ng/L	1		
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.37	ng/L	1		
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.1	J	1.8	0.90	0.37	ng/L	1		
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.2	J	1.8	0.90	0.37	ng/L	1		
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.73	ng/L	1		
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.2	J	1.8	0.90	0.37	ng/L	1		
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.37	ng/L	1		
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.46	ng/L	1		
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.73	ng/L	1		
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	2.4		1.8	0.90	0.37	ng/L	1		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		86	70-130
13C3-HFPO-DA		83	70-130
13C6_PFDA		108	70-130
d5-EtFOSAA		109	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10065-007**

Description: **YTC-OFFP-10-DW-090721**

Matrix: **Aqueous**

Date Sampled: **09/07/2021 1418**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/22/2021 0033	JJG	09/20/2021 1400	15848

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.85	U	1.7	0.85	0.34	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	5.9		1.7	0.85	0.34	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	59		1.7	0.85	0.34	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.85	U	1.7	0.85	0.69	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.85	U	1.7	0.85	0.34	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.83	J	1.7	0.85	0.34	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	2.6		1.7	0.85	0.34	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.85	U	1.7	0.85	0.69	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.9		1.7	0.85	0.34	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.85	U	1.7	0.85	0.34	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.85	U	1.7	0.85	0.43	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.85	U	1.7	0.85	0.69	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	37		1.7	0.85	0.34	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		106	70-130
13C3-HFPO-DA		92	70-130
13C6_PFDA		113	70-130
d5-EtFOSAA		112	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10065-008**

Description: **YTC-OFFP-13-DW-090721**

Matrix: **Aqueous**

Date Sampled: **09/07/2021 1453**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/22/2021 0044	JJG	09/20/2021 1400	15848
2	537.1	537.1	5	09/24/2021 1259	MMM	09/20/2021 1400	15848

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.85	U	1.7	0.85	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.85	U	1.7	0.85	0.42	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.4	U	6.7	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.85	U	1.7	0.85	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.85	U	1.7	0.85	0.33	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.85	U	1.7	0.85	0.42	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	6.7		1.7	0.85	0.33	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	82	D	8.3	4.2	1.7	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.85	U	1.7	0.85	0.67	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.85	U	1.7	0.85	0.33	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	7.3		1.7	0.85	0.33	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	14		1.7	0.85	0.33	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.89	J	1.7	0.85	0.67	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	9.3		1.7	0.85	0.33	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.85	U	1.7	0.85	0.33	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.85	U	1.7	0.85	0.42	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.85	U	1.7	0.85	0.67	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	65	D	8.3	4.2	1.7	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		94	70-130		90	70-130
13C3-HFPO-DA		86	70-130		80	70-130
13C6_PFDA		101	70-130		93	70-130
d5-EtFOSAA		102	70-130		111	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10065-009**

Description: **YTC-OFFP-14-DW-090721**

Matrix: **Aqueous**

Date Sampled: **09/07/2021 1526**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/22/2021 0055	JJG	09/20/2021 1400	15848
2	537.1	537.1	10	09/24/2021 1309	MMM	09/20/2021 1400	15848

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	16		1.8	0.90	0.36	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	160	D	18	9.0	3.6	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.8		1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	9.1		1.8	0.90	0.36	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.9		1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	14		1.8	0.90	0.36	ng/L	1

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		86	70-130		100	70-130
13C3-HFPO-DA		81	70-130		93	70-130
13C6_PFDA		121	70-130		116	70-130
d5-EtFOSAA		114	70-130		127	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10065-010**

Description: **YTC-OFFP-15-DW-090721**

Matrix: **Aqueous**

Date Sampled: **09/07/2021 1605**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/22/2021 0105	JJG	09/20/2021 1400	15848
2	537.1	537.1	50	09/24/2021 1320	MMM	09/20/2021 1400	15848

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.85	U	1.7	0.85	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.85	U	1.7	0.85	0.44	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.85	U	1.7	0.85	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.85	U	1.7	0.85	0.35	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.85	U	1.7	0.85	0.44	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	54		1.7	0.85	0.35	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	530	D	87	44	17	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.4	J	1.7	0.85	0.70	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.85	U	1.7	0.85	0.35	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	45		1.7	0.85	0.35	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	130	D	87	44	17	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	3.9		1.7	0.85	0.70	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	58		1.7	0.85	0.35	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.85	U	1.7	0.85	0.35	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.85	U	1.7	0.85	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.85	U	1.7	0.85	0.70	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	560	D	87	44	17	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		92	70-130		91	70-130
13C3-HFPO-DA		88	70-130		82	70-130
13C6_PFDA		100	70-130		100	70-130
d5-EtFOSAA		92	70-130		108	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: WI10065-011
Description: YTC-OFFP-19-DW-090821	Matrix: Aqueous
Date Sampled: 09/08/2021 1116	
Date Received: 09/10/2021	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/22/2021 1415	MMM	09/20/2021 1859	15909
2	537.1	537.1	1	10/02/2021 1715	MMM	10/01/2021 1741	17421

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.90	UQ	1.8	0.90	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.90	UQ	1.8	0.90	0.44	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.6	UQ	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	UQ	1.8	0.90	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	UQ	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	UQ	1.8	0.90	0.44	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.7	JQ	1.8	0.90	0.36	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.1	JQ	1.8	0.90	0.36	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	UQ	1.8	0.90	0.71	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	UQ	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.39	JQ	1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.77	JQ	1.8	0.90	0.36	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	UQ	1.8	0.90	0.71	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.3	JQ	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	UQ	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	UQ	1.8	0.90	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	UQ	1.8	0.90	0.71	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.1	JQ	1.8	0.90	0.36	ng/L	1

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		83	70-130	H	98	70-130
13C3-HFPO-DA	N	64	70-130	H	85	70-130
13C6_PFDA		99	70-130	H	113	70-130
d5-EtFOSAA		102	70-130	H	118	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: WI10065-011
Description: YTC-OFFP-19-DW-090821	Matrix: Aqueous
Date Sampled: 09/08/2021 1116	
Date Received: 09/10/2021	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/22/2021 1415	MMM	09/20/2021 1859	15909
2	537.1	537.1	1	10/02/2021 1715	MMM	10/01/2021 1741	17421

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	UH	1.9	0.95	0.47	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	UH	1.9	0.95	0.47	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	UH	7.5	3.8	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	UH	1.9	0.95	0.47	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	UH	1.9	0.95	0.37	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	UH	1.9	0.95	0.47	ng/L	2
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.5	HJ	1.9	0.95	0.37	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	0.88	HJ	1.9	0.95	0.37	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	UH	1.9	0.95	0.75	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	UH	1.9	0.95	0.37	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.42	HJ	1.9	0.95	0.37	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.85	HJ	1.9	0.95	0.37	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	UH	1.9	0.95	0.75	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.3	HJ	1.9	0.95	0.37	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	UH	1.9	0.95	0.37	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	UH	1.9	0.95	0.47	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	UH	1.9	0.95	0.75	ng/L	2
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.89	HJ	1.9	0.95	0.37	ng/L	2

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		83	70-130	H	98	70-130
13C3-HFPO-DA	N	64	70-130	H	85	70-130
13C6_PFDA		99	70-130	H	113	70-130
d5-EtFOSAA		102	70-130	H	118	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10065-012**

Description: **YTC-FD-1-DW-090821**

Matrix: **Aqueous**

Date Sampled: **09/08/2021**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1533	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.8	J	1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.0	J	1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.38	J	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.89	J	1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.4	J	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.94	J	1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		94	70-130
13C3-HFPO-DA		79	70-130
13C6_PFDA		108	70-130
d5-EtFOSAA		106	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **WI10065-013**

Description: **YTC-FRB-02-090921**

Matrix: **Aqueous**

Date Sampled: **09/09/2021 1405**

Date Received: **09/10/2021**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	09/21/2021 1544	MMM	09/20/2021 1859	15909

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		90	70-130
13C3-HFPO-DA		79	70-130
13C6_PFDA		107	70-130
d5-EtFOSAA		98	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #XA25009

Analyses Performed By:

Pace South Carolina

formerly Shealy Environmental Services

West Columbia, South Carolina

Report #44396R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # XA25009 for samples collected in association with the Yakima Training Center Site. The review was conducted as a Stage 3/4 evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-65-DW-012122	XA25009-001	Potable water	1/21/2022		X
YTC-FRB-01-012022	XA25009-002	Potable water	1/20/2022		X
YTC-OFFP-29-DW-012222	XA25009-003	Potable water	1/22/2022		X
YTC-OFFP-25-DW-012222	XA25009-004	Potable water	1/22/2022		X
YTC-OFFP-64-DW-012122	XA25009-005	Potable water	1/21/2022		X
YTC-OFFP-61-DW-012122	XA25009-006	Potable water	1/21/2022		X
YTC-OFFP-44-DW-012022	XA25009-007	Potable water	1/20/2022		X
YTC-OFFP-56-DW-012122	XA25009-008	Potable water	1/21/2022		X
YTC-OFFP-71-DW-012122	XA25009-009	Potable water	1/21/2022		X
YTC-OFFP-74-DW-012422	XA25009-010	Potable water	1/24/2022		X
YTC-FRB-02-012122	XA25009-011	Potable water	1/21/2022		X
YTC-OFFP-73-DW-012422	XA25009-012	Potable water	1/24/2022		X
YTC-OFFP-70-DW-012122	XA25009-013	Potable water	1/21/2022		X
YTC-OFFP-66-DW-012122	XA25009-014	Potable water	1/21/2022		X
YTC-OFFP-62-DW-012122	XA25009-015	Potable water	1/21/2022		X
YTC-OFFP-55-DW-012122	XA25009-016	Potable water	1/21/2022		X
YTC-FRB-03-012222	XA25009-017	Potable water	1/22/2022		X
YTC-OFFP-60-DW-012122	XA25009-018	Potable water	1/21/2022		X
YTC-OFFP-63-DW-012122	XA25009-019	Potable water	1/21/2022		X
YTC-OFFP-67-DW-012122	XA25009-020	Potable water	1/21/2022		X

Note:

1. Stage 4 validation was performed on sample locations YTC-OFFP-65-DW-012122 and YTC-OFFP-70-DW-012122.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 1.1 for drinking water. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00216-06 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC PFAS, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Washington, August 2021, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance

DATA REVIEW REPORT

or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 1.1	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration met criteria, and the calibration standards and initial calibration verification (ICV) standards were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

DATA REVIEW REPORT

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in USEPA method 537 version 1.1 Table 4.

The ion transitions were as specified in method 537 version 1.1.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 1.1 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater

The laboratory performed MS analyses and lab duplicate analyses in replacement of MS/MSD analysis.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
YTC-OFFP-60-DW-012122	Perfluorohexanesulfonic acid	SR>4X	--
	Perfluorohexanoic acid	SR>4X	--
	Perfluorononanoic acid	< 70% but >10%	--
	Perfluorooctanoic acid	SR>4X	--
	Perfluorotridecanoic acid	< 70% but >10%	--

DATA REVIEW REPORT

Sample Locations	Compound	MS Recovery	MSD Recovery
	Perfluorooctanesulfonic acid	SR>4X	--

Note:

SR>4X Sample result is greater than 4 times the added spike

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 130%	Non-detect	No Action
	Detect	J+
< 70% but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	X or R
	Detect	J-
SR>4X: Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

The laboratory duplicate analysis performed on sample locations YTC-OFFP-74-DW-012422 and YTC-OFFP-67-DW-012122 exhibited RPD within the method specified control limits.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A method specified control limit of 30% for potable water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

A field duplicate was not collected for a sample location associated with this SDG.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

DATA REVIEW REPORT

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-65-DW-012122	Perfluorobutanesulfonic acid	--	74	74 D
	Perfluorohexanesulfonic acid	--	580	580 D
	Perfluorohexanoic acid	--	140	140 D
	Perfluorooctanoic acid	--	92	92 D
	Perfluorooctanesulfonic acid	--	390	390 D
YTC-OFFP-61-DW-012122	Perfluorohexanesulfonic acid	--	140	140 D
	Perfluorooctanesulfonic acid	--	86	86 D
YTC-OFFP-56-DW-012122	Perfluorohexanesulfonic acid	--	510	510 D
	Perfluorohexanoic acid	--	150	150 D
	Perfluorooctanesulfonic acid	--	410	410 D
YTC-OFFP-74-DW-012422	Perfluorohexanesulfonic acid	--	270	270 D
	Perfluorooctanesulfonic acid	--	200	200 D
YTC-OFFP-73-DW-012422	Perfluorobutanesulfonic acid	--	71	71 D
	Perfluorohexanesulfonic acid	--	530	530 D
	Perfluorohexanoic acid	--	110	110 D
	Perfluorooctanesulfonic acid	--	410	410 D
YTC-OFFP-70-DW-012122	Perfluorohexanesulfonic acid	--	410	410 D
	Perfluorohexanoic acid	--	31	31 D
	Perfluorooctanesulfonic acid	--	130	130 D
YTC-OFFP-66-DW-012122	Perfluorobutanesulfonic acid	--	110	110 D
	Perfluorohexanesulfonic acid	--	960	960 D
	Perfluorohexanoic acid	--	200	200 D
	Perfluorooctanoic acid	--	120	120 D
	Perfluorooctanesulfonic acid	--	800	800 D
YTC-OFFP-62-DW-012122	Perfluorobutanesulfonic acid	--	120	120 D
	Perfluorohexanesulfonic acid	--	1000	1000 D
	Perfluorohexanoic acid	--	210	210 D
	Perfluorooctanoic acid	--	130	130 D
	Perfluorooctanesulfonic acid	--	740	740 D
YTC-OFFP-55-DW-012122	Perfluorobutanesulfonic acid	--	75	75 D
	Perfluorohexanesulfonic acid	--	570	570 D

DATA REVIEW REPORT

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
	Perfluorohexanoic acid	--	170	170 D
	Perfluorooctanesulfonic acid	--	510	510 D
YTC-OFFP-60-DW-012122	Perfluorohexanesulfonic acid	--	430	430 D
	Perfluorohexanoic acid	--	110	110 D
	Perfluorooctanesulfonic acid	--	320	320 D
YTC-OFFP-63-DW-012122	Perfluorohexanesulfonic acid	--	460	460 D
	Perfluorohexanoic acid	--	120	120 D
	Perfluorooctanesulfonic acid	--	330	330 D
YTC-OFFP-67-DW-012122	Perfluorohexanesulfonic acid	--	180	180 D
	Perfluorooctanesulfonic acid	--	140	140 D

Note: The laboratory did not report the original analysis; only the diluted result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range.	D

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field reagent blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate(MSD) %R	X				X
Laboratory Duplicate Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Moisture Content	X				X
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %R		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
D. Ion Ratio %R		X		X	
E. Transcription/calculations acceptable		X		X	
F. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

- %RSD Relative standard deviation
- %R Percent recovery
- RPD Relative percent difference
- %D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Lyndi Mott, Arcadis

SIGNATURE:



DATE: February 2, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: February 3, 2022

Stage 3 / 4
PFAS Calibration Standards

SDG #: XA25009
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/2/2022
 Page: 1
 Validated by: LWM

Method: EPA 537 1.1

PFOA 1/27/2022 Calibration

LCMSMS01

Page 734-840 of SDG XA25009

Cal Conc ng/L	Std Area	IS Area	IS Conc ng/L	Area Ratio	Calculated RF	Avg RF/ Slope	Calc Amount ng/L	%R Calc		Reported %R	
								Tvalue	ng/L		
50	64537	1236050	1000	0.052212	1.0442458	0.993422	52.56	50	105.12	105.1	MATCH
100	124910	1164295	1000	0.107284	1.0728381	0.993422	107.99	100	107.99	108	MATCH
200	243799	1149821	1000	0.212032	1.0601607	0.993422	213.44	200	106.72	106.7	MATCH
500	561095	1173069	1000	0.478314	0.9566274	0.993422	481.48	500	96.30	96.3	MATCH
1000	1109457	1117253	1000	0.993022	0.9930222	0.993422	999.60	1000	99.96	100	MATCH
2000	2263722	1123106	1000	2.015591	1.0077953	0.993422	2028.94	2000	101.45	101.4	MATCH
5000	5614946	1093020	1000	5.137094	1.0274187	0.993422	5171.11	5000	103.42	103.4	MATCH
10000	9390194	1003745	1000	9.355159	0.9355159	0.993422	9417.10	10000	94.17	94.2	MATCH
15000	13091450	971572	1000	13.4745	0.8983002	0.993422	13563.73	15000	90.42	90.4	MATCH
20000	16267026	866839	1000	18.76591	0.9382957	0.993422	18890.17	20000	94.45	94.5	MATCH
Avg RF					0.993422	Match					

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Cal Conc ng/L	IS Conc ng/L	Conc Ratio (x)	Conc	Area Ratio (y)	
50	1000	0.05	64537	1236050	0.0522123
100	1000	0.1	124910	1164295	0.1072838
200	1000	0.2	243799	1149821	0.2120321
500	1000	0.5	561095	1173069	0.4783137
1000	1000	1	1109457	1117253	0.9930222
2000	1000	2	2263722	1123106	2.0155907
5000	1000	5	5614946	1093020	5.1370936
10000	1000	10	9390194	1003745	9.3551589
15000	1000	15	13091450	971572	13.474503
20000	1000	20	16267026	866839	18.765914

	Calculated	Reported	
Slope	0.9231465	0.993422	No Match
Correlation	0.9994013	--	
r ²	0.9988029	0.995	Match

Lab calibration software used weighted concentration and forced through origin

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: XA25009
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/2/2022
 Page: 2
 Validated by: LWM

Method: EPA 537 1.1

ICV 500 1/27/2022 03:21 Page 857 of SDG XA25009
 LCMSMS01

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFBS	464.94	442.5	105.07	105.1	MATCH
PFOA	515.55	500	103.11	103.1	MATCH
PFOS	458.77	462.75	99.14	99.1	MATCH

CCV 200 1/29/2022 15:04 Page 900 of SDG XA25009
 LCMSMS01

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFBS	202.46	176.8	114.51	114.5	MATCH
PFOA	212.86	200	106.43	106.4	MATCH
PFOS	182.91	185.6	98.55	98.5	MATCH

ICV 500 1/19/2022 15:55 Page 717 of SDG XA25009
 LCMSMS02

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFBS	457.11	442.5	103.30	103.3	MATCH
PFHpA	526.7	500	105.34	105.3	MATCH
PFNA	513.33	500	102.67	102.7	MATCH

CCV 1000 1/30/2022 16:57 Page 935 of SDG XA25009

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFBS	879.88	884	99.53	99.5	MATCH
PFHpA	885.6	1000	88.56	88.6	MATCH
PFNA	844.67	1000	84.47	84.5	MATCH

Stage 3 / 4
PFAS LCS

SDG #: XA25009
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/2/2022
 Page: 3
 Validated by: LWM

Method: EPA 537 1.1

LCS XQ29790-002

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Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFBS	2932739	256154	1000	11.44912	1.61721	7079.55	250	28.32	28	101.14	100	MATCH
PFOA	7253618	906033	1000	8.005909	0.993422	8058.92	250	32.24	32	100.74	101	MATCH
PFOS	2024907	256154	1000	7.905038	1.079255	7324.53	250	29.30	30	97.66	99	MATCH

LCS XQ30093-002

Page 1205 of SDG XA25009

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFBS	355498	232283	1000	1.530452	1.822347	839.82	250	3.36	4	95.98	95	MATCH
PFHpA	904971	851602	1000	1.062669	1.061595	1001.01	250	4.00	4	100.10	100	MATCH
PFNA	1001225	851602	1000	1.175696	1.1873	990.23	250	3.96	4	99.02	99	MATCH

Differences in %R may be due to rounding of true value

Calculated Amount ng/L = ((Area Ratio x IS Conc)/RF)

Calculated ng/L = ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS MS/MSD

SDG #: XA25009
Lab: Pace (Shealy)
Project: Yakima Training Center Off-post PFAS

Date: 2/2/2022
Page: 4
Validated by: LWM

Method: EPA 537 1.1

MS/MSD Sample ID YTC-OFFP-60-DW-012122

Page 1222 of SDG XA25009

ANALYTE PFNA

REPORTED MS %R 68

REPORTED MSD %R NA

REPORTED RPD NA

$$\%R = \frac{100 * (\text{MS Conc} - \text{Sample Conc})}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * |\text{MS \%R} - \text{MSD \%R}|}{\text{Average of MS MSD \%R}}$$

Sample Concentration 3.5
MS Concentration 6.2
MSD Concentration _____
MS TV 4.0
MSD TV _____

MS %R 67.50 MATCH
MSD %R _____
RPD _____

Differences in %R may be due to rounding of the true value

Stage 3 / 4
PFAS Sample Concentration

SDG #: XA25009
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/2/2022
 Page: 5
 Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-65-DW-012122
 LCMSMS01

Lab ID: XA25009-001 DF=20

Page 101-111 of SDG XA25009

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBS	483257	291005	1000	1.660648	1.61721	1026.86	1	277	74.14	74	Match
PFOA	1360275	1073565	1000	1.267063	0.993422	1275.45	1	277	92.09	92	Match
PFOS	1682669	291005	1000	5.782268	1.079255	5357.65	1	277	386.83	390	Match

YTC-OFFP-70-DW-012122
 LCMSMS02

Lab ID: XA25009-013

Page 308-340 of SDG XA25009

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBS	6489262	228680	1000	28.37704	1.822347	15571.70	1	270	57.67	58	Match
PFHpA	8951182	1011741	1000	8.847306	1.061595	8333.97	1	270	30.87	31	Match
PFNA	841715	1011741	1000	0.831947	1.1873	700.71	1	270	2.60	2.6	Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS Surrogate Recoveries

SDG #: XA25009 Date: 2/2/2022
 Lab: Pace (Shealy) Page: 6
 Project: Yakima Training Center Off-post PFAS Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-65-DW-012122 Lab ID: XA25009-001 DF=20
 Surrogate 13C6 PFDA Page 101-111 of SDG XA25009
 REPORTED Surr %R 84

Found concentration 3.0187
 True Value 3.610 (1000 ng/L x (1 ml/277 mls))
 %R 83.6 Match

Surrogate	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Raw Data Value ng/L
13C6 PFDA	39199	1073565	1000	0.036513	0.873316	41.81	1	277	3.0187	3.0187

YTC-OFFP-70-DW-012122 Lab ID: XA25009-013
 Surrogate 13C2 PFHxA Page 308-340 of SDG XA25009
 REPORTED Surr %R 83

Found concentration 3.0649
 True Value 3.704 (1000 ng/L x (1 ml/270 mls))
 %R 82.7 Match

Surrogate	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Raw Data Value ng/L
13C2 PFHxA	979982	1011741	1000	0.96861	1.170507	827.51	1	270	3.0649	3.0649

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Slope)
 Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

**POST VALIDATION CHAIN OF CUSTODY
AND SAMPLE ANALYSIS DATA SHEETS**

PACE ANALYTICAL SERVICES, LLC



Samples Receipt Checklist (SRC) (MED018C-15)

Issuing Authority: Pace ENV - WCOL

Revised: 9/29/2020

Page 1 of 1

Sample Receipt Checklist (SRC)

Client: ARCADIS

Cooler Inspected by/date: JRG2 / 01/25/2022

Lot #: XA25009

Means of receipt: <input type="checkbox"/> Pace <input type="checkbox"/> Client <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Other:		
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1.	Were custody seals present on the cooler?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	<input type="checkbox"/> 2.	If custody seals were present, were they intact and unbroken?
pH Strip ID: NA	Chlorine Strip ID: NA	Tested by: NA
Original temperature upon receipt / Derived (Corrected) temperature upon receipt	%Solid Snap	Cup ID: 21-2661
4.4 / 4.4 °C NA / NA °C NA / NA °C NA / NA °C		
Method: <input checked="" type="checkbox"/> Temperature Blank <input type="checkbox"/> Against Bottles	IR Gun ID: 5	IR Gun Correction Factor: 0 °C
Method of coolant: <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Ice Packs <input type="checkbox"/> Dry Ice <input type="checkbox"/> None		
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	<input type="checkbox"/> 3.	If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	<input type="checkbox"/> 4.	Is the commercial courier's packing slip attached to this form?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 5.	Were proper custody procedures (relinquished/received) followed?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 6.	Were sample IDs listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 7.	Were sample IDs listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 8.	Was collection date & time listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 9.	Was collection date & time listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 10.	Did all container label information (ID, date, time) agree with the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 11.	Were tests to be performed listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 12.	Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 13.	Was adequate sample volume available?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> 14.	Were all samples received within 1/2 the holding time or 48 hours, whichever comes first?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> 15.	Were any samples containers missing/excess (circle one) samples Not listed on COC?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	<input type="checkbox"/> 16.	For VOA and RSK-175 samples, were bubbles present >"pca-size" (1/2" or 6mm in diameter) in any of the VOA vials?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	<input type="checkbox"/> 17.	Were all DRO/metals/nutrient samples received at a pH of < 2?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	<input type="checkbox"/> 18.	Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	<input type="checkbox"/> 19.	Were all applicable NH ₃ /TKN/cyanide/pheno/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	<input type="checkbox"/> 20.	Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> 21.	Was the quote number listed on the container label? If yes, Quote #
Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)		
Sample(s) NA	were received incorrectly preserved and were adjusted accordingly	
in sample receiving with NA	mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA	
Time of preservation NA	. If more than one preservative is needed, please note in the comments below.	
Sample(s) NA	were received with bubbles >6 mm in diameter.	
Samples(s) NA	were received with TRC > 0.5 mg/L (If #19 is no) and were adjusted accordingly in sample receiving with sodium thiosulfate (Na ₂ S ₂ O ₃) with Shealy ID: NA	
SR barcode labels applied by: JRG2	Date: 01/25/2022	
Comments:		

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-001**

Description: **YTC-OFFP-65-DW-012122**

Matrix: **Aqueous**

Date Sampled: **01/21/2022 1408**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/28/2022 1338	MMM	01/27/2022 1240	29790
2	537.1	537.1	20	01/29/2022 1612	MMM	01/27/2022 1240	29790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	74	D	36	18	7.2	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	580	D	36	18	7.2	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	43	D	1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	140	D	36	18	7.2	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	5.7	D	1.8	0.90	0.72	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	92	D	36	18	7.2	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	390	D	36	18	7.2	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		96	70-130		102	70-130
13C3-HFPO-DA		100	70-130		106	70-130
13C6_PFDA		93	70-130		84	70-130
d5-EtFOSAA		73	70-130		72	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-002**

Description: **YTC-FRB-01-012022**

Matrix: **Aqueous**

Date Sampled: **01/20/2022 1034**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	537.1	537.1	1	01/28/2022 1349	MMM	01/27/2022 1240	29790				

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		85	70-130
13C3-HFPO-DA		90	70-130
13C6_PFDA		92	70-130
d5-EtFOSAA		105	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-003**

Description: **YTC-OFFP-29-DW-012222**

Matrix: **Aqueous**

Date Sampled: **01/21/2022 0918**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/28/2022 1420	MMM	01/27/2022 1240	29790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	5.3		1.8	0.90	0.37	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	28		1.8	0.90	0.37	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.74	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	J	1.8	0.90	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	6.2		1.8	0.90	0.37	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.74	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.6	J	1.8	0.90	0.37	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.74	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	15		1.8	0.90	0.37	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		95	70-130
13C3-HFPO-DA		100	70-130
13C6_PFDA		94	70-130
d5-EtFOSAA		93	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-004**

Description: **YTC-OFFP-25-DW-012222**

Matrix: **Aqueous**

Date Sampled: **01/22/2022 1001**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/28/2022 1431	MMM	01/27/2022 1240	29790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	9.0		2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	55		2.0	1.0	0.40	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	2.0		2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	11		2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	2.5		2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	26		2.0	1.0	0.40	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		97	70-130
13C3-HFPO-DA		98	70-130
13C6_PFDA		95	70-130
d5-EtFOSAA		97	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-005**

Description: **YTC-OFFP-64-DW-012122**

Matrix: **Aqueous**

Date Sampled: **01/21/2022 1358**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/28/2022 1442	MMM	01/27/2022 1240	29790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	3.6		1.8	0.90	0.36	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	10		1.8	0.90	0.36	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.71	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.91	J	1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	2.4		1.8	0.90	0.36	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.71	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.71	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		95	70-130
13C3-HFPO-DA		104	70-130
13C6_PFDA		99	70-130
d5-EtFOSAA		97	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-006**

Description: **YTC-OFFP-61-DW-012122**

Matrix: **Aqueous**

Date Sampled: **01/21/2022 1555**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/28/2022 1452	MMM	01/27/2022 1240	29790
2	537.1	537.1	5	01/29/2022 1623	MMM	01/27/2022 1240	29790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	8.0	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	21		2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	140	D	10	5.0	2.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	11		2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	32		2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.4	J	2.0	1.0	0.80	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	17		2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	86	D	10	5.0	2.0	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		94	70-130		95	70-130
13C3-HFPO-DA		95	70-130		102	70-130
13C6_PFDA		98	70-130		100	70-130
d5-EtFOSAA		103	70-130		110	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-007**

Description: **YTC-OFFP-44-DW-012022**

Matrix: **Aqueous**

Date Sampled: **01/20/2022 0955**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/28/2022 1503	MMM	01/27/2022 1240	29790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	8.0	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		87	70-130
13C3-HFPO-DA		98	70-130
13C6_PFDA		91	70-130
d5-EtFOSAA		100	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-008**

Description: **YTC-OFFP-56-DW-012122**

Matrix: **Aqueous**

Date Sampled: **01/21/2022 1034**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/28/2022 1514	MMM	01/27/2022 1240	29790
2	537.1	537.1	10	01/29/2022 1633	MMM	01/27/2022 1240	29790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	1.1	U	2.2	1.1	0.56	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	1.1	U	2.2	1.1	0.56	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.5	U	9.0	4.5	2.2	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.2	1.1	0.56	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.2	1.1	0.45	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.2	1.1	0.56	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	73		2.2	1.1	0.45	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	510	D	22	11	4.5	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.2	1.1	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.2	1.1	0.45	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	41		2.2	1.1	0.45	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	150	D	22	11	4.5	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	2.6		2.2	1.1	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	61		2.2	1.1	0.45	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.2	1.1	0.45	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.2	1.1	0.56	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.2	1.1	0.90	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	410	D	22	11	4.5	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		89	70-130		96	70-130
13C3-HFPO-DA		105	70-130		108	70-130
13C6_PFDA		77	70-130		87	70-130
d5-EtFOSAA		72	70-130		83	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-009**

Description: **YTC-OFFP-71-DW-012122**

Matrix: **Aqueous**

Date Sampled: **01/21/2022 1328**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	537.1	537.1	1	01/28/2022 1524	MMM	01/27/2022 1240	29790				

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.2	4.1	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	8.4		2.1	1.1	0.41	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	23		2.1	1.1	0.41	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.1	1.1	0.82	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	3.4		2.1	1.1	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	11		2.1	1.1	0.41	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	U	2.1	1.1	0.82	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	5.7		2.1	1.1	0.41	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.1	1.1	0.82	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	12		2.1	1.1	0.41	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		86	70-130
13C3-HFPO-DA		94	70-130
13C6_PFDA		90	70-130
d5-EtFOSAA		88	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-010**

Description: **YTC-OFFP-74-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 0944**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/28/2022 1535	MMM	01/27/2022 1240	29790
2	537.1	537.1	5	01/29/2022 1644	MMM	01/27/2022 1240	29790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	36		1.8	0.90	0.36	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	270	D	9.1	4.6	1.8	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.73	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	13		1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	44		1.8	0.90	0.36	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	2.2		1.8	0.90	0.73	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	22		1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.73	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	200	D	9.1	4.6	1.8	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		88	70-130		94	70-130
13C3-HFPO-DA		109	70-130		101	70-130
13C6_PFDA		95	70-130		101	70-130
d5-EtFOSAA		129	70-130		113	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-011**

Description: **YTC-FRB-02-012122**

Matrix: **Aqueous**

Date Sampled: **01/21/2022 1450**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/28/2022 1556	MMM	01/27/2022 1240	29790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	U	2.2	1.1	0.55	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	U	2.2	1.1	0.55	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.4	U	8.8	4.4	2.2	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.2	1.1	0.55	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.2	1.1	0.55	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.2	1.1	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	U	2.2	1.1	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.2	1.1	0.55	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.2	1.1	0.88	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.1	U	2.2	1.1	0.44	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		75	70-130
13C3-HFPO-DA		79	70-130
13C6_PFDA		86	70-130
d5-EtFOSAA		85	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-012**

Description: **YTC-OFFP-73-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 0845**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 1802	JJG	01/29/2022 1120	30093
2	537.1	537.1	20	01/31/2022 1448	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.8	3.9	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	71	D	39	20	7.8	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	530	D	39	20	7.8	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.78	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	27		2.0	1.0	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	110	D	39	20	7.8	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	5.7		2.0	1.0	0.78	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	63		2.0	1.0	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.78	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	410	D	39	20	7.8	ng/L	2

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		83	70-130		95	70-130
13C3-HFPO-DA		84	70-130		78	70-130
13C6_PFDA		96	70-130		83	70-130
d5-EtFOSAA		92	70-130		91	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-013**

Description: **YTC-OFFP-70-DW-012122**

Matrix: **Aqueous**

Date Sampled: **01/21/2022 1140**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 1813	JJG	01/29/2022 1120	30093
2	537.1	537.1	10	01/31/2022 1426	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.4	3.7	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	58		1.9	0.95	0.37	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	410	D	19	9.5	3.7	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.74	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	31		1.9	0.95	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	130	D	19	9.5	3.7	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	2.6		1.9	0.95	0.74	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	60		1.9	0.95	0.37	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.74	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	330	D	19	9.5	3.7	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		83	70-130		99	70-130
13C3-HFPO-DA		78	70-130		87	70-130
13C6_PFDA		87	70-130		92	70-130
d5-EtFOSAA		92	70-130		99	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-014**

Description: **YTC-OFFP-66-DW-012122**

Matrix: **Aqueous**

Date Sampled: **01/21/2022 1314**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 1824	JJG	01/29/2022 1120	30093
2	537.1	537.1	50	01/31/2022 1532	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.6	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	110	D	95	48	19	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	960	D	95	48	19	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	44		1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	200	D	95	48	19	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	8.1		1.9	0.95	0.76	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	120	D	95	48	19	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	800	D	95	48	19	ng/L	2

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		86	70-130		110	70-130
13C3-HFPO-DA		86	70-130		96	70-130
13C6_PFDA		88	70-130		92	70-130
d5-EtFOSAA		94	70-130		89	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25009-015
Description: YTC-OFFP-62-DW-012122	Matrix: Aqueous
Date Sampled: 01/21/2022 1522	
Date Received: 01/25/2022	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 1835	JJG	01/29/2022 1120	30093
2	537.1	537.1	50	01/31/2022 1543	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.2	U	8.3	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	120	D	100	50	21	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1000	D	100	50	21	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.1	1.1	0.83	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	47		2.1	1.1	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	210	D	100	50	21	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	8.2		2.1	1.1	0.83	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	130	D	100	50	21	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.1	1.1	0.83	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	740	D	100	50	21	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		83	70-130		111	70-130
13C3-HFPO-DA		83	70-130		97	70-130
13C6_PFDA		91	70-130		99	70-130
d5-EtFOSAA		84	70-130		96	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-016**

Description: **YTC-OFFP-55-DW-012122**

Matrix: **Aqueous**

Date Sampled: **01/21/2022 1009**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 1846	JJG	01/29/2022 1120	30093
2	537.1	537.1	20	01/31/2022 1459	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	75	D	36	18	7.3	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	570	D	36	18	7.3	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.73	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	41		1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	170	D	36	18	7.3	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	3.2		1.8	0.90	0.73	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	72		1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.73	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	510	D	36	18	7.3	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		83	70-130		91	70-130
13C3-HFPO-DA		80	70-130		84	70-130
13C6_PFDA		89	70-130		88	70-130
d5-EtFOSAA		91	70-130		89	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-017**

Description: **YTC-FRB-03-012222**

Matrix: **Aqueous**

Date Sampled: **01/22/2022 0930**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 1857	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.2	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.82	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.82	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.82	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		85	70-130
13C3-HFPO-DA		79	70-130
13C6_PFDA		80	70-130
d5-EtFOSAA		93	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-018**

Description: **YTC-OFFP-60-DW-012122**

Matrix: **Aqueous**

Date Sampled: **01/21/2022 1440**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 1908	JJG	01/29/2022 1120	30093
2	537.1	537.1	20	01/31/2022 1510	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.8	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	55		1.9	0.95	0.39	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	430	D	39	20	7.8	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.78	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	34		1.9	0.95	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	110	D	39	20	7.8	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	3.5	S J-	1.9	0.95	0.78	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	76	S	1.9	0.95	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U UJ	1.9	0.95	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.78	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	320	D	39	20	7.8	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		88	70-130		86	70-130
13C3-HFPO-DA		84	70-130		79	70-130
13C6_PFDA		86	70-130		78	70-130
d5-EtFOSAA		82	70-130		77	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25009-019
Description: YTC-OFFP-63-DW-012122	Matrix: Aqueous
Date Sampled: 01/21/2022 1404	
Date Received: 01/25/2022	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 1941	JJG	01/29/2022 1120	30093
2	537.1	537.1	20	01/31/2022 1521	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	65		2.0	1.0	0.39	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	460	D	39	20	7.9	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	26		2.0	1.0	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	120	D	39	20	7.9	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	5.5		2.0	1.0	0.79	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	60		2.0	1.0	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	330	D	39	20	7.9	ng/L	2

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		88	70-130		101	70-130
13C3-HFPO-DA		85	70-130		91	70-130
13C6_PFDA		92	70-130		92	70-130
d5-EtFOSAA		86	70-130		98	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
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 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25009-020**

Description: **YTC-OFFP-67-DW-012122**

Matrix: **Aqueous**

Date Sampled: **01/21/2022 1109**

Date Received: **01/25/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 1952	JJG	01/29/2022 1120	30093
2	537.1	537.1	10	01/31/2022 1437	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	28		2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	180	D	20	10	4.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	17		2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	56		2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	J	2.0	1.0	0.81	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	29		2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	140	D	20	10	4.0	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		82	70-130		93	70-130
13C3-HFPO-DA		75	70-130		80	70-130
13C6_PFDA		77	70-130		78	70-130
d5-EtFOSAA		80	70-130		82	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
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Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #XA25017

Analyses Performed By:

Pace South Carolina

formerly Shealy Environmental Services

West Columbia, South Carolina

Report #44477R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # XA25017 for samples collected in association with the Yakima Training Center Site. The review was conducted as a Stage 3/4 evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-FD-01-DW-011922	XA25017-001	Potable water	1/19/2022	YTC-OFFP-39-DW-011922	X
YTC-OFFP-26-DW-011822	XA25017-002	Potable water	1/18/2022		X
YTC-OFFP-35-DW-011922	XA25017-003	Potable water	1/19/2022		X
YTC-OFFP-36-DW-011922	XA25017-004	Potable water	1/19/2022		X
YTC-OFFP-30-DW-011922	XA25017-005	Potable water	1/19/2022		X
YTC-OFFP-41-DW-011922	XA25017-006	Potable water	1/19/2022		X
YTC-OFFP-24-DW-011822	XA25017-007	Potable water	1/18/2022		X
YTC-OFFP-27-DW-011822	XA25017-008	Potable water	1/18/2022		X
YTC-OFFP-34-DW-011922	XA25017-009	Potable water	1/19/2022		X
YTC-OFFP-28-DW-011822	XA25017-010	Potable water	1/18/2022		X
YTC-OFFP-38-DW-011922	XA25017-011	Potable water	1/19/2022		X
YTC-OFFP-39-DW-011922	XA25017-012	Potable water	1/19/2022		X
YTC-OFFP-32-DW-011922	XA25017-013	Potable water	1/19/2022		X
YTC-OFFP-42-DW-011922	XA25017-014	Potable water	1/19/2022		X
YTC-OFFP-31-DW-011922	XA25017-015	Potable water	1/19/2022		X
YTC-OFFP-37-DW-011922	XA25017-016	Potable water	1/19/2022		X
YTC-OFFP-33-DW-011922	XA25017-017	Potable water	1/19/2022		X
YTC-OFFP-40-DW-011922	XA25017-018	Potable water	1/19/2022		X
YTC-OFFP-48-DW-012022	XA25017-019	Potable water	1/20/2022		X
YTC-OFFP-49-DW-012022	XA25017-020	Potable water	1/20/2022		X
YTC-OFFP-57-DW-012022	XA25017-021	Potable water	1/20/2022		X
YTC-FD-02-DW-012022	XA25017-022	Potable water	1/20/2022	YTC-OFFP-54-DW-012022	X
YTC-OFFP-53-DW-012022	XA25017-023	Potable water	1/20/2022		X
YTC-OFFP-54-DW-012022	XA25017-024	Potable water	1/20/2022		X
YTC-OFFP-47-DW-012022	XA25017-025	Potable water	1/20/2022		X
YTC-OFFP-52-DW-012022	XA25017-026	Potable water	1/20/2022		X

DATA REVIEW REPORT

Note:

1. Stage 4 validation was performed on sample locations YTC-OFFP-30-DW-011922, YTC-OFFP-32-DW-011922, and YTC-OFFP-52-DW-012022.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample locations YTC-OFFP-39-DW-011922 and YTC-OFFP-54-DW-012022.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 1.1 for drinking water. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00216-06 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/ MS, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC PFAS, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Washington, August 2021, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance

DATA REVIEW REPORT

or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 1.1	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were initially analyzed within the specified holding time criteria.

The analyses that exceeded the holding time are presented in the following table.

Sample Locations	Holding Time	Criteria
YTC-OFFP-27-DW-011822 RE	Extraction Completed 15 days from collection	< 14 days

Sample results associated with sample locations analyzed by analytical method USEPA method 537 version 1.1 were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed past holding time	J	UJ

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

DATA REVIEW REPORT

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.1 Table B-15.

The ion transitions were as specified in DoD QSM 5.1.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 1.1 must be within 70% to 130% of the true value.

Sample locations associated with surrogate exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Surrogate	%R	RE %R
YTC-OFFP-27-DW-011822	13C2 PFHxA	AC	AC
	13C3 HFPO-DA	AC	AC
	13C6 PFDA	< 70% but > 10%	AC
	d5-EtFOSAA	< 70% but > 10%	AC
YTC-OFFP-39-DW-011922	13C2 PFHxA	AC	MS Analysis AC
	13C3 HFPO-DA	< 70% but > 10%	< 70% but > 10%
	13C6 PFDA	AC	AC
	d5-EtFOSAA	AC	AC
YTC-OFFP-32-DW-011922	13C2 PFHxA	< 70% but > 10%	--
	13C3 HFPO-DA	< 70% but > 10%	--

DATA REVIEW REPORT

Sample Locations	Surrogate	%R	RE %R
	13C6 PFDA	AC	--
	d5-EtFOSAA	AC	--

Note:

AC Acceptable

Where a re-extracted analysis was performed, results are reported from the analysis in bold above.

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 130%	Non-detect	No Action
	Detect	J+
< 70% but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	R
	Detect	J

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

Sample locations associated with internal standards exhibiting responses outside of the control limits are presented in the following table.

Sample Locations	Internal Standard	Response
YTC-OFFP-32-DW-011922 (primary analysis)	d3-MeFOSAA	+151.5% (ICAL)

The criteria used to evaluate the IS areas are presented in the following table. In the case of an IS deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
Area response < 70% of the most recent CCV and/or less than 50% of the average area calculated from the ICAL	Non-detect	UJ
	Detect	J
Area response > 140% of the most recent CCV or > 150% average area calculated from the ICAL	Non-detect	No Action
	Detect	J

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified

DATA REVIEW REPORT

acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis performed on sample location YTC-OFFP-54-DW-012022 exhibited recoveries and RPD between recoveries within the control limits.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
YTC-OFFP-39-DW-011922	GenX	< 70% but >10%	AC
	Perfluorohexanesulfonic acid	SR>4X	SR>4X

Note:

AC Acceptable

SR>4X Sample result is greater than 4 times the added spike

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 130%	Non-detect	No Action
	Detect	J+
< 70% but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	X or R
	Detect	J-
SR>4X: Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 35% for water matrices and 50% for soils is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied for water matrices and three times the LOQ for soil matrices.

DATA REVIEW REPORT

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
YTC-OFFP-39-DW-011922/ YTC-FD-01-DW-011922	Perfluorobutanesulfonic acid	5.8	5.9	AC
	Perfluorohexanesulfonic acid	36	36	0.0%
	Perfluoroheptanoic acid	3.3	3.5	AC
	Perfluorohexanoic acid	11	12	8.7%
	Perfluorooctanoic acid	3.8	3.7	AC
	Perfluorooctanesulfonic acid	31	32	3.2%
YTC-OFFP-54-DW-012022/ YTC-FD-02-DW-012022	Perfluorohexanesulfonic acid	1.6 J	1.6 J	AC

Notes:

AC Acceptable

The calculated RPD and results between the parent sample and their associated field duplicate were acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compounds that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-38-DW-011922	Perfluorohexanesulfonic acid	--	150	150 D
	Perfluorooctanesulfonic acid	--	150	150 D
YTC-OFFP-32-DW-011922	Perfluorobutanesulfonic acid	--	120	120 D
	Perfluorohexanesulfonic acid	--	710	710 D
	Perfluorohexanoic acid	--	240	240 D
	Perfluorooctanesulfonic acid	--	770	770 D
YTC-OFFP-42-DW-011922	Perfluorobutanesulfonic acid	--	79	79 D
	Perfluorohexanesulfonic acid	--	540	540 D
	Perfluorohexanoic acid	--	170	170 D
	Perfluorooctanesulfonic acid	--	540	540 D
YTC-OFFP-31-DW-011922	Perfluorohexanesulfonic acid	--	220	220 D
	Perfluorooctanesulfonic acid	--	180	180 D

Note: The laboratory did not report the original analysis; only the diluted result.

DATA REVIEW REPORT

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range.	D

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Extracted Internal Standard %R		X	X		
Injection Internal Standard %R		X	X		
Dilution Factor		X		X	
Moisture Content	X				X
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
D. Ion Ratio %D		X		X	
E. Transcription/calculations acceptable		X		X	
F. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

- %RSD Relative standard deviation
- %R Percent recovery
- RPD Relative percent difference
- %D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Lyndi Mott/Andrew Korycinski, Arcadis

SIGNATURE:



DATE: February 11, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: February 11, 2022

Stage 3 / 4
PFAS Calibration Standards

SDG #: XA25017
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/14/2022
 Page: 1
 Validated by: LWM

Method: EPA 537 1.1

PFBS 1/19/2022 Calibration LCMSMS02 Page 688-836 of SDG XA25017

Cal Conc ng/L	Std Area	IS Area	IS Conc ng/L	Area Ratio	Calculated RF	Avg RF/ Slope	Calc Amount ng/L	%R Calc		Reported %R	
								Tvalue	ng/L		
44.2	18101	222748	1000	0.081262	1.8385121	1.822347	44.59	44.2	100.89	100.9	MATCH
88.4	35899	224895	1000	0.159626	1.8057195	1.822347	87.59	88.4	99.09	99.1	MATCH
176.8	70907	217208	1000	0.326447	1.8464223	1.822347	179.14	176.8	101.32	101.3	MATCH
442	171552	224279	1000	0.764904	1.730553	1.822347	419.74	442	94.96	95	MATCH
884	360571	226821	1000	1.589672	1.7982715	1.822347	872.32	884	98.68	98.7	MATCH
1768	742882	231423	1000	3.210061	1.8156455	1.822347	1761.50	1768	99.63	99.6	MATCH
4420	1811980	226406	1000	8.003233	1.8106862	1.822347	4391.72	4420	99.36	99.4	MATCH
8840	3515849	207235	1000	16.96552	1.9191762	1.822347	9309.71	8840	105.31	105.3	MATCH
13260	5147519	211759	1000	24.30838	1.8332114	1.822347	13339.05	13260	100.60	100.6	MATCH
17680	6713163	208026	1000	32.27079	1.8252708	1.822347	17708.37	17680	100.16	100.2	MATCH
Avg RF						1.8223469	Match				

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Cal Conc ng/L	IS Conc ng/L	Conc Ratio (x)	Std Area	IS Area	Area Ratio (y)
44.2	1000	0.0442	18101	222748	0.0812622
88.4	1000	0.0884	35899	224895	0.1596256
176.8	1000	0.1768	70907	217208	0.3264475
442	1000	0.442	171552	224279	0.7649044
884	1000	0.884	360571	226821	1.589672
1768	1000	1.768	742882	231423	3.2100612
4420	1000	4.42	1811980	226406	8.0032331
8840	1000	8.84	3515849	207235	16.965517
13260	1000	13.26	5147519	211759	24.308384
17680	1000	17.68	6713163	208026	32.270788

	Calculated	Reported	
Slope	1.8379649	1.822347	Match
Correlation	0.9997616	--	
r ²	0.9995233	0.999	Match

Lab calibration software used weighted concentration and forced through origin

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: XA25017
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/14/2022
 Page: 2
 Validated by: LWM

Method: EPA 537 1.1

ICV 500 1/19/2022 15:55 Page 845 of SDG XA25017
 LCMSMS02

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFBS	457.11	442.5	103.30	103.3	MATCH
PFOA	538.2	500	107.64	107.6	MATCH
PFOS	469.92	462.75	101.55	101.5	MATCH
PFHxS	468.81	456	102.81	102.8	MATCH
PFHxA	500.33	500	100.07	100.1	MATCH
PFHpA	526.70	500	105.34	105.3	MATCH

CCV 200 1/30/2022 14:57 Page 862 of SDG XA25017
 LCMSMS02

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFBS	187.18	176.8	105.87	105.9	MATCH
PFOA	211.04	200	105.52	105.5	MATCH
PFOS	178.53	185.6	96.19	96.2	MATCH

CCV 1000 2/2/2022 15:39 Page 962 of SDG XA25017
 LCMSMS02

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFHxS	900.32	910	98.94	98.9	MATCH
PFHxA	895.3	1000	89.53	89.5	MATCH
PFHpA	933.69	1000	93.37	93.4	MATCH

Stage 3 / 4
PFAS LCS

SDG #: XA25017
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/14/2022
 Page: 3
 Validated by: LWM

Method: EPA 537 1.1

LCS XQ30093-002 Page 1273 of SDG XA25017

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFBS	355498	232283	1000	1.530452	1.822347	839.82	250	3.36	3.5	95.98	95	MATCH
PFOA	863900	851602	1000	1.014441	0.983765	1031.18	250	4.12	4.0	103.12	103	MATCH
PFOS	232078	232283	1000	0.999117	1.194126	836.69	250	3.35	4	90.45	90	MATCH

LCS XQ30250-002 Page 1290 of SDG XA25017

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFHxS	256620	251476	1000	1.020455	1.226308	832.14	250	3.33	3.6	92.46	91	MATCH
PFHxA	1014973	1011005	1000	1.003925	1.243824	807.13	250	3.23	4.0	80.71	81	MATCH
PFOS	236817	251476	1000	0.941708	1.194126	788.62	250	3.15	3.7	85.26	85	MATCH

LCS XQ30329-002 Page 1313 of SDG XA25017

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFHpA	5176841	796070	1000	6.502997	1.061595	6125.69	250	24.50	24	102.09	102	MATCH
PFOA	5076170	796070	1000	6.376537	0.983765	6481.77	250	25.93	24	108.03	108	MATCH
PFOS	1372111	209930	1000	6.536041	1.194126	5473.49	250	21.89	22	99.52	98	MATCH

Differences in %R may be due to rounding of true value

Calculated Amount ng/L = ((Area Ratio x IS Conc)/RF)

Calculated ng/L = ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS MS/MSD

SDG #: XA25017
Lab: Pace (Shealy)
Project: Yakima Training Center Off-post PFAS

Date: 2/14/2022
Page: 4
Validated by: LWM

Method: EPA 537 1.1

MS/MSD Sample ID YTC-OFFP-39-DW-011922

Page 1352 and 1390 of SDG XA25017

ANALYTE GenX
REPORTED MS %R 69
REPORTED MSD %R 74
REPORTED RPD 10

$$\%R = \frac{100 * (\text{MS Conc} - \text{Sample Conc})}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * |\text{MS \%R} - \text{MSD \%R}|}{\text{Average of MS MSD \%R}}$$

Sample Concentration 0
MS Concentration 5.2352
MSD Concentration 5.7951
MS TV 7.6
MSD TV 7.9

MS %R 68.88 MATCH
MSD %R 73.36 MATCH
RPD 10.15 MATCH

Differences in %R may be due to rounding of the true value

Stage 3 / 4
PFAS Sample Concentration

SDG #: XA25017
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/14/2022
 Page: 5
 Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-30-DW-011922 Lab ID: XA25017-005 Page 185-202 of SDG XA25017
 LCMSMS02 1/30/2022 20:57

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFBS	558130	212922	1000	2.621289	1.822347	1438.41	1	253	5.69	5.7
PFOA	413793	862596	1000	0.479707	0.983765	487.62	1	253	1.93	1.9 J
PFOS	1043668	212922	1000	4.901645	1.194126	4104.80	1	253	16.22	16

Match
Match
Match

YTC-OFFP-32-DW-011922 Lab ID: XA25017-013 DF=20 Page 389-404 of SDG XA25017
 LCMSMS02 2/2/2022 14:23

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFHxS	2500518	220963	1000	11.31646	1.226308	9228.07	1	260	709.85	710
PFHxA	3372583	869208	1000	3.880064	1.243824	3119.46	1	260	239.96	240
PFOS	2631311	220963	1000	11.90838	1.194126	9972.46	1	260	767.11	770

Match
Match
Match

YTC-OFFP-52-DW-012022 Lab ID: XA25017-026 Page 665-686 of SDG XA25017
 LCMSMS02 2/2/2022 17:28

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFHpA	1784052	922055	1000	1.934865	1.061595	1822.60	1	246	7.41	7.4
PFOA	2455528	922055	1000	2.663104	0.983765	2707.05	1	246	11.00	11
PFOS	3054075	221725	1000	13.77416	1.194126	11534.93	1	246	46.89	47

Match
Match
Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS Surrogate Recoveries

SDG #: XA25017
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/14/2022
 Page: 6
 Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-30-DW-011922
 Surrogate 13C6 PFDA
 REPORTED Surr %R 88

Lab ID: XA25017-005
 Page 185-202 of SDG XA25017

Found concentration 3.4883
 True Value 3.953 (1000 ng/L x (1 ml/253 mls))
 %R 88.3 Match

Surrogate	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Raw Data Value ng/L
13C6 PFDA	812165	862596	1000	0.941536	1.066837	882.55	1	253	3.4883	3.4883

YTC-OFFP-32-DW-011922
 Surrogate 13C2 PFHxA
 REPORTED Surr %R 95

Lab ID: XA25017-013 DF=20
 Page 389-404 of SDG XA25017

Found concentration 3.6489
 True Value 3.846 (1000 ng/L x (1 ml/260 mls))
 %R 94.9 Match

Surrogate	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Raw Data Value ng/L
13C2 PFHxA	48262	869208	1000	0.055524	1.170507	47.44	1	260	3.6489	3.6489

YTC-OFFP-52-DW-012022
 Surrogate 13C3 HFPO-DA
 REPORTED Surr %R 84

Lab ID: XA25017-026
 Page 665-686 of SDG XA25017

Found concentration 17.057
 True Value 20.325 (5000 ng/L x (1 ml/246 mls))
 %R 83.9 Match

Surrogate	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Raw Data Value ng/L
13C3HFPOD	1654560	922055	1000	1.794427	0.427649	4196.03	1	246	17.0570	17.057

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Slope)
 Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

**CHAIN OF CUSTODY AND
SAMPLE ANALYSIS DATA SHEETS**

PACE ANALYTICAL SERVICES, LLC



Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised: 9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Aresdis Cooler Inspected by/Date: JRG2 / 01/25/2022 Lot #: NA25D17

Means of receipt: <input type="checkbox"/> Pace <input type="checkbox"/> Client <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Other:	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1. Were custody seals present on the cooler?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	2. If custody seals were present, were they intact and unbroken?
pH Strip ID: <u>NA</u> Chlorine Strip ID: <u>NA</u> Tested by: <u>NA</u>	
Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: <u>NA</u> <u>5.1 / 5.1</u> °C <u>1.9 / 1.9</u> °C <u>NA / NA</u> °C <u>NA / NA</u> °C	
Method: <input checked="" type="checkbox"/> Temperature Blank <input type="checkbox"/> Against Bottles IR Gun ID: <u>5</u> IR Gun Correction Factor: <u>0</u> °C	
Method of coolant: <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Ice Packs <input type="checkbox"/> Dry Ice <input type="checkbox"/> None	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	4. Is the commercial courier's packing slip attached to this form?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. Were proper custody procedures (relinquished/received) followed?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6. Were sample IDs listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7. Were sample IDs listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. Was collection date & time listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9. Was collection date & time listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. Did all container label information (ID, date, time) agree with the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. Were tests to be performed listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	13. Was adequate sample volume available?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	19. Were all applicable NH ₃ /TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	21. Was the quote number listed on the container label? If yes, Quote # <u>24628</u>
Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)	
Sample(s) <u>NA</u> were received incorrectly preserved and were adjusted accordingly in sample receiving with <u>NA</u> mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # <u>NA</u>	
Time of preservation <u>NA</u> . If more than one preservative is needed, please note in the comments below.	
Sample(s) <u>NA</u> were received with bubbles >6 mm in diameter.	
Samples(s) <u>NA</u> were received with TRC > 0.5 mg/L (If #19 is no) and were adjusted accordingly in sample receiving with sodium thiosulfate (Na ₂ S ₂ O ₃) with Shealy ID: <u>NA</u>	
SR barcode labels applied by: <u>JRG2</u> Date: <u>01/25/2022</u>	

Comments:

PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-001
Description: YTC-FD-01-DW-011922	Matrix: Aqueous
Date Sampled: 01/19/2022	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022	JJG	01/29/2022	1120 30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.6	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	5.9		1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	36		1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	3.5		1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	12		1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	3.7		1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	32		1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		79	70-130
13C3-HFPO-DA		74	70-130
13C6_PFDA		79	70-130
d5-EtFOSAA		88	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-002
Description: YTC-OFFP-26-DW-011822	Matrix: Aqueous
Date Sampled: 01/18/2022 1404	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.2	U	2.3	1.2	0.58	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.2	U	2.3	1.2	0.58	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.7	U	9.3	4.7	2.3	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.2	U	2.3	1.2	0.58	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.2	U	2.3	1.2	0.47	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.2	U	2.3	1.2	0.58	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.2	U	2.3	1.2	0.47	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	2.0	J	2.3	1.2	0.47	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.2	U	2.3	1.2	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.2	U	2.3	1.2	0.47	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.2	U	2.3	1.2	0.47	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.2	U	2.3	1.2	0.47	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.2	U	2.3	1.2	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.2	U	2.3	1.2	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.2	U	2.3	1.2	0.47	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.2	U	2.3	1.2	0.58	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.2	U	2.3	1.2	0.93	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.7	J	2.3	1.2	0.47	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		85	70-130
13C3-HFPO-DA		79	70-130
13C6_PFDA		81	70-130
d5-EtFOSAA		82	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-003
Description: YTC-OFFP-35-DW-011922	Matrix: Aqueous
Date Sampled: 01/19/2022 1504	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 2035	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		90	70-130
13C3-HFPO-DA		83	70-130
13C6_PFDA		81	70-130
d5-EtFOSAA		92	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-004
Description: YTC-OFFP-36-DW-011922	Matrix: Aqueous
Date Sampled: 01/19/2022 1438	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 2046	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.2	U	8.3	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.1	1.1	0.83	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	U	2.1	1.1	0.83	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.1	1.1	0.83	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.1	U	2.1	1.1	0.41	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		85	70-130
13C3-HFPO-DA		80	70-130
13C6_PFDA		78	70-130
d5-EtFOSAA		92	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-005
Description: YTC-OFFP-30-DW-011922	Matrix: Aqueous
Date Sampled: 01/19/2022 1625	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 2057	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	5.7		2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	36		2.0	1.0	0.40	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.8	J	2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	7.6		2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.9	J	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	16		2.0	1.0	0.40	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		103	70-130
13C3-HFPO-DA		93	70-130
13C6_PFDA		88	70-130
d5-EtFOSAA		92	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-006
Description: YTC-OFFP-41-DW-011922	Matrix: Aqueous
Date Sampled: 01/19/2022 1714	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 2108	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	3.1		1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	18		1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	2.1		1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	6.4		1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	3.9		1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	12		1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		83	70-130
13C3-HFPO-DA		77	70-130
13C6_PFDA		83	70-130
d5-EtFOSAA		85	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-007
Description: YTC-OFFP-24-DW-011822	Matrix: Aqueous
Date Sampled: 01/18/2022 1634	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 2119	JJG	01/29/2022 1120	30093

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	6.5		2.0	1.0	0.39	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	38		2.0	1.0	0.39	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.3	J	2.0	1.0	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	8.3		2.0	1.0	0.39	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	2.1		2.0	1.0	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	20		2.0	1.0	0.39	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		91	70-130
13C3-HFPO-DA		84	70-130
13C6_PFDA		82	70-130
d5-EtFOSAA		82	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-008
Description: YTC-OFFP-27-DW-011822	Matrix: Aqueous
Date Sampled: 01/18/2022 1500	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 2130	JJG	01/29/2022 1120	30093
2	537.1	537.1	1	02/03/2022 1716	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.95	UQ	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.95	UQ	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	UQ	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	UQ	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	UQ	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	UQ	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	8.0	Q	1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	42	Q	1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	UQ	1.9	0.95	0.75	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	UQ	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.6	JQ	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	9.2	Q	1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	UQ	1.9	0.95	0.75	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	2.5	Q	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	UQ	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	UQ	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	UQ	1.9	0.95	0.75	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	22	Q	1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		82	70-130	H	105	70-130
13C3-HFPO-DA		75	70-130	H	95	70-130
13C6_PFDA	N	65	70-130	H	102	70-130
d5-EtFOSAA	N	66	70-130	H	107	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-008
Description: YTC-OFFP-27-DW-011822	Matrix: Aqueous
Date Sampled: 01/18/2022 1500	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	01/30/2022 2130	JJG	01/29/2022 1120	30093
2	537.1	537.1	1	02/03/2022 1716	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.95	UH	1.9	0.95	0.49	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.95	UH	1.9	0.95	0.49	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	UH	7.8	3.9	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	UH	1.9	0.95	0.49	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	UH	1.9	0.95	0.39	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	UH	1.9	0.95	0.49	ng/L	2
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	9.0	H	1.9	0.95	0.39	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	52	H	1.9	0.95	0.39	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	UH	1.9	0.95	0.78	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	UH	1.9	0.95	0.39	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.9	H	1.9	0.95	0.39	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	11	H	1.9	0.95	0.39	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	UH	1.9	0.95	0.78	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	2.7	H	1.9	0.95	0.39	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	UH	1.9	0.95	0.39	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	UH	1.9	0.95	0.49	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	UH	1.9	0.95	0.78	ng/L	2
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	28	H	1.9	0.95	0.39	ng/L	2

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		82	70-130	H	105	70-130
13C3-HFPO-DA		75	70-130	H	95	70-130
13C6_PFDA	N	65	70-130	H	102	70-130
d5-EtFOSAA	N	66	70-130	H	107	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-009
Description: YTC-OFFP-34-DW-011922	Matrix: Aqueous
Date Sampled: 01/19/2022 1349	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/01/2022 1408	JJG	01/31/2022 1630	30250

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.2	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	2.5		2.0	1.0	0.41	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.82	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.82	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.82	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		81	70-130
13C3-HFPO-DA		72	70-130
13C6_PFDA		85	70-130
d5-EtFOSAA		91	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-010
Description: YTC-OFFP-28-DW-011822	Matrix: Aqueous
Date Sampled: 01/18/2022 1605	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	537.1	537.1	1	02/02/2022 1401	JJG	01/31/2022 1630	30250

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.46	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.46	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.4	3.7	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.46	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.37	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.46	ng/L	2
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	2.1		1.9	0.95	0.37	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	8.4		1.9	0.95	0.37	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.74	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.37	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.37	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.4	J	1.9	0.95	0.37	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.74	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.37	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.37	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.46	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.74	ng/L	2
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	4.1		1.9	0.95	0.37	ng/L	2

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C2_PFHxA		75	70-130
13C3-HFPO-DA		71	70-130
13C6_PFDA		79	70-130
d5-EtFOSAA		96	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-011
Description: YTC-OFFP-38-DW-011922	Matrix: Aqueous
Date Sampled: 01/19/2022 1447	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/01/2022 1429	JJG	01/31/2022 1630	30250
2	537.1	537.1	10	02/02/2022 1412	JJG	01/31/2022 1630	30250

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	21		2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	150	D	20	10	4.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	13		2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	43		2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	16		2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	150	D	20	10	4.0	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		77	70-130		97	70-130
13C3-HFPO-DA		73	70-130		86	70-130
13C6_PFDA		80	70-130		94	70-130
d5-EtFOSAA		91	70-130		113	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA25017-012**

Description: **YTC-OFFP-39-DW-011922**

Matrix: **Aqueous**

Date Sampled: **01/19/2022 1541**

Project Name: **Yakima PFAS PA SI**

Date Received: **01/25/2022**

Project Number: **30059933.YTC00**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	537.1	537.1	1	02/01/2022 1440	JJG	01/31/2022 1630	30250				
Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run		
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	UQ	2.1	1.1	0.52	ng/L	1		
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	UQ	2.1	1.1	0.52	ng/L	1		
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.2	UQS	8.3	4.2	2.1	ng/L	1		
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	UQ	2.1	1.1	0.52	ng/L	1		
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	UQ	2.1	1.1	0.41	ng/L	1		
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	UQ	2.1	1.1	0.52	ng/L	1		
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	5.8	Q	J-	2.1	1.1	0.41	ng/L	1	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	36	QS	J-	2.1	1.1	0.41	ng/L	1	
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	UQ	2.1	1.1	0.83	ng/L	1		
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	UQ	2.1	1.1	0.41	ng/L	1		
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	3.3	Q	J-	2.1	1.1	0.41	ng/L	1	
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	11	Q	J-	2.1	1.1	0.41	ng/L	1	
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	UQ	2.1	1.1	0.83	ng/L	1		
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	3.8	Q	J-	2.1	1.1	0.41	ng/L	1	
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	UQ	2.1	1.1	0.41	ng/L	1		
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	UQ	2.1	1.1	0.52	ng/L	1		
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	UQ	2.1	1.1	0.83	ng/L	1		
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	31	Q	J-	2.1	1.1	0.41	ng/L	1	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		75	70-130
13C3-HFPO-DA	N	67	70-130
13C6_PFDA		79	70-130
d5-EtFOSAA		90	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-013
Description: YTC-OFFP-32-DW-011922	Matrix: Aqueous
Date Sampled: 01/19/2022 0930	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/01/2022 1513	JJG	01/31/2022 1630	30250
2	537.1	537.1	20	02/02/2022 1423	JJG	01/31/2022 1630	30250

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	UQ	1.9	0.95	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	UQ	1.9	0.95	0.48	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	UQ	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	UQ	1.9	0.95	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	UQ	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	UQ	1.9	0.95	0.48	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	120	D	38	19	7.7	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	710	D	38	19	7.7	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	UQ	1.9	0.95	0.77	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	UQ	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	46	J-	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	240	D	38	19	7.7	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.9	J-	1.9	0.95	0.77	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	66	J-	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	UQ	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	UQ	1.9	0.95	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	UQ	1.9	0.95	0.77	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	770	D	38	19	7.7	ng/L	2

Surrogate	Q	Run 1		Run 2	
		% Recovery	Acceptance Limits	% Recovery	Acceptance Limits
13C2_PFHxA	N	66	70-130	95	70-130
13C3-HFPO-DA	N	69	70-130	85	70-130
13C6_PFDA		79	70-130	101	70-130
d5-EtFOSAA		92	70-130	118	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-014
Description: YTC-OFFP-42-DW-011922	Matrix: Aqueous
Date Sampled: 01/19/2022 1215	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/01/2022 1524	JJG	01/31/2022 1630	30250
2	537.1	537.1	20	02/02/2022 1433	JJG	01/31/2022 1630	30250

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	79	D	37	19	7.5	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	540	D	37	19	7.5	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	36		1.9	0.95	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	170	D	37	19	7.5	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	2.3		1.9	0.95	0.75	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	62		1.9	0.95	0.37	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	540	D	37	19	7.5	ng/L	2

Surrogate	Run 1			Run 2		
	Q	% Recovery	Acceptance Limits	Q	% Recovery	Acceptance Limits
13C2_PFHxA		72	70-130		97	70-130
13C3-HFPO-DA		71	70-130		90	70-130
13C6_PFDA		80	70-130		97	70-130
d5-EtFOSAA		92	70-130		121	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-015
Description: YTC-OFFP-31-DW-011922	Matrix: Aqueous
Date Sampled: 01/19/2022 1014	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/01/2022 1535	JJG	01/31/2022 1630	30250
2	537.1	537.1	10	02/02/2022 1444	JJG	01/31/2022 1630	30250

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.8	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	28		1.9	0.95	0.39	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	220	D	19	9.5	3.9	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.78	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	16		1.9	0.95	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	54		1.9	0.95	0.39	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.78	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	17		1.9	0.95	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.78	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	180	D	19	9.5	3.9	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		83	70-130		106	70-130
13C3-HFPO-DA		79	70-130		93	70-130
13C6_PFDA		88	70-130		98	70-130
d5-EtFOSAA		106	70-130		114	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-016
Description: YTC-OFFP-37-DW-011922	Matrix: Aqueous
Date Sampled: 01/19/2022 1401	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/01/2022 1546	JJG	01/31/2022 1630	30250

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.3	J	2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	6.8		2.0	1.0	0.40	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	3.0		2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.8	J	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	2.9		2.0	1.0	0.40	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		100	70-130
13C3-HFPO-DA		88	70-130
13C6_PFDA		103	70-130
d5-EtFOSAA		114	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-017
Description: YTC-OFFP-33-DW-011922	Matrix: Aqueous
Date Sampled: 01/19/2022 1250	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1517	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		97	70-130
13C3-HFPO-DA		91	70-130
13C6_PFDA		94	70-130
d5-EtFOSAA		108	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-018
Description: YTC-OFFP-40-DW-011922	Matrix: Aqueous
Date Sampled: 01/19/2022 1621	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1528	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.35	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	4.6		1.8	0.90	0.35	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	27		1.8	0.90	0.35	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.71	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.35	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	2.3		1.8	0.90	0.35	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	7.6		1.8	0.90	0.35	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.71	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	2.7		1.8	0.90	0.35	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.35	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.71	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	20		1.8	0.90	0.35	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		97	70-130
13C3-HFPO-DA		94	70-130
13C6_PFDA		95	70-130
d5-EtFOSAA		94	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-019
Description: YTC-OFFP-48-DW-012022	Matrix: Aqueous
Date Sampled: 01/20/2022 1045	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1550	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.6	J	1.8	0.90	0.36	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	4.9		1.8	0.90	0.36	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		89	70-130
13C3-HFPO-DA		90	70-130
13C6_PFDA		93	70-130
d5-EtFOSAA		105	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-020
Description: YTC-OFFP-49-DW-012022	Matrix: Aqueous
Date Sampled: 01/20/2022 0958	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1601	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	2.4		1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	8.3		1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.2	J	1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		91	70-130
13C3-HFPO-DA		86	70-130
13C6_PFDA		94	70-130
d5-EtFOSAA		99	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-021
Description: YTC-OFFP-57-DW-012022	Matrix: Aqueous
Date Sampled: 01/20/2022 1304	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1612	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	2.0		1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	7.5		1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	2.5		1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.7	J	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	2.5		1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		94	70-130
13C3-HFPO-DA		90	70-130
13C6_PFDA		86	70-130
d5-EtFOSAA		93	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-022
Description: YTC-FD-02-DW-012022	Matrix: Aqueous
Date Sampled: 01/20/2022	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1623	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.2	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.6	J	2.0	1.0	0.41	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.82	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.82	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.82	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		94	70-130
13C3-HFPO-DA		90	70-130
13C6_PFDA		87	70-130
d5-EtFOSAA		92	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-023
Description: YTC-OFFP-53-DW-012022	Matrix: Aqueous
Date Sampled: 01/20/2022 1315	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1634	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.3	J	1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	5.0		1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.5	J	1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.96	J	1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		94	70-130
13C3-HFPO-DA		91	70-130
13C6_PFDA		90	70-130
d5-EtFOSAA		83	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-024
Description: YTC-OFFP-54-DW-012022	Matrix: Aqueous
Date Sampled: 01/20/2022 1247	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1645	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.8	3.9	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.6	J	2.0	1.0	0.39	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.78	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.78	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.78	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.0	U	2.0	1.0	0.39	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		93	70-130
13C3-HFPO-DA		85	70-130
13C6_PFDA		80	70-130
d5-EtFOSAA		89	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-025
Description: YTC-OFFP-47-DW-012022	Matrix: Aqueous
Date Sampled: 01/20/2022 1110	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1718	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.8	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.78	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.78	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.78	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.95	U	1.9	0.95	0.39	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		88	70-130
13C3-HFPO-DA		83	70-130
13C6_PFDA		85	70-130
d5-EtFOSAA		86	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA25017-026
Description: YTC-OFFP-52-DW-012022	Matrix: Aqueous
Date Sampled: 01/20/2022 1225	Project Name: Yakima PFAS PA SI
Date Received: 01/25/2022	Project Number: 30059933.YTC00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1728	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	12		2.0	1.0	0.41	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	66		2.0	1.0	0.41	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	7.4		2.0	1.0	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	25		2.0	1.0	0.41	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	11		2.0	1.0	0.41	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	47		2.0	1.0	0.41	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		84	70-130
13C3-HFPO-DA		84	70-130
13C6_PFDA		87	70-130
d5-EtFOSAA		106	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #XA26028

Analyses Performed By:

Pace South Carolina

formerly Shealy Environmental Services

West Columbia, South Carolina

Report #44525R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # XA26028 for samples collected in association with the Yakima Training Center Site. The review was conducted as a Stage 3/4 evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-59-DW-012122	XA26028-001	Potable water	1/21/2022		X
YTC-OFFP-80-DW-012422	XA26028-002	Potable water	1/24/2022		X
YTC-OFFP-76-DW-012422	XA26028-003	Potable water	1/24/2022		X
YTC-OFFP-86-DW-012422	XA26028-004	Potable water	1/24/2022		X
YTC-OFFP-89-DW-012422	XA26028-005	Potable water	1/24/2022		X
YTC-OFFP-99-DW-012522	XA26028-006	Potable water	1/25/2022		X
YTC-OFFP-85-DW-012422	XA26028-007	Potable water	1/24/2022		X
YTC-OFFP-81-DW-012422	XA26028-008	Potable water	1/24/2022		X
YTC-OFFP-77-DW-012422	XA26028-009	Potable water	1/24/2022		X
YTC-FD-03-DW-012422	XA26028-010	Potable water	1/24/2022	YTC-OFFP-77-DW-012422	X
YTC-OFFP-78-DW-012422	XA26028-011	Potable water	1/24/2022		X
YTC-OFFP-92-DW-012522	XA26028-012	Potable water	1/25/2022		X
YTC-OFFP-103-DW-012522	XA26028-013	Potable water	1/25/2022		X
YTC-OFFP-100-DW-012522	XA26028-014	Potable water	1/25/2022		X
YTC-OFFP-101-DW-012522	XA26028-015	Potable water	1/25/2022		X
YTC-OFFP-72-DW-012422	XA26028-016	Potable water	1/24/2022		X
YTC-OFFP-83-DW-012422	XA26028-017	Potable water	1/24/2022		X
YTC-OFFP-104-DW-012522	XA26028-018	Potable water	1/25/2022		X
YTC-OFFP-84-DW-012422	XA26028-019	Potable water	1/24/2022		X
YTC-OFFP-88-DW-012422	XA26028-020	Potable water	1/24/2022		X

Note:

1. Stage 4 validation was performed on sample locations YTC-OFFP-59-DW-012122 and YTC-OFFP-78-DW-012422.
2. Matrix spike (MS) analysis was performed on sample location YTC-OFFP-77-DW-012422.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 1.1 for drinking water. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00216-06 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC PFAS, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Washington, August 2021, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance

DATA REVIEW REPORT

or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 1.1	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with reported results for samples in this SDG in the continuing calibration verification standards were within the method specified control limits.

DATA REVIEW REPORT

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.3 Table B-15.

The ion transitions were as specified in DoD QSM 5.3.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 1.1 must be within 70% to 130% of the true value.

Sample locations associated with surrogate exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Surrogate	%R
YTC-OFFP-86-DW-012422 Diluted Analysis	13C2 PFHxA	AC
	13C3 HFPO-DA	< 70% but > 10%
	13C6 PFDA	AC
	d5-EtFOSAA	AC

Note:

AC Acceptable

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 130%	Non-detect	No Action
	Detect	J+
< 70% but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	R
	Detect	J

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

DATA REVIEW REPORT

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The laboratory performed a MS analysis on sample location YTC-OFFP-77-DW-012422.

Sample locations associated with the MS exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
YTC-OFFP-77-DW-012422	Perfluorohexanesulfonic acid	SR>4X	--
	Perfluorooctanoic acid	> 130%	--
	Perfluorooctanesulfonic acid	SR>4X	--

Note:

SR>4X Sample result is greater than 4 times the added spike

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 130%	Non-detect	No Action
	Detect	J+
< 70% but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	X or R
	Detect	J-
SR>4X: Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 35% for water matrices and 50% for soils is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate

DATA REVIEW REPORT

sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied for water matrices and three times the LOQ for soil matrices.

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
YTC-OFFP-77-DW-012422/ YTC-FD-03-DW-012422	Perfluorobutanesulfonic acid	56	55	1.8%
	Perfluorohexanesulfonic acid	430	400	7.2%
	Perfluoroheptanoic acid	20	21	4.9%
	Perfluorohexanoic acid	72	71	1.4%
	Perfluorononanoic acid	3.8	3.8	AC
	Perfluorooctanoic acid	36	35	2.8%
	Perfluorooctanesulfonic acid	380	370	2.7%

Notes:

AC Acceptable

The calculated RPD and results between the parent sample and their associated field duplicate were acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

Sample locations associated with ion ratios outside of the control limits of 50 to 150 percent recovery are presented in the following table.

Sample Locations	Compound	Ion Ratio %R
YTC-OFFP-104-DW-012522	Perfluorooctanesulfonic acid	156%

DoD QSM 5.3 stated for Sample PFAS Identification, that if PFAS is detected with ion ratios that fail acceptance criteria, the result must be flagged.

Control limit	Sample Result	Qualification
< 50% or > 150%	Detect	J

Sample results associated with compounds that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-59-DW-012122	Perfluorohexanesulfonic acid	--	430	430 D
	Perfluorohexanoic acid	--	94	94 D
	Perfluorooctanesulfonic acid	--	350	350 D

DATA REVIEW REPORT

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-76-DW-012422	Perfluorohexanesulfonic acid	--	78	78 D
YTC-OFFP-86-DW-012422	Perfluorohexanesulfonic acid	--	83	83 D
YTC-OFFP-99-DW-012522	Perfluorohexanesulfonic acid	--	100	100 D
	Perfluorooctanesulfonic acid	--	82	82 D
YTC-OFFP-85-DW-012422	Perfluorohexanesulfonic acid	--	410	410 D
	Perfluorohexanoic acid	--	80	80 D
	Perfluorooctanesulfonic acid	--	390	390 D
YTC-OFFP-81-DW-012422	Perfluorobutanesulfonic acid	--	85	85 D
	Perfluorohexanesulfonic acid	--	650	650 D
	Perfluorohexanoic acid	--	120	120 D
	Perfluorooctanesulfonic acid	--	500	500 D
YTC-OFFP-77-DW-012422	Perfluorohexanesulfonic acid	--	430	430 D
	Perfluorohexanoic acid	--	72	72 D
	Perfluorooctanesulfonic acid	--	380	380 D
YTC-FD-03-DW-012422	Perfluorohexanesulfonic acid	--	400	400 D
	Perfluorooctanesulfonic acid	--	370	370 D
YTC-OFFP-92-DW-012522	Perfluorohexanesulfonic acid	--	100	100 D
	Perfluorooctanesulfonic acid	--	74	74 D
YTC-OFFP-100-DW-012522	Perfluorohexanesulfonic acid	--	180	180 D
	Perfluorooctanesulfonic acid	--	140	140 D
YTC-OFFP-101-DW-012522	Perfluorohexanesulfonic acid	--	120	120 D
YTC-OFFP-72-DW-012422	Perfluorohexanesulfonic acid	--	340	340 D
	Perfluorooctanesulfonic acid	--	240	240 D
YTC-OFFP-83-DW-012422	Perfluorobutanesulfonic acid	--	80	80 D
	Perfluorohexanesulfonic acid	--	570	570 D
	Perfluorohexanoic acid	--	120	120 D
	Perfluorooctanesulfonic acid	--	440	440 D
YTC-OFFP-84-DW-012422	Perfluorohexanesulfonic acid	--	110	110 D

DATA REVIEW REPORT

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-88-DW-012422	Perfluorohexanesulfonic acid	--	370	370 D
	Perfluorooctanesulfonic acid	--	330	330 D

Note: The laboratory did not report the original analysis; only the diluted result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range.	D

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate(MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field Duplicate (RPD)		X		X	
Extracted Internal Standard %R		X	X		
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Moisture Content	X				X
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
D. Ion Ratio %R		X	X		
E. Transcription/calculations acceptable		X		X	
F. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Lyndi Mott, Arcadis

SIGNATURE:

A handwritten signature in black ink, appearing to read "Lyndi Mott", is written over a light pink rectangular background. Below the signature is a solid black horizontal line.

DATE: February 15, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: February 16, 2022

Stage 3 / 4
PFAS Calibration Standards

SDG #: XA26028
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/15/2022
 Page: 1
 Validated by: LWM

Method: EPA 537 1.1

PFOA 1/19/2022 Calibration LCMSMS02 Page 756-904 of SDG XA26028

Cal Conc ng/L	Std Area	IS Area	IS Conc ng/L	Area Ratio	Calculated RF	Avg RF/ Slope	Calc Amount ng/L	%R Calc		Reported %R	
								Tvalue	ng/L		
50	38627	806400	1000	0.047901	0.9580109	0.983765	48.69	50	97.38	97.4	MATCH
100	83638	783567	1000	0.10674	1.0674007	0.983765	108.50	100	108.50	108.5	MATCH
200	166385	801900	1000	0.207488	1.0374423	0.983765	210.91	200	105.46	105.5	MATCH
500	387042	808234	1000	0.478874	0.9577474	0.983765	486.78	500	97.36	97.4	MATCH
1000	762296	818232	1000	0.931638	0.931638	0.983765	947.01	1000	94.70	94.7	MATCH
2000	1492495	758042	1000	1.968882	0.9844408	0.983765	2001.37	2000	100.07	100.1	MATCH
5000	3791818	752739	1000	5.037361	1.0074722	0.983765	5120.49	5000	102.41	102.4	MATCH
10000	7216070	722532	1000	9.987198	0.9987198	0.983765	10152.02	10000	101.52	101.5	MATCH
15000	10148073	704673	1000	14.40111	0.960074	0.983765	14638.77	15000	97.59	97.6	MATCH
20000	13205847	706418	1000	18.6941	0.9347049	0.983765	19002.60	20000	95.01	95.0	MATCH
Avg RF					0.9837651	Match					

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Cal Conc ng/L	IS Conc ng/L	Conc Ratio (x)	Std Area	IS Area	Area Ratio (y)
50	1000	0.05	38627	806400	0.0479005
100	1000	0.1	83638	783567	0.1067401
200	1000	0.2	166385	801900	0.2074885
500	1000	0.5	387042	808234	0.4788737
1000	1000	1	762296	818232	0.931638
2000	1000	2	1492495	758042	1.9688817
5000	1000	5	3791818	752739	5.0373609
10000	1000	10	7216070	722532	9.9871978
15000	1000	15	10148073	704673	14.401109
20000	1000	20	13205847	706418	18.694098

	Calculated	Reported	
Slope	0.9474072	0.983765	Match
Correlation	0.9995344	--	
r ²	0.9990689	0.997	Match

Lab calibration software used weighted concentration and forced through origin

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: XA26028
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/15/2022
 Page: 2
 Validated by: LWM

Method: EPA 537 1.1

ICV 500 1/19/2022 15:55 Page 913 of SDG XA26028
 LCMSMS02

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFBS	457.11	442.5	103.30	103.3	MATCH
PFOA	538.2	500	107.64	107.6	MATCH
PFOS	469.92	462.75	101.55	101.5	MATCH
PFHxS	468.81	456	102.81	102.8	MATCH
PFHxA	500.33	500	100.07	100.1	MATCH
PFHpA	526.70	500	105.34	105.3	MATCH

CCV 200 2/2/2022 12:50 Page 930 of SDG XA26028
 LCMSMS02

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFHxS	186.54	182	102.49	102.5	MATCH
PFHxA	196.3	200	98.15	98.2	MATCH
PFOS	178.20	185.6	96.01	96	MATCH

CCV 200 2/3/2022 11:44 Page 995 of SDG XA26028
 LCMSMS02

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFBS	175.9	176.8	99.49	99.5	MATCH
PFOA	198.31	200	99.16	99.2	MATCH
PFOS	169.54	185.6	91.35	91.3	MATCH

Stage 3 / 4
PFAS LCS

SDG #: XA26028
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/15/2022
 Page: 3
 Validated by: LWM

Method: EPA 537 1.1

LCS XQ30329-002

Page 1366 of SDG XA26028

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFHxS	1475496	209930	1000	7.028514	1.226308	5731.44	250	22.93	22	104.21	105	MATCH
PFHxA	5880254	796070	1000	7.386604	1.243824	5938.62	250	23.75	24	98.98	99	MATCH
PFOS	1372111	209930	1000	6.536041	1.194126	5473.49	250	21.89	22	99.52	98	MATCH

LCS XQ30250-002

Page 1383 of SDG XA26028

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFBS	2723015	220416	1000	12.35398	1.822347	6779.16	250	27.12	28	96.85	96	MATCH
PFOA	6307934	763553	1000	8.261292	0.983765	8397.63	250	33.59	32	104.97	105	MATCH
PFOS	1822487	220416	1000	8.268397	1.194126	6924.22	250	27.70	30	92.32	93	MATCH

Differences in %R may be due to rounding of true value

Calculated Amount ng/L = ((Area Ratio x IS Conc)/RF)

Calculated ng/L = ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS MS/MSD

SDG #: XA26028
Lab: Pace (Shealy)
Project: Yakima Training Center Off-post PFAS

Date: 2/15/2022
Page: 4
Validated by: LWM

Method: EPA 537 1.1

MS/MSD Sample ID YTC-OFFP-77-DW-012422

Page 1405 of SDG XA26028

ANALYTE PFOA

REPORTED MS %R 147

REPORTED MSD %R N/A

REPORTED RPD N/A

$$\%R = \frac{100 * (\text{MS Conc} - \text{Sample Conc})}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * |\text{MS \%R} - \text{MSD \%R}|}{\text{Average of MS MSD \%R}}$$

Sample Concentration 35.802

MS Concentration 65.115

MSD Concentration _____

MS TV 20.0

MSD TV _____

MS %R 146.57 MATCH

MSD %R _____

RPD _____

Differences in %R may be due to rounding of the true value

Stage 3 / 4
PFAS Sample Concentration

SDG #: XA26028
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/15/2022
 Page: 5
 Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-59-DW-012122 Lab ID: XA26028-001 DF=20 Page 102-121 of SDG XA26028
 LCMSMS02 2/10/2022 22:15

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxS	1526850	233105	1000	6.550053	1.226308	5341.28	1	250	427.30	430	Match
PFHxA	1287984	876813	1000	1.468938	1.243824	1180.99	1	250	94.48	94	Match
PFOS	1235117	233105	1000	5.298544	1.194126	4437.17	1	250	354.97	350	Match

YTC-OFFP-78-DW-012422 Lab ID: XA26028-011 Page 435-451 of SDG XA26028
 LCMSMS02 2/3/2022 13:26

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBS	1737871	215794	1000	8.05338	1.822347	4419.23	1	249	17.75	18	Match
PFOA	1442342	835280	1000	1.726777	0.983765	1755.27	1	249	7.05	7.0	Match
PFOS	940678	215794	1000	4.359148	1.194126	3650.49	1	249	14.66	15	Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)
 Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS Surrogate Recoveries

SDG #: XA26028
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/15/2022
 Page: 6
 Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-59-DW-012122
 Surrogate 13C6 PFDA
 REPORTED Surr %R 86

Lab ID: XA26028-001 DF=20
 Page 185-202 of SDG XA25017

Found concentration 3.4432
 True Value 4.000 (1000 ng/L x (1 ml/250 mls))
 %R 86.1 Match

Surrogate	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Raw Data Value ng/L
13C6 PFDA	40260	876813	1000	0.045916	1.066837	43.04	1	250	3.4432	3.4432 Match

YTC-OFFP-78-DW-012422
 Surrogate 13C2 PFHxA
 REPORTED Surr %R 103

Lab ID: XA26028-011
 Page 435-451 of SDG XA26028

Found concentration 4.1192
 True Value 4.016 (1000 ng/L x (1 ml/249 mls))
 %R 102.6 Match

Surrogate	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Raw Data Value ng/L
13C2 PFHxA	1002820	835280	1000	1.200579	1.170507	1025.69	1	249	4.1192	4.1192 Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Slope)
 Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS

PACE ANALYTICAL SERVICES, LLC



Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised: 9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Areadis Cooler Inspected by/date: JSH / 01/26/2022 Lot #: XA26028

Means of receipt: <input type="checkbox"/> Pace <input type="checkbox"/> Client <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Other: _____	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1. Were custody seals present on the cooler?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	2. If custody seals were present, were they intact and unbroken?
pH Strip ID: <u>NA</u> Chlorine Strip ID: <u>NA</u> Tested by: <u>NA</u>	
Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: <u>NA</u> <u>2.6 / 2.6</u> °C <u>NA / NA</u> °C <u>NA / NA</u> °C <u>NA / NA</u> °C	
Method: <input checked="" type="checkbox"/> Temperature Blank <input type="checkbox"/> Against Bottles IR Gun ID: <u>5</u> IR Gun Correction Factor: <u>0</u> °C	
Method of coolant: <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Ice Packs <input type="checkbox"/> Dry Ice <input type="checkbox"/> None	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	4. Is the commercial courier's packing slip attached to this form?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. Were proper custody procedures (relinquished/received) followed?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6. Were sample IDs listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7. Were sample IDs listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. Was collection date & time listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9. Was collection date & time listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. Did all container label information (ID, date, time) agree with the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. Were tests to be performed listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	13. Was adequate sample volume available?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	14. Were all samples received within 1/2 the holding time or 48 hours, whichever comes first?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (1/4" or 6mm in diameter) in any of the VOA vials?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	19. Were all applicable NH ₃ /TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	21. Was the quote number listed on the container label? If yes, Quote # <u>24028</u>
Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)	
Sample(s) <u>NA</u> were received incorrectly preserved and were adjusted accordingly in sample receiving with <u>NA</u> mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # <u>NA</u>	
Time of preservation <u>NA</u> . If more than one preservative is needed, please note in the comments below.	
Sample(s) <u>NA</u> were received with bubbles >6 mm in diameter.	
Sample(s) <u>NA</u> were received with TRC > 0.5 mg/L (If #19 is no) and were adjusted accordingly in sample receiving with sodium thiosulfate (Na ₂ S ₂ O ₃) with Shealy ID: <u>NA</u>	
SR barcode labels applied by: <u>JSH</u> Date: <u>01/26/2022</u>	

Comments:

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-001**

Description: **YTC-OFFP-59-DW-012122**

Matrix: **Aqueous**

Date Sampled: **01/21/2022 1147**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1739	JJG	02/01/2022 1058	30329
2	537.1	537.1	20	02/10/2022 2215	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	8.0	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	54		2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	430	D	40	20	8.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	25		2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	94	D	40	20	8.0	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	4.2		2.0	1.0	0.80	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	59		2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	350	D	40	20	8.0	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		88	70-130		94	70-130
13C3-HFPO-DA		87	70-130		93	70-130
13C6_PFDA		91	70-130		86	70-130
d5-EtFOSAA		100	70-130		100	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-002**

Description: **YTC-OFFP-80-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 1346**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1750	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.2	4.1	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	15		2.1	1.1	0.41	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	54		2.1	1.1	0.41	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.1	1.1	0.82	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	4.7		2.1	1.1	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	14		2.1	1.1	0.41	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	U	2.1	1.1	0.82	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	9.7		2.1	1.1	0.41	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.1	1.1	0.82	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	27		2.1	1.1	0.41	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		86	70-130
13C3-HFPO-DA		86	70-130
13C6_PFDA		92	70-130
d5-EtFOSAA		105	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-003**

Description: **YTC-OFFP-76-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 1610**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1812	JJG	02/01/2022 1058	30329
2	537.1	537.1	5	02/10/2022 2248	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	23		2.0	1.0	0.39	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	78	D	9.8	4.9	2.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	7.4		2.0	1.0	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	23		2.0	1.0	0.39	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	10		2.0	1.0	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	11		2.0	1.0	0.39	ng/L	1

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		84	70-130		104	70-130
13C3-HFPO-DA		85	70-130		97	70-130
13C6_PFDA		85	70-130		102	70-130
d5-EtFOSAA		103	70-130		114	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-004**

Description: **YTC-OFFP-86-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 1644**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1823	JJG	02/01/2022 1058	30329
2	537.1	537.1	5	02/10/2022 2259	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.8	3.9	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	22		2.0	1.0	0.39	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	83	Q DJ-	9.8	4.9	2.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.78	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	6.9		2.0	1.0	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	25		2.0	1.0	0.39	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.78	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	12		2.0	1.0	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.78	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	54		2.0	1.0	0.39	ng/L	1

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		79	70-130		78	70-130
13C3-HFPO-DA		80	70-130	N	69	70-130
13C6_PFDA		86	70-130		70	70-130
d5-EtFOSAA		104	70-130		85	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-005**

Description: **YTC-OFFP-89-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 1032**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1834	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.2	U	8.4	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	9.1		2.1	1.1	0.42	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	31		2.1	1.1	0.42	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.1	1.1	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	2.9		2.1	1.1	0.42	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	11		2.1	1.1	0.42	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	U	2.1	1.1	0.84	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	4.1		2.1	1.1	0.42	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.1	1.1	0.84	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	9.4		2.1	1.1	0.42	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		92	70-130
13C3-HFPO-DA		89	70-130
13C6_PFDA		93	70-130
d5-EtFOSAA		98	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-006**

Description: **YTC-OFFP-99-DW-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 0911**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/02/2022 1845	JJG	02/01/2022 1058	30329
2	537.1	537.1	5	02/10/2022 2310	JJG	02/01/2022 1058	30329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.8	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	14		1.9	0.95	0.39	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	100	D	9.7	4.9	1.9	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.78	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	5.8		1.9	0.95	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	15		1.9	0.95	0.39	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	J	1.9	0.95	0.78	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	10		1.9	0.95	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.78	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	82	D	9.7	4.9	1.9	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		87	70-130		105	70-130
13C3-HFPO-DA		89	70-130		95	70-130
13C6_PFDA		94	70-130		100	70-130
d5-EtFOSAA		97	70-130		101	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-007**

Description: **YTC-OFFP-85-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 1506**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1231	JJG	02/02/2022 1217	30478
2	537.1	537.1	20	02/08/2022 1523	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	57		1.8	0.90	0.37	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	410	D	37	19	7.4	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.74	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	22		1.8	0.90	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	80	D	37	19	7.4	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	4.2		1.8	0.90	0.74	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	45		1.8	0.90	0.37	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.74	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	390	D	37	19	7.4	ng/L	2

Surrogate	Run 1			Run 2		
	Q	% Recovery	Acceptance Limits	Q	% Recovery	Acceptance Limits
13C2_PFHxA		94	70-130		99	70-130
13C3-HFPO-DA		93	70-130		93	70-130
13C6_PFDA		88	70-130		96	70-130
d5-EtFOSAA		82	70-130		83	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-008**

Description: **YTC-OFFP-81-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 1444**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1242	JJG	02/02/2022 1217	30478
2	537.1	537.1	20	02/08/2022 1534	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	85	D	36	18	7.3	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	650	D	36	18	7.3	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.73	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	29		1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	120	D	36	18	7.3	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	5.6		1.8	0.90	0.73	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	63		1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.73	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	500	D	36	18	7.3	ng/L	2

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		95	70-130		107	70-130
13C3-HFPO-DA		94	70-130		95	70-130
13C6_PFDA		88	70-130		92	70-130
d5-EtFOSAA		89	70-130		92	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-009**

Description: **YTC-OFFP-77-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 1343**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1253	JJG	02/02/2022 1217	30478
2	537.1	537.1	20	02/08/2022 1545	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.35	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	56		1.8	0.90	0.35	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	430	D	35	18	7.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.70	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.35	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	20		1.8	0.90	0.35	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	72	D	35	18	7.0	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	3.8		1.8	0.90	0.70	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	36	S J+	1.8	0.90	0.35	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.35	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.70	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	380	D	35	18	7.0	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		96	70-130		100	70-130
13C3-HFPO-DA		91	70-130		96	70-130
13C6_PFDA		89	70-130		88	70-130
d5-EtFOSAA		93	70-130		94	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-010**

Description: **YTC-FD-03-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1315	JJG	02/02/2022 1217	30478
2	537.1	537.1	20	02/08/2022 1556	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.2	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	55		2.0	1.0	0.41	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	400	D	41	21	8.2	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.82	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	21		2.0	1.0	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	71		2.0	1.0	0.41	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	3.8		2.0	1.0	0.82	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	35		2.0	1.0	0.41	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.82	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	370	D	41	21	8.2	ng/L	2

Surrogate	Run 1			Run 2		
	Q	% Recovery	Acceptance Limits	Q	% Recovery	Acceptance Limits
13C2_PFHxA		94	70-130		110	70-130
13C3-HFPO-DA		91	70-130		93	70-130
13C6_PFDA		95	70-130		95	70-130
d5-EtFOSAA		99	70-130		96	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-011**

Description: **YTC-OFFP-78-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 0850**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1326	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	8.0	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	18		2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	53		2.0	1.0	0.40	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	4.0		2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	15		2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	7.0		2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	15		2.0	1.0	0.40	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		103	70-130
13C3-HFPO-DA		91	70-130
13C6_PFDA		86	70-130
d5-EtFOSAA		88	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-012**

Description: **YTC-OFFP-92-DW-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 0936**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1337	JJG	02/02/2022 1217	30478
2	537.1	537.1	5	02/08/2022 1618	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	16		2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	100	D	10	5.0	2.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	5.5		2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	17		2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	10		2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	74	D	10	5.0	2.0	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		90	70-130		87	70-130
13C3-HFPO-DA		86	70-130		88	70-130
13C6_PFDA		90	70-130		90	70-130
d5-EtFOSAA		86	70-130		85	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-013**

Description: **YTC-OFFP-103-DW-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 1218**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1348	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.6	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.8	J	1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		97	70-130
13C3-HFPO-DA		90	70-130
13C6_PFDA		93	70-130
d5-EtFOSAA		89	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-014**

Description: **YTC-OFFP-100-DW-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 1010**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1359	JJG	02/02/2022 1217	30478
2	537.1	537.1	10	02/08/2022 1651	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.2	4.1	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	30		2.1	1.1	0.41	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	180	D	21	11	4.1	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.1	1.1	0.82	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	11		2.1	1.1	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	37		2.1	1.1	0.41	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	2.0	J	2.1	1.1	0.82	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	20		2.1	1.1	0.41	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.1	1.1	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.1	1.1	0.82	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	140	D	21	11	4.1	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		98	70-130		104	70-130
13C3-HFPO-DA		93	70-130		94	70-130
13C6_PFDA		87	70-130		95	70-130
d5-EtFOSAA		85	70-130		84	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-015**

Description: **YTC-OFFP-101-DW-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 1151**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1410	JJG	02/02/2022 1217	30478
2	537.1	537.1	5	02/08/2022 1629	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.4	U	2.8	1.4	0.70	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.4	U	2.8	1.4	0.70	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	5.5	U	11	5.5	2.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.4	U	2.8	1.4	0.70	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.4	U	2.8	1.4	0.56	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.4	U	2.8	1.4	0.70	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	19		2.8	1.4	0.56	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	120	D	14	7.0	2.8	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.4	U	2.8	1.4	1.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.4	U	2.8	1.4	0.56	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	5.2		2.8	1.4	0.56	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	28		2.8	1.4	0.56	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.4	U	2.8	1.4	1.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	7.4		2.8	1.4	0.56	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.4	U	2.8	1.4	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.4	U	2.8	1.4	0.70	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.4	U	2.8	1.4	1.1	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	79		2.8	1.4	0.56	ng/L	1

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		87	70-130		101	70-130
13C3-HFPO-DA		91	70-130		93	70-130
13C6_PFDA		85	70-130		86	70-130
d5-EtFOSAA		92	70-130		91	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-016**

Description: **YTC-OFFP-72-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 0911**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1421	JJG	02/02/2022 1217	30478
2	537.1	537.1	10	02/08/2022 1702	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	45		1.8	0.90	0.36	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	340	D	18	9.0	3.6	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	17		1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	59		1.8	0.90	0.36	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	2.8		1.8	0.90	0.72	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	33		1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	240	D	18	9.0	3.6	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		106	70-130		100	70-130
13C3-HFPO-DA		96	70-130		93	70-130
13C6_PFDA		94	70-130		89	70-130
d5-EtFOSAA		101	70-130		100	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-017**

Description: **YTC-OFFP-83-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 0916**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1443	JJG	02/02/2022 1217	30478
2	537.1	537.1	20	02/08/2022 1607	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	80	D	40	20	7.9	ng/L	2
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	570	D	40	20	7.9	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	26		2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	120	D	40	20	7.9	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	5.1		2.0	1.0	0.79	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	54		2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	440	D	40	20	7.9	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		87	70-130		103	70-130
13C3-HFPO-DA		89	70-130		95	70-130
13C6_PFDA		88	70-130		96	70-130
d5-EtFOSAA		99	70-130		89	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-018**

Description: **YTC-OFFP-104-DW-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 1116**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1453	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.8	3.9	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	2.1		2.0	1.0	0.39	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.3	J	2.0	1.0	0.39	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.78	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.5	J	2.0	1.0	0.39	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.78	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	2.4		2.0	1.0	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.78	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	2.4	J	2.0	1.0	0.39	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		104	70-130
13C3-HFPO-DA		94	70-130
13C6_PFDA		97	70-130
d5-EtFOSAA		92	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-019**

Description: **YTC-OFFP-84-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 0953**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1504	JJG	02/02/2022 1217	30478
2	537.1	537.1	5	02/08/2022 1640	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	1.1	U	2.2	1.1	0.54	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	1.1	U	2.2	1.1	0.54	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.3	U	8.6	4.3	2.2	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.2	1.1	0.54	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.2	1.1	0.43	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.2	1.1	0.54	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	19		2.2	1.1	0.43	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	110	D	11	5.5	2.2	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.2	1.1	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.2	1.1	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	8.5		2.2	1.1	0.43	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	25		2.2	1.1	0.43	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	J	2.2	1.1	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	15		2.2	1.1	0.43	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.2	1.1	0.43	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.2	1.1	0.54	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.2	1.1	0.86	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	74		2.2	1.1	0.43	ng/L	1

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		99	70-130		105	70-130
13C3-HFPO-DA		94	70-130		96	70-130
13C6_PFDA		92	70-130		93	70-130
d5-EtFOSAA		98	70-130		102	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA26028-020**

Description: **YTC-OFFP-88-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 1412**

Date Received: **01/26/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1515	JJG	02/02/2022 1217	30478
2	537.1	537.1	10	02/10/2022 2204	JJG	02/02/2022 1217	30478

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	41		2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	370	D	20	10	4.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	15		2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	52		2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	2.9		2.0	1.0	0.79	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	26		2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	330	D	20	10	4.0	ng/L	2

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		100	70-130		105	70-130
13C3-HFPO-DA		100	70-130		98	70-130
13C6_PFDA		103	70-130		96	70-130
d5-EtFOSAA		107	70-130		102	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #XA27031

Analyses Performed By:

Pace South Carolina

formerly Shealy Environmental Services

West Columbia, South Carolina

Report #44527R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # XA27031 for samples collected in association with the Yakima Training Center Site. The review was conducted as a Stage 3/4 evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-110-DW-012622	XA27031-001	Potable water	1/26/2022		X
YTC-OFFP-102-DW-012522	XA27031-004	Potable water	1/25/2022		X
YTC-OFFP-FD-04-012522	XA27031-007	Potable water	1/25/2022	YTC-OFFP-102-DW-012522	X
YTC-OFFP-106-DW-012622	XA27031-008	Potable water	1/26/2022		X
YTC-FRB-05-DW-012622	XA27031-009	Potable water	1/26/2022		X
YTC-FRB-04-DW-012522	XA27031-010	Potable water	1/25/2022		X
YTC-OFFP-105-DW-012622	XA27031-011	Potable water	1/26/2022		X
YTC-OFFP-118-DW-012622	XA27031-012	Potable water	1/26/2022		X
YTC-OFFP-117-DW-012622	XA27031-013	Potable water	1/26/2022		X
YTC-OFFP-94-DW-012622	XA27031-014	Potable water	1/26/2022		X
YTC-OFFP-120-DW-012622	XA27031-015	Potable water	1/26/2022		X
YTC-OFFP-FD-05-012622	XA27031-016	Potable water	1/26/2022	YTC-OFFP-120-DW-012622	X
YTC-OFFP-116-DW-012622	XA27031-017	Potable water	1/26/2022		X
YTC-OFFP-111-DW-012622	XA27031-018	Potable water	1/26/2022		X

Note:

1. Stage 4 validation was performed on sample location YTC-OFFP-118-DW-012622.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample locations YTC-OFFP-102-DW-012522 and YTC-OFFP-120-DW-012622.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 1.1 for drinking water. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00216-06 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC PFAS, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Washington, August 2021, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance

DATA REVIEW REPORT

or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 1.1	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

DATA REVIEW REPORT

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.3 Table B-15.

The ion transitions were as specified in DoD QSM 5.3.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 1.1 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

The MS/MSD analysis performed on sample location YTC-OFFP-120-DW-012622 exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
YTC-OFFP-102-DW-012522	GenX	<70% but >10%	<70% but >10%
	Perfluorobutanesulfonic acid	<70% but >10%	<70% but >10%
	Perfluorohexanoic acid	<70% but >10%	AC

Note:

AC Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

DATA REVIEW REPORT

Control Limit	Sample Result	Qualification
> 130%	Non-detect	No Action
	Detect	J+
< 70% but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	X or R
	Detect	J-

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
YTC-OFFP-102-DW-012522/ YTC-OFFP-FD-04-012522	Perfluorobutanesulfonic acid	4.0	3.8	AC
	Perfluorohexanesulfonic acid	2.6	2.8	
	Perfluorooctanesulfonic acid	1.2 J	1.2 J	
YTC-OFFP-120-DW-012622/ YTC-OFFP-FD-05-012622	All target PFAS compounds	U	U	AC

Notes:

AC Acceptable

The calculated results between the parent sample and their associated field duplicate were acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

10. System Performance and Overall Assessment

Sample location YTC-OFFP-118-DW-012622 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample

DATA REVIEW REPORT

was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of methanol. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using methanol by transfer pipet. The sample results were not qualified for this sample preparation modification.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate(MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate Standard %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Moisture Content	X				X
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs/Correlation Coefficient		X		X	
Continuing calibration %Rs		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
D. Ion Ratio %R		X		X	
E. Transcription/calculations acceptable		X		X	
F. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

- %RSD Relative standard deviation
- %R Percent recovery
- RPD Relative percent difference
- %D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Lyndi Mott, Arcadis

SIGNATURE:



DATE: February 15, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: February 16, 2022

Stage 3 / 4
PFAS Calibration Standards

SDG #: XA27031
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/16/2022
 Page: 1
 Validated by: LWM

Method: EPA 537 1.1

PFOS 1/19/2022 Calibration LCMSMS02 Page 300-448 of SDG XA27031

Cal Conc ng/L	Std Area	IS Area	IS Conc ng/L	Area Ratio	Calculated RF	Avg RF/ Slope	Calc Amount ng/L	%R Calc		Reported %R	
								Tvalue	ng/L		
46.4	13720	222748	1000	0.061594	1.3274627	1.194126	51.58	46.4	111.17	111.2	MATCH
92.8	27500	224895	1000	0.122279	1.3176647	1.194126	102.40	92.8	110.35	110.3	MATCH
185.6	47895	217208	1000	0.220503	1.1880546	1.194126	184.66	185.6	99.49	99.5	MATCH
464	119264	224279	1000	0.531766	1.1460479	1.194126	445.32	464	95.97	96	MATCH
928	248819	226821	1000	1.096984	1.1820948	1.194126	918.65	928	98.99	99	MATCH
1856	476094	231423	1000	2.057246	1.1084299	1.194126	1722.80	1856	92.82	92.8	MATCH
4640	1194264	226406	1000	5.274878	1.1368271	1.194126	4417.35	4640	95.20	95.2	MATCH
9280	2306649	207235	1000	11.1306	1.1994176	1.194126	9321.12	9280	100.44	100.4	MATCH
13920	3425190	211759	1000	16.17494	1.1619931	1.194126	13545.42	13920	97.31	97.3	MATCH
18560	4529957	208026	1000	21.77592	1.1732714	1.194126	18235.86	18560	98.25	98.3	MATCH
Avg RF					1.1941264	Match					

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Cal Conc ng/L	IS Conc ng/L	Conc Ratio (x)	Std Area	IS Area	Area Ratio (y)
46.4	1000	0.0464	13720	222748	0.0615943
92.8	1000	0.0928	27500	224895	0.1222793
185.6	1000	0.1856	47895	217208	0.2205029
464	1000	0.464	119264	224279	0.5317662
928	1000	0.928	248819	226821	1.096984
1856	1000	1.856	476094	231423	2.0572458
4640	1000	4.64	1194264	226406	5.2748779
9280	1000	9.28	2306649	207235	11.130596
13920	1000	13.92	3425190	211759	16.174944
18560	1000	18.56	4529957	208026	21.775917

	Calculated	Reported	
Slope	1.1732375	1.194126	Match
Correlation	0.9998879	--	
r ²	0.9997759	0.995	Match

Lab calibration software used weighted concentration and forced through origin

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: XA27031
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/16/2022
 Page: 2
 Validated by: LWM

Method: EPA 537 1.1

ICV 500 1/19/2022 15:55 Page 457 of SDG XA27031
 LCMSMS02

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFBS	457.11	442.5	103.30	103.3	MATCH
PFOA	538.2	500	107.64	107.6	MATCH
PFOS	469.92	462.75	101.55	101.5	MATCH

CCV 200 2/3/2022 11:44 Page 609 of SDG XA27031
 LCMSMS02

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFBS	175.9	176.8	99.49	99.5	MATCH
PFOA	198.31	200	99.16	99.2	MATCH
PFOS	169.54	185.6	91.35	91.3	MATCH

CCV 1000 2/3/2022 20:00 Page 669 of SDG XA27031
 LCMSMS02

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFBS	830.07	884	93.90	93.9	MATCH
PFOA	985.12	1000	98.51	98.5	MATCH
PFOS	890.66	928	95.98	96	MATCH

Stage 3 / 4
PFAS LCS

SDG #: XA27031
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/16/2022
 Page: 3
 Validated by: LWM

Method: EPA 537 1.1

LCS XQ30566-002

Page 861 of SDG XA27031

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFBS	354811	223987	1000	1.58407	1.822347	869.25	250	3.48	3.5	99.34	98	MATCH
PFOA	956730	898888	1000	1.064348	0.983765	1081.91	250	4.33	4.0	108.19	108	MATCH
PFOS	249316	223987	1000	1.113082	1.194126	932.13	250	3.73	3.7	100.77	100	MATCH

Differences in %R may be due to rounding of true value

Calculated Amount ng/L = ((Area Ratio x IS Conc)/RF)

Calculated ng/L = ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS MS/MSD

SDG #: XA27031
Lab: Pace (Shealy)
Project: Yakima Training Center Off-post PFAS

Date: 2/16/2022
Page: 4
Validated by: LWM

Method: EPA 537 1.1

MS/MSD Sample ID YTC-OFFP-102-DW-012522

Page 895 and 927 of SDG XA27031

ANALYTE PFBS
REPORTED MS %R 53
REPORTED MSD %R 53
REPORTED RPD 0.95

$$\%R = \frac{100 * (\text{MS Conc} - \text{Sample Conc})}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * |\text{MS \%R} - \text{MSD \%R}|}{\text{Average of MS MSD \%R}}$$

Sample Concentration 4.0
MS Concentration 5.7785
MSD Concentration 5.7239
MS TV 3.3
MSD TV 3.3

MS %R 53.89 MATCH
MSD %R 52.24
RPD 0.95

Differences in %R may be due to rounding of the true value

Stage 3 / 4
PFAS Sample Concentration

SDG #: XA27031
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/16/2022
 Page: 5
 Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-118-DW-012622

Lab ID: XA27031-012

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LCMSMS02 2/3/2022 20:22

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFBS	583167	234874	1000	2.482893	1.822347	1362.47	1	225	6.06	6.1
PFOA	976425	877464	1000	1.112781	0.983765	1131.14	1	225	5.03	5.0
PFOS	1245342	234874	1000	5.302171	1.194126	4440.21	1	225	19.73	20

Match
Match
Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS Surrogate Recoveries

SDG #: XA27031 Date: 2/16/2022
 Lab: Pace (Shealy) Page: 6
 Project: Yakima Training Center Off-post PFAS Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-118-DW-012622 Lab ID: XA27031-012
 Surrogate 13C6 PFDA Page 183-205 of SDG XA27031
 REPORTED Surr %R 87

Found concentration 3.8634
 True Value 4.444 (1000 ng/L x (1 ml/225 mls))
 %R 86.9 Match

Surrogate	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Raw Data Value ng/L
13C6 PFDA	813725	877464	1000	0.92736	1.066837	869.26	1	225	3.8634	3.8634

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Slope)
 Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS



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PACE ANALYTICAL SERVICES, LLC

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Address		Sampler's Signature <i>Andrew Kopechynski</i>		Analysis (Attach list if more space is needed)		Page <u>2</u> of <u>2</u>
City	State	Zip Code	Printed Name Andrew Kopechynski		Lot # Bar Code	

Project No. 30059433.YTC00	PO No.	Matrix	No. of Containers by Preservative Type	Matrix										Other	Lot # Bar Code XA27031
				GENE	APPROX	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER		
Sample ID / Description (Containers for each sample may be indicated on one line.)	Collection Date(s)	Collection Time (MSTG)	GENE	APPROX	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER
YTC-OFFP-105-DW-012622	01-26-22	09:55	G	X											X
YTC-OFFP-1K1-DW-012622	01-26-22	08:54													
YTC-OFFP-117-DW-012622	01-26-22	13:47													
YTC-OFFP-94-DW-012622	01-26-22	12:41													
YTC-OFFP-120-DW-012622	01-26-22	10:53													
YTC-OFFP-140-05-012622	01-26-22	10:53													
YTC-OFFP-FD-05-012622	01-26-22	—													
YTC-OFFP-116-DW-012622	01-26-22	13:06													
YTC-OFFP-111-DW-012622	01-26-22	09:27													
YTC-OFFP-MS-05-012622	01-26-22	10:53													

Turn Around Time Required (Prior lab approval required for expedited TAT.) <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush (Specify)		Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab		Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison <input type="checkbox"/> Unknown			QC Requirements (Specify)	
1. Relinquished by <i>Andrew Kopechynski</i>	Date 01-26-22	Time 13:30	1. Received by <i>FedEx</i>	Date 1/27/22	Time 10:15	Date 1/27/22	Time 10:15	
2. Relinquished by	Date	Time	2. Received by	Date	Time	Date	Time	
3. Relinquished by	Date	Time	3. Received by	Date	Time	Date	Time	
4. Relinquished by <i>FedEx</i>	Date 1/27/22	Time 10:15	4. Laboratory received by <i>Ch...</i>	Date 1/27/22	Time 10:15	Date	Time	
Note: All samples are retained for four weeks from receipt unless other arrangements are made.				LAB USE ONLY Received on ice (Circle) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Ice Pack		Receipt Temp. <u>5.8</u> °C		

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Fix/Client Copy

Document Number: ME033N2-01

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-001**

Description: **YTC-OFFP-110-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 1319**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1810	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	3.7		1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		80	70-130
13C3-HFPO-DA		88	70-130
13C6_PFDA		98	70-130
d5-EtFOSAA		111	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-004**

Description: **YTC-OFFP-102-DW-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 1239**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1821	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U JJ	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	4.0	S J-	2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	2.6		2.0	1.0	0.40	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.0	U JJ	2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.2	J	2.0	1.0	0.40	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		87	70-130
13C3-HFPO-DA		82	70-130
13C6_PFDA		94	70-130
d5-EtFOSAA		108	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-007**

Description: **YTC-OFFP-FD-04-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1916	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.4	3.7	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	3.8		1.9	0.95	0.37	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	2.8		1.9	0.95	0.37	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.74	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.74	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.74	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.2	J	1.9	0.95	0.37	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		83	70-130
13C3-HFPO-DA		76	70-130
13C6_PFDA		87	70-130
d5-EtFOSAA		111	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-008**

Description: **YTC-OFFP-106-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 1253**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1927	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.39	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.95	U	1.9	0.95	0.39	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		95	70-130
13C3-HFPO-DA		92	70-130
13C6_PFDA		96	70-130
d5-EtFOSAA		105	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-009**

Description: **YTC-FRB-05-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 1502**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1938	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	U	2.2	1.1	0.55	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	U	2.2	1.1	0.55	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.4	U	8.7	4.4	2.2	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.2	1.1	0.55	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.2	1.1	0.55	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.2	1.1	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	U	2.2	1.1	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.2	1.1	0.55	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.2	1.1	0.87	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.1	U	2.2	1.1	0.44	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		86	70-130
13C3-HFPO-DA		85	70-130
13C6_PFDA		87	70-130
d5-EtFOSAA		106	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-010**

Description: **YTC-FRB-04-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 1430**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 1949	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.2	U	2.3	1.2	0.58	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.2	U	2.3	1.2	0.58	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.7	U	9.3	4.7	2.3	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.2	U	2.3	1.2	0.58	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.2	U	2.3	1.2	0.46	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.2	U	2.3	1.2	0.58	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.2	U	2.3	1.2	0.46	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.2	U	2.3	1.2	0.46	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.2	U	2.3	1.2	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.2	U	2.3	1.2	0.46	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.2	U	2.3	1.2	0.46	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.2	U	2.3	1.2	0.46	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.2	U	2.3	1.2	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.2	U	2.3	1.2	0.46	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.2	U	2.3	1.2	0.46	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.2	U	2.3	1.2	0.58	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.2	U	2.3	1.2	0.93	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.2	U	2.3	1.2	0.46	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		91	70-130
13C3-HFPO-DA		84	70-130
13C6_PFDA		91	70-130
d5-EtFOSAA		102	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-011**

Description: **YTC-OFFP-105-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 0955**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 2011	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	3.3		1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	3.9		1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	2.2		1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		91	70-130
13C3-HFPO-DA		88	70-130
13C6_PFDA		97	70-130
d5-EtFOSAA		108	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-012**

Description: **YTC-OFFP-118-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 0854**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022	JJG	02/02/2022	1724 30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	U	2.2	1.1	0.56	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	U	2.2	1.1	0.56	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.5	U	8.9	4.5	2.2	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.2	1.1	0.56	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.2	1.1	0.56	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	6.1		2.2	1.1	0.44	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	12		2.2	1.1	0.44	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.2	1.1	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.1	J	2.2	1.1	0.44	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	8.4		2.2	1.1	0.44	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	U	2.2	1.1	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	5.0		2.2	1.1	0.44	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.2	1.1	0.44	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.2	1.1	0.56	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.2	1.1	0.89	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	20		2.2	1.1	0.44	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		97	70-130
13C3-HFPO-DA		83	70-130
13C6_PFDA		87	70-130
d5-EtFOSAA		116	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-013**

Description: **YTC-OFFP-117-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 1347**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 2033	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	U	2.1	1.1	0.53	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	U	2.1	1.1	0.53	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.3	U	8.5	4.3	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.1	1.1	0.53	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.1	1.1	0.43	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.1	1.1	0.53	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.1	U	2.1	1.1	0.43	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.3	J	2.1	1.1	0.43	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.1	1.1	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.1	1.1	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.1	U	2.1	1.1	0.43	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.1	U	2.1	1.1	0.43	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	U	2.1	1.1	0.85	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.1	U	2.1	1.1	0.43	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.1	1.1	0.43	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.1	1.1	0.53	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.1	1.1	0.85	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.1	U	2.1	1.1	0.43	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		88	70-130
13C3-HFPO-DA		84	70-130
13C6_PFDA		89	70-130
d5-EtFOSAA		102	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-014**

Description: **YTC-OFFP-94-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 1244**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 2044	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.79	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		83	70-130
13C3-HFPO-DA		77	70-130
13C6_PFDA		94	70-130
d5-EtFOSAA		103	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-015**

Description: **YTC-OFFP-120-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 1053**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/05/2022 1513	MMM	02/03/2022 1250	30645

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.6	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		108	70-130
13C3-HFPO-DA		104	70-130
13C6_PFDA		117	70-130
d5-EtFOSAA		109	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-016**

Description: **YTC-OFFP-FD-05-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 2055	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	8.0	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		85	70-130
13C3-HFPO-DA		80	70-130
13C6_PFDA		88	70-130
d5-EtFOSAA		107	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-017**

Description: **YTC-OFFP-116-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 1306**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 2105	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.2	U	8.3	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.1	1.1	0.83	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	U	2.1	1.1	0.83	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.1	1.1	0.41	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.1	1.1	0.83	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.1	U	2.1	1.1	0.41	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		85	70-130
13C3-HFPO-DA		81	70-130
13C6_PFDA		86	70-130
d5-EtFOSAA		104	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA27031-018**

Description: **YTC-OFFP-111-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 0927**

Date Received: **01/27/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 2116	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	7.0		2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.1	J	2.0	1.0	0.40	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	3.3		2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	2.4		2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		88	70-130
13C3-HFPO-DA		84	70-130
13C6_PFDA		94	70-130
d5-EtFOSAA		110	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
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Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #XA28030

Analyses Performed By:

Pace South Carolina

formerly Shealy Environmental Services

West Columbia, South Carolina

Report #44526R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # XA28030 for samples collected in association with the Yakima Training Center Site. The review was conducted as a Stage 3/4 evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-93-DW-012522	XA28030-001	Potable water	1/25/2022		X
YTC-OFFP-95-DW-012522	XA28030-002	Potable water	1/25/2022		X
YTC-OFFP-91-DW-012522	XA28030-003	Potable water	1/25/2022		X
YTC-OFFP-79-DW-012422	XA28030-004	Potable water	1/24/2022		X
YTC-OFFP-90-DW-012522	XA28030-005	Potable water	1/25/2022		X
YTC-OFFP-108-DW-012622	XA28030-006	Potable water	1/26/2022		X
YTC-OFFP-96-DW-012522	XA28030-007	Potable water	1/25/2022		X
YTC-OFFP-113-DW-012622	XA28030-008	Potable water	1/26/2022		X
YTC-OFFP-112-DW-012622	XA28030-009	Potable water	1/26/2022		X
YTC-OFFP-114-DW-012622	XA28030-010	Potable water	1/26/2022		X
YTC-OFFP-97-DW-012522	XA28030-011	Potable water	1/25/2022		X
YTC-OFFP-46-DW-012622	XA28030-012	Potable water	1/26/2022		X
YTC-OFFP-115-DW-012722	XA28030-013	Potable water	1/27/2022		X
YTC-OFFP-51-DW-012722	XA28030-014	Potable water	1/27/2022		X
YTC-OFFP-43-DW-012722	XA28030-015	Potable water	1/27/2022		X
YTC-OFFP-121-DW-012722	XA28030-016	Potable water	1/27/2022		X

Note:

1. Stage 4 validation was performed on sample locations YTC-OFFP-93-DW-012522 and YTC-OFFP-51-DW-012722.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 1.1 for drinking water. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00216-06 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC PFAS, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Washington, August 2021, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance

DATA REVIEW REPORT

or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 1.1	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with reported results for samples in this SDG in the continuing calibration verification standards were within the method specified control limits.

DATA REVIEW REPORT

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.3 Table B-15.

The ion transitions were as specified in DoD QSM 5.3.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 1.1 must be within 70% to 130% of the true value.

Sample locations associated with surrogate exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Surrogate	%R
YTC-OFFP-95-DW-012522 Diluted Analysis	13C2 PFHxA	AC
	13C3 HFPO-DA	AC
	13C6 PFDA	AC
	d5-EtFOSAA	> 130%
YTC-OFFP-91-DW-012522 Diluted Analysis	13C2 PFHxA	AC
	13C3 HFPO-DA	AC
	13C6 PFDA	> 130%
	d5-EtFOSAA	AC

Note:

AC Acceptable

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 130%	Non-detect	No Action
	Detect	J+
< 70% but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	R
	Detect	J

DATA REVIEW REPORT

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

A MS/MSD analysis was not performed on a sample location associated with this SDG.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 35% for water matrices and 50% for soils is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied for water matrices and three times the LOQ for soil matrices.

A field duplicate was not collected for a sample location associated with this SDG.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

Sample locations associated with ion ratios outside of the control limits of 50 to 150 % recovery are presented in the following table.

Sample Locations	Compound	Ion Ratio %R
YTC-OFFP-96-DW-012522	Perfluorooctanesulfonic acid	209%

DoD QSM 5.3 stated for Sample PFAS Identification, that if PFAS is detected with ion ratios that fail acceptance criteria, the result must be flagged.

Control limit	Sample Result	Qualification
< 50% or >150%	Detect	J

DATA REVIEW REPORT

Sample results associated with compounds that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-95-DW-012522	Perfluorohexanesulfonic acid	--	73	73 D
YTC-OFFP-91-DW-012522	Perfluorohexanesulfonic acid	--	270	270 D
	Perfluorooctanesulfonic acid	--	310	310 D
YTC-OFFP-51-DW-012722	Perfluorohexanesulfonic acid	--	89	89 D
	Perfluorooctanesulfonic acid	--	73	73 D

Note: The laboratory did not report the original analysis; only the diluted result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range.	D

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate(MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field Duplicate (RPD)		X		X	
Extracted Internal Standard %R		X	X		
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Moisture Content	X				X
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs/Correlation Coefficient		X		X	
Continuing calibration %Rs		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 1.1	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
D. Ion Ratio %R		X	X		
E. Transcription/calculations acceptable		X		X	
F. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Lyndi Mott, Arcadis

SIGNATURE:

A handwritten signature in black ink, appearing to read "Lyndi Mott", is written over a light pink rectangular background. Below the signature is a solid black horizontal line.

DATE: February 15, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: February 16, 2022

Stage 3 / 4
PFAS Calibration Standards

SDG #: XA28030
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/15/2022
 Page: 1
 Validated by: LWM

Method: EPA 537 1.1

PFOS 1/19/2022 Calibration LCMSMS02 Page 369-517 of SDG XA28030

Cal Conc ng/L	Std Area	IS Area	IS Conc ng/L	Area Ratio	Calculated RF	Avg RF/ Slope	Calc Amount ng/L	%R Calc		Reported %R	
								Tvalue	ng/L		
46.4	13720	222748	1000	0.061594	1.3274627	1.194126	51.58	46.4	111.17	111.2	MATCH
92.8	27500	224895	1000	0.122279	1.3176647	1.194126	102.40	92.8	110.35	110.3	MATCH
185.6	47895	217208	1000	0.220503	1.1880546	1.194126	184.66	185.6	99.49	99.5	MATCH
464	119264	224279	1000	0.531766	1.1460479	1.194126	445.32	464	95.97	96	MATCH
928	248819	226821	1000	1.096984	1.1820948	1.194126	918.65	928	98.99	99	MATCH
1856	476094	231423	1000	2.057246	1.1084299	1.194126	1722.80	1856	92.82	92.8	MATCH
4640	1194264	226406	1000	5.274878	1.1368271	1.194126	4417.35	4640	95.20	95.2	MATCH
9280	2306649	207235	1000	11.1306	1.1994176	1.194126	9321.12	9280	100.44	100.4	MATCH
13920	3425190	211759	1000	16.17494	1.1619931	1.194126	13545.42	13920	97.31	97.3	MATCH
18560	4529957	208026	1000	21.77592	1.1732714	1.194126	18235.86	18560	98.25	98.3	MATCH
Avg RF					1.1941264	Match					

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Cal Conc ng/L	IS Conc ng/L	Conc Ratio (x)	Std Area	IS Area	Area Ratio (y)
46.4	1000	0.0464	13720	222748	0.0615943
92.8	1000	0.0928	27500	224895	0.1222793
185.6	1000	0.1856	47895	217208	0.2205029
464	1000	0.464	119264	224279	0.5317662
928	1000	0.928	248819	226821	1.096984
1856	1000	1.856	476094	231423	2.0572458
4640	1000	4.64	1194264	226406	5.2748779
9280	1000	9.28	2306649	207235	11.130596
13920	1000	13.92	3425190	211759	16.174944
18560	1000	18.56	4529957	208026	21.775917

	Calculated	Reported	
Slope	1.1732375	1.194126	Match
Correlation	0.9998879	--	
r ²	0.9997759	0.995	Match

Lab calibration software used weighted concentration and forced through origin

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: XA28030
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/15/2022
 Page: 2
 Validated by: LWM

Method: EPA 537 1.1

ICV 500 1/19/2022 15:55 Page 526 of SDG XA28030
 LCMSMS02

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFBS	457.11	442.5	103.30	103.3	MATCH
PFOA	538.2	500	107.64	107.6	MATCH
PFOS	469.92	462.75	101.55	101.5	MATCH
PFHxS	468.81	456	102.81	102.8	MATCH
PFHxA	500.33	500	100.07	100.1	MATCH
PFHpA	526.70	500	105.34	105.3	MATCH

CCV 200 2/3/2022 11:44 Page 825 of SDG XA28030
 LCMSMS02

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFHxS	168.01	182	92.31	92.3	MATCH
PFHpA	186.66	200	93.33	93.3	MATCH
PFOA	198.31	200	99.16	99.2	MATCH

CCV 200 2/7/2022 17:33 Page 939 of SDG XA28030
 LCMSMS02

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFBS	186.85	176.8	105.68	105.7	MATCH
PFOA	211.91	200	105.96	106	MATCH
PFOS	202.16	185.6	108.92	108.9	MATCH

Stage 3 / 4
PFAS LCS

SDG #: XA28030
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/15/2022
 Page: 3
 Validated by: LWM

Method: EPA 537 1.1

LCS XQ30566-002 Page 1278 of SDG XA28030

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFHxS	241339	223987	1000	1.077469	1.226308	878.63	250	3.51	3.6	97.63	97	MATCH
PFHpA	863437	898888	1000	0.960561	1.061595	904.83	250	3.62	4.0	90.48	90	MATCH
PFOA	956730	898888	1000	1.064348	0.983765	1081.91	250	4.33	4.0	108.19	108	MATCH

LCS XQ30765-002 Page 1312 of SDG XA28030

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFBS	333270	218443	1000	1.525661	1.822347	837.20	250	3.35	3.5	95.68	95	MATCH
PFOA	821426	829506	1000	0.990259	0.983765	1006.60	250	4.03	4.0	100.66	101	MATCH
PFOS	232624	218443	1000	1.064919	1.194126	891.80	250	3.57	3.7	96.41	96	MATCH

Differences in %R may be due to rounding of true value

Calculated Amount ng/L = ((Area Ratio x IS Conc)/RF)

Calculated ng/L = ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS Sample Concentration

SDG #: XA28030
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/15/2022
 Page: 4
 Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-93-DW-012522 Lab ID: XA28030-001 Page 75-97 of SDG XA28030
 LCMSMS02 2/3/2022 21:27

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxS	4061193	243543	1000	16.67547	1.226308	13598.11	1	246	55.28	55	Match
PFHpA	1128921	993413	1000	1.136407	1.061595	1070.47	1	246	4.35	4.4	Match
PFOA	1778896	993413	1000	1.790691	0.983765	1820.24	1	246	7.40	7.4	Match

YTC-OFFP-51-DW-012722 Lab ID: XA28030-014 Page 301-338 of SDG XA28030
 LCMSMS02 2/7/2022 19:55

Analyte	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBS	1663993	225648	1000	7.374286	1.822347	4046.59	1	273	14.82	15	Match
PFOA	3665185	959329	1000	3.820571	0.983765	3883.62	1	273	14.23	14	Match
PFOS 5X	1073337	224692	1000	4.776926	1.194126	4000.35	1	273	73.27	73	Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)
 Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

Stage 3 / 4
PFAS Surrogate Recoveries

SDG #: XA28030
 Lab: Pace (Shealy)
 Project: Yakima Training Center Off-post PFAS

Date: 2/15/2022
 Page: 5
 Validated by: LWM

Method: EPA 537 1.1

YTC-OFFP-93-DW-012522
 Surrogate 13C6 PFDA
 REPORTED Surr %R 91

Lab ID: XA28030-001
 Page 75-97 of SDG XA28030

Found concentration 3.7040
 True Value 4.065 (1000 ng/L x (1 ml/246 mls))
 %R 91.1 Match

Surrogate	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Raw Data Value ng/L
13C6 PFDA	965673	993413	1000	0.972076	1.066837	911.18	1	246	3.7040	3.704

YTC-OFFP-51-DW-012722
 Surrogate 13C2 PFHxA
 REPORTED Surr %R 98

Lab ID: XA28030-014
 Page 301-338 of SDG XA28030

Found concentration 3.6079
 True Value 3.663 (1000 ng/L x (1 ml/273 mls))
 %R 98.5 Match

Surrogate	Area	IS Area	IS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Raw Data Value ng/L
13C2 PFHxA	1106013	959329	1000	1.152903	1.170507	984.96	1	273	3.6079	3.6079

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Slope)
 Calculated ng/L = DF x ((calculated ng/L x 1 ml) / extracted sample volume mls)

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS

PACE ANALYTICAL SERVICES, LLC



Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised: 9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Accadis

Cooler Inspected by/date: CBP / 1/28/22

Lot #: VA 28030

Means of receipt: <input type="checkbox"/> Pace <input type="checkbox"/> Client <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Other: _____	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1. Were custody seals present on the cooler?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	2. If custody seals were present, were they intact and unbroken?
pH Strip ID: <u>NA</u> Chlorine Strip ID: <u>NA</u> Tested by: <u>NA</u>	
Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: <u>NA</u> <u>4.5/4.5 °C NA/NA °C NA/NA °C NA/NA °C</u>	
Method: <input checked="" type="checkbox"/> Temperature Blank <input type="checkbox"/> Against Bottles IR Gun ID: <u>5</u> IR Gun Correction Factor: <u>0</u> °C	
Method of coolant: <input type="checkbox"/> Wet Ice <input checked="" type="checkbox"/> Ice Packs <input type="checkbox"/> Dry Ice <input type="checkbox"/> None	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	4. Is the commercial courier's packing slip attached to this form?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. Were proper custody procedures (relinquished/received) followed?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6. Were sample IDs listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7. Were sample IDs listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. Was collection date & time listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9. Was collection date & time listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. Did all container label information (ID, date, time) agree with the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. Were tests to be performed listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	13. Was adequate sample volume available?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	14. Were all samples received within 1/2 the holding time or 48 hours, whichever comes first?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (1/4" or 6mm in diameter) in any of the VOA vials?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	19. Were all applicable NH ₃ /TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	21. Was the quote number listed on the container label? If yes, Quote # <u>24028</u>
Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)	
Sample(s) <u>NA</u> were received incorrectly preserved and were adjusted accordingly in sample receiving with <u>NA</u> mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # <u>NA</u>	
Time of preservation <u>NA</u> . If more than one preservative is needed, please note in the comments below.	
Sample(s) <u>NA</u> were received with bubbles >6 mm in diameter.	
Samples(s) <u>NA</u> were received with TRC > 0.5 mg/L (If #19 is no) and were adjusted accordingly in sample receiving with sodium thiosulfate (Na ₂ S ₂ O ₃) with Shealy ID: <u>NA</u>	
SR barcode labels applied by: <u>CBP</u> Date: <u>1/28/22</u>	

Comments:

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-001**

Description: **YTC-OFFP-93-DW-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 1316**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/03/2022 2127	JJG	02/02/2022 1724	30566

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.1	U	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	16		2.0	1.0	0.41	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	55		2.0	1.0	0.41	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	4.4		2.0	1.0	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	17		2.0	1.0	0.41	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	7.4		2.0	1.0	0.41	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.41	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.81	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	16		2.0	1.0	0.41	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		86	70-130
13C3-HFPO-DA		82	70-130
13C6_PFDA		91	70-130
d5-EtFOSAA		107	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-002**

Description: **YTC-OFFP-95-DW-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 1457**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/05/2022 1545	MMM	02/03/2022 1250	30645
2	537.1	537.1	5	02/08/2022 2006	MMM	02/03/2022 1250	30645

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.6	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	24		1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	73	Q DJ+	9.5	4.8	1.9	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	7.5		1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	33		1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	13		1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	43		1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		101	70-130		123	70-130
13C3-HFPO-DA		102	70-130		125	70-130
13C6_PFDA		122	70-130		121	70-130
d5-EtFOSAA		124	70-130	N	131	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-003**

Description: **YTC-OFFP-91-DW-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 1036**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/05/2022 1555	MMM	02/03/2022 1250	30645
2	537.1	537.1	10	02/08/2022 2017	MMM	02/03/2022 1250	30645

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	31		1.8	0.90	0.36	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	270	Q DJ+	18	9.0	3.6	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	15		1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	36		1.8	0.90	0.36	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	2.6		1.8	0.90	0.72	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	22		1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	310	Q DJ+	18	9.0	3.6	ng/L	2

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_PFHxA		100	70-130		118	70-130
13C3-HFPO-DA		102	70-130		110	70-130
13C6_PFDA		127	70-130	N	133	70-130
d5-EtFOSAA		118	70-130		127	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-004**

Description: **YTC-OFFP-79-DW-012422**

Matrix: **Aqueous**

Date Sampled: **01/24/2022 1609**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/05/2022 1606	MMM	02/03/2022 1250	30645

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.6	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	12		1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	42		1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	3.7		1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	14		1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	5.1		1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	17		1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		111	70-130
13C3-HFPO-DA		103	70-130
13C6_PFDA		119	70-130
d5-EtFOSAA		110	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-005**

Description: **YTC-OFFP-90-DW-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 1543**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/05/2022 1617	MMM	02/03/2022 1250	30645

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.2	U	8.4	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.1	U	2.1	1.1	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.1	U	2.1	1.1	0.84	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.1	U	2.1	1.1	0.42	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.1	U	2.1	1.1	0.52	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.1	U	2.1	1.1	0.84	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.1	U	2.1	1.1	0.42	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		85	70-130
13C3-HFPO-DA		88	70-130
13C6_PFDA		118	70-130
d5-EtFOSAA		112	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-006**

Description: **YTC-OFFP-108-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 1004**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/05/2022 1627	MMM	02/03/2022 1250	30645

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	2.4		1.8	0.90	0.37	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.74	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.74	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.74	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.90	U	1.8	0.90	0.37	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		88	70-130
13C3-HFPO-DA		103	70-130
13C6_PFDA		111	70-130
d5-EtFOSAA		110	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-007**

Description: **YTC-OFFP-96-DW-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 1511**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/05/2022 1638	MMM	02/03/2022 1250	30645

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.85	U	1.7	0.85	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.85	U	1.7	0.85	0.44	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.85	U	1.7	0.85	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.85	U	1.7	0.85	0.35	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.85	U	1.7	0.85	0.44	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	0.85	U	1.7	0.85	0.35	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.6	J	1.7	0.85	0.35	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.85	U	1.7	0.85	0.70	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.85	U	1.7	0.85	0.35	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.6	J	1.7	0.85	0.35	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	3.9		1.7	0.85	0.35	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.85	U	1.7	0.85	0.70	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	4.3		1.7	0.85	0.35	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.85	U	1.7	0.85	0.35	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.85	U	1.7	0.85	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.85	U	1.7	0.85	0.70	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	2.2	J	1.7	0.85	0.35	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		101	70-130
13C3-HFPO-DA		108	70-130
13C6_PFDA		115	70-130
d5-EtFOSAA		122	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-008**

Description: **YTC-OFFP-113-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 0430**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/07/2022 1900	JJG	02/04/2022 1145	30765

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	8.0	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		96	70-130
13C3-HFPO-DA		88	70-130
13C6_PFDA		97	70-130
d5-EtFOSAA		106	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-009**

Description: **YTC-OFFP-112-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 1032**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/07/2022 1911	JJG	02/04/2022 1145	30765

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.4	3.7	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	2.9		1.9	0.95	0.37	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	4.4		1.9	0.95	0.37	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.74	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	3.0		1.9	0.95	0.37	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.74	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.74	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.95	U	1.9	0.95	0.37	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		101	70-130
13C3-HFPO-DA		87	70-130
13C6_PFDA		95	70-130
d5-EtFOSAA		89	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-010**

Description: **YTC-OFFP-114-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 1343**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/07/2022 1922	JJG	02/04/2022 1145	30765

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.6	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.76	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		114	70-130
13C3-HFPO-DA		103	70-130
13C6_PFDA		110	70-130
d5-EtFOSAA		109	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-011**

Description: **YTC-OFFP-97-DW-012522**

Matrix: **Aqueous**

Date Sampled: **01/25/2022 1632**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/08/2022 2027	MMM	02/03/2022 1250	30645

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.3	J	1.8	0.90	0.36	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.96	J	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.36	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.72	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.90	U	1.8	0.90	0.36	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		100	70-130
13C3-HFPO-DA		80	70-130
13C6_PFDA		118	70-130
d5-EtFOSAA		111	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-012**

Description: **YTC-OFFP-46-DW-012622**

Matrix: **Aqueous**

Date Sampled: **01/26/2022 1834**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/07/2022 1933	JJG	02/04/2022 1145	30765

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.6	J	1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	5.9		1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.75	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		100	70-130
13C3-HFPO-DA		93	70-130
13C6_PFDA		97	70-130
d5-EtFOSAA		106	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-013**

Description: **YTC-OFFP-115-DW-012722**

Matrix: **Aqueous**

Date Sampled: **01/27/2022 0756**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/07/2022 1944	JJG	02/04/2022 1145	30765

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.74	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.74	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.74	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.90	U	1.8	0.90	0.37	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		98	70-130
13C3-HFPO-DA		91	70-130
13C6_PFDA		102	70-130
d5-EtFOSAA		112	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XA28030-014
Description: YTC-OFFP-51-DW-012722	Matrix: Aqueous
Date Sampled: 01/27/2022 0854	
Date Received: 01/28/2022	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/07/2022 1955	JJG	02/04/2022 1145	30765
2	537.1	537.1	5	02/10/2022 2321	JJG	02/04/2022 1145	30765

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	15		1.8	0.90	0.37	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	89	D	9.2	4.6	1.8	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.90	U	1.8	0.90	0.73	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	9.7		1.8	0.90	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	31		1.8	0.90	0.37	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.90	U	1.8	0.90	0.73	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	14		1.8	0.90	0.37	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.90	U	1.8	0.90	0.37	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.90	U	1.8	0.90	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.90	U	1.8	0.90	0.73	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	73	D	9.2	4.6	1.8	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		
	Q	% Recovery		Q	% Recovery	
13C2_PFHxA		98	70-130		102	70-130
13C3-HFPO-DA		90	70-130		98	70-130
13C6_PFDA		104	70-130		107	70-130
d5-EtFOSAA		117	70-130		122	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-015**

Description: **YTC-OFFP-43-DW-012722**

Matrix: **Aqueous**

Date Sampled: **01/27/2022 0839**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/07/2022 2006	JJG	02/04/2022 1145	30765

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	4.0	U	8.0	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	1.0	U	2.0	1.0	0.40	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	1.0	U	2.0	1.0	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	1.0	U	2.0	1.0	0.80	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	1.0	U	2.0	1.0	0.40	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		96	70-130
13C3-HFPO-DA		90	70-130
13C6_PFDA		99	70-130
d5-EtFOSAA		112	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
 H = Out of holding time W = Reported on wet weight basis LOD = Limit of Detection S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XA28030-016**

Description: **YTC-OFFP-121-DW-012722**

Matrix: **Aqueous**

Date Sampled: **01/27/2022 0932**

Date Received: **01/28/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537.1	537.1	1	02/07/2022 2028	JJG	02/04/2022 1145	30765

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	537.1	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-1-butane sulfonic acid (PFBS)	375-73-5	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537.1	0.95	U	1.9	0.95	0.38	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537.1	0.95	U	1.9	0.95	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537.1	0.95	U	1.9	0.95	0.77	ng/L	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	537.1	0.95	U	1.9	0.95	0.38	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_PFHxA		115	70-130
13C3-HFPO-DA		99	70-130
13C6_PFDA		101	70-130
d5-EtFOSAA		112	70-130

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range DL = Detection Limit Q = Surrogate failure
 U = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40% J = Estimated result < LOQ and ≥ DL L = LCS/LCSD failure
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Off-Post Sampling USAEC Baltimore PFAS
Joint Base Lewis-McChord Yakima Training Center

DATA USABILITY SUMMARY REPORT

Summer 2022 Sampling Event

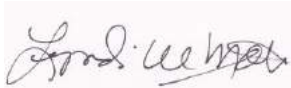
October 10, 2022

DATA USABILITY SUMMARY REPORT

Summer 2022 Sampling Event

Prepared for:

U.S. Army Environmental Command
U.S. Army Corps of Engineers Baltimore District
JBLM Yakima Training Center, Washington



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Contract W912DR-18-D-0009
Arcadis Project: 30059933

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TABLES

Table 1. Data Usability Summary Table

ATTACHMENTS

Data Validation Reports

ACRONYMS AND ABBREVIATIONS

%D	percent difference
%R	percent recovery
Arcadis	Arcadis U.S., Inc.
DoD	Department of Defense
DUSR	data usability summary report
DVR	data validation report
EIS	extracted internal standards
ELAP	Environmental Laboratory Accreditation Program
ELLE	Eurofins Lancaster Laboratory Environmental
FRB	field reagent blank
ICV/CCV	initial calibration verification/continuing calibration verification
JBLM	Joint Base Lewis-McChord
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
LOQ	limit of quantitation
MS/MSD	matrix spike/matrix spike duplicate
NELAP	National Environmental Laboratory Accreditation Program
PFAS	per/polyfluoroalkyl substances
PQAPP	Programmatic Uniform Federal Policy-Quality Assurance Project Plan
QAPP	Quality Assurance Project Plan
QC	quality control
QSM	Quality System Manual
RPD	relative percent difference
SDG	sample delivery group
USDOD	United States Department of Defense
USEPA	United States Environmental Protection Agency
YTC	Yakima Training Center

EXECUTIVE SUMMARY

This Data Usability Summary Report (DUSR) for Joint Base Lewis-McChord (JBLM) Yakima Training Center located in Washington for the July 2022 sampling event describes the findings of the data review and validation and is provided to document the quality of the analytical data used for project decisions. A Data Usability Summary Table at the end of this DUSR lists the data that was qualified and the reason for qualification. Only the sample locations associated with this site and sampling event in the associated laboratory data packages and data validation reports are addressed in this report. The text below adds details where further discussion is warranted. The project-specific sampling and analysis, overall quality control (QC), and quality assurance protocols are presented in the Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan (PQAPP Arcadis 2019), and the Uniform Federal Policy-Quality Assurance Project Plan Addendum for Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances Joint Base Lewis-McChord Yakima Training Center (YTC), Washington (QAPP Addendum Arcadis 2021).

Samples were shipped to Eurofins Lancaster Laboratory Environmental (ELLE) located in Lancaster, Pennsylvania for analysis. ELLE is a United States Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP) and National Environmental Laboratory Accreditation Program (NELAP) accredited laboratories. The analytical sample delivery groups (SDGs) and associated Arcadis validation reports are listed in the table below. Summaries of the sample IDs and their associated laboratory IDs, SDGs, sampling dates, and analyses performed are provided in the laboratory reports and data validation reports (DVRs). Note the result pages in the DVRs may have a red line through specific or all compounds to indicate those results are not reportable. Results will be reported from either the initial, diluted, or re-extracted analysis.

In accordance with the project QAPP review requirements a 10% Stage 4 validation of the analytical data was performed by Arcadis project Chemists that was independent of the project team. A Stage 4 validation includes all of Stage 1, Stage 2A, Stage 2B and Stage 3 requirements; is a qualitative review of non-detected and detected results from instrument outputs; and includes review of chromatograms. The remaining 100% of the data went through a Stage 2b which, deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP Arcadis, 2019), however was conducted in accordance with the guidelines, control criteria specified in the following documents, and had no to little impact on the outcome of this data summary and usability report:

USDOD. Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 May 2019.

USDOD. DoD General Data Validation Guidelines, November 2019.

USEPA. Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018.

Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan (PQAPP Arcadis 2019).

Uniform Federal Policy-Quality Assurance Project Plan Addendum for Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances Joint Base Lewis-McChord Yakima Training Center (YTC), Washington (QAPP Addendum Arcadis 2021).

The laboratory data packages and validation reports that were reviewed for this DUSR are listed below.

DATA USABILITY SUMMARY REPORT

Sample Delivery Groups (SDG)	Validation Report	Matrix	Parameters	Validation Level
410-93076-1	46643R	Potable water	PFAS	Stage 2b: 10 field samples Stage 3/4: 2 field samples
410-93082-1	46660R	Potable water	PFAS	Stage 2b: 12 field samples 2 field duplicates Stage 3/4: 2 field samples
410-93092-1	46494R	Potable water	PFAS	Stage 2b: 11 field samples 1 field duplicate Stage 3/4: 1 field sample
410-93099-1	46633R	Potable water	PFAS	Stage 2b: 9 field samples; 1 field duplicate Stage 3/4: 1 field sample
410-93105-1	46632R	Potable water	PFAS	Stage 2b: 15 field samples; 1 field duplicate Stage 4: 2 field samples
410-93111-1	46635R	Potable water	PFAS	Stage 2b: 12 field samples; 1 field duplicate Stage 3/4: 2 field samples
410-93119-1	46676R	Potable water	PFAS	Stage 2b: 16 field samples Stage 3/4: 2 field samples
410-93134-1	46589R	Potable water	PFAS	Stage 2b: 10 field samples 1 field duplicate Stage 3/4: 2 field samples
410-93136-1	46534R	Potable water	PFAS	Stage 2b: 15 field samples Stage 3/4: 2 field samples
410-93621-1	46702R	Potable water	PFAS	Stage 2b: 15 field samples Stage 3/4: 2 field samples
410-93623-1	46596R	Potable water	PFAS	Stage 2b: 13 field samples Stage 3/4: 2 field samples
410-93629-1	46585R	Potable water	PFAS	Stage 2b: 8 field samples 1 field duplicate Stage 3/4: 2 field samples
410-93634-1	46636R	Potable water	PFAS	Stage 2b: 14 field samples 2 field duplicates Stage 3/4: 2 field samples

DATA USABILITY SUMMARY REPORT

Sample Delivery Groups (SDG)	Validation Report	Matrix	Parameters	Validation Level
410-93882-1	46588R	Potable water	PFAS	Stage 2b: 8 field samples Stage 3/4: 1 field sample

PRECISION

Precision is expressed as a relative percent difference (RPD) between the results of replicate sample analyses: sample duplicates, laboratory control sample duplicates (LCSDs), and matrix spike duplicates (MSDs). The RPD limit for LCSDs and MSDs is 30 percent. Field duplicates were collected at a frequency of 5 percent. Unless documented below or in the Data Usability Summary table, the RPD between the parent samples and associated field duplicates were within method specified limits of 30 percent for water matrix.

Potable water sample YTC-OFFP-223-DW-080122 was identified as the parent sample to field duplicate YTC-OFFP-FD-06-DW-080122. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

Potable water sample YTC-OFFP-302-DW-080122 was identified as the parent sample to field duplicate YTC-OFFP-FD-10-DW-080122. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

Potable water sample YTC-OFFP-124-DW-072522 was identified as the parent sample to field duplicate YTC-OFFP-FD-01-DW-072522. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

Potable water sample YTC-OFFP-143-DW-072622 was identified as the parent sample to field duplicate YTC-FD02-072622. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

Potable water sample YTC-OFFP-203-DW-072922 was identified as the parent sample to field duplicate YTC-FD-05-DW-072922. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

Potable water sample YTC-OFFP-163-DW-072722 was identified as the parent sample to field duplicate YTC-OFFP-FD-03-DW-072722. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

Potable water sample YTC-OFFP-183-DW-072822 was identified as the parent sample to field duplicate YTC-OFFP-FD-04-DW-072822. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

Potable water sample YTC-OFFP-282-DW-080422 was identified as the parent sample to field duplicate YTC-OFFP-FD-09-DW-080422. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

DATA USABILITY SUMMARY REPORT

Potable water sample YTC-OFFP-242-DW-080222 was identified as the parent sample to field duplicate YTC-OFFP-FD-07-DW-080222. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

Potable water sample YTC-OFFP-263-DW-080322 was identified as the parent sample to field duplicate YTC-OFFP-FD-08-DW-080322. The evaluation of the parent sample and field duplicate indicate precision was within criteria of 30 percent RPD.

ACCURACY

Accuracy is demonstrated by recovery of target analytes from fortified blank and sample matrices, LCS/LCSDs and MS/MSDs, respectively. The recovery of target analytes from fortified samples is compared to acceptance criteria. The criteria for LCS/LCSDs and MS/MSDs are 70 to 130 percent as listed in USEPA method 537.1. The criteria for surrogate recoveries are 70 to 130 percent. In addition, Stage 4 validation of initial and continuing calibration results provide information on analytical accuracy. Unless documented below or in the Data Usability Summary table, the recoveries of LCS, MS/MSD, surrogates, and calibration criteria, were within acceptable limits.

REPRESENTATIVENESS

Representativeness is the degree to which sample data accurately and precisely represent site conditions and is dependent on sampling and analytical variability and the variability (or homogeneity) of the site itself. The use of the prescribed field and laboratory analytical methods with associated holding times and preservation requirements are intended to provide representative data.

All samples were collected and submitted for analysis in accordance with the procedures and sampling plan specified in the site QAPP and field SOPs except for the collection of field reagent blanks (FRB). The method requires collection of field reagent blanks daily at the site. However, FRBs were not collected and submitted for analysis with the samples collected on August 3 and 4, 2022 and reported in SDG 410-93623-1.

Analysis of samples was in accordance with the USACE PFAS PA/SI PQAPP, USACE PFAS QAPP Addendum, USEPA method 537.1, and laboratory SOPs. All hold times were met except for the re-extracted analysis of sample location YTC-OFFP-281-DW-072722 and YTC-OFFP-289-DW-072822 as noted in the Data Usability Summary Table. The initial analysis exhibited method blank contamination. The re-extracted analyses were performed at 22 days and 26 days from collection. Therefore, the impact on the reported data should be minimal.

SENSITIVITY

Sensitivity describes the relationship between the laboratory quantitation limits and the project action limits. Reported laboratory quantitation limits are compared to the project detection limits to ensure that the analytical methods are capable of quantifying target analytes to a level that would satisfy DQOs.

Many samples required a secondary dilution to report all PFAS compounds within the calibration range. All reported results from the diluted analysis were for detections of PFAS. The sample results from the initial undiluted analysis met sensitivity requirements.

COMPLETENESS

The completeness for this data set met the criteria of 90 percent. No results were rejected due to quality control deficiencies.

The field completeness did not meet 100% completeness goals. 200 samples were planned to be collected, 188 were collected plus an additional 5 wells were sampled that were scheduled for the January 2022 sample event. Therefore, the field completeness was 96.5 percent. Of the sample locations that were not sampled, seven wells were not collected due to lack of power, or the well could not be located. Five wells were noted to be connected to a well location on an adjacent property that was sampled during this sampling event.

CONCLUSIONS

The overall assessment of the field samples, QA/QC data review by manual validation of the July 2022 data set from JBLM YTC met the project requirements and analytical completeness goals of the SI. The field completeness goal was not met as noted above. The data quality objectives were to determine presence or absence of PFAS, that detections are valid, and to evaluate uncertainty. This DUSR deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP Arcadis, 2019), however was conducted in accordance with applicable guidelines and control criteria. This deviation had little impact on the usability of the data to make project decisions and met the data quality objectives. All results were determined to be valid and usable. Qualified results are usable with caution.

DATA USABILITY SUMMARY TABLE

DATA USABILITY SUMMARY TABLE
Joint Base Lewis-McChord Yakima Training Center; Summer 2022 Off-Post Sampling Event

Sample Locations	Compound	Qualifier	Reason
YTC-OFFP-136-DW-072622 YTC-OFFP-257-DW-072622 YTC-OFFP-162-DW-072722	All target PFAS compounds	UJ non-detects J- detects	Surrogates %R; low bias
YTC-OFFP-142-DW-072622 YTC-OFFP-136-DW-072622 YTC-OFFP-145-DW-072622 YTC-OFFP-FD02-072622 YTC-OFFP-251-DW-072622 YTC-OFFP-264-DW-072622 YTC-OFFP-138-DW-072622 YTC-OFFP-257-DW-072622 YTC-OFFP-137-DW-072622	N-EtFOSAA N-MeFOSAA Perfluorohexanesulfonic acid Perfluorooctanesulfonic acid 9CI-PF3ONS 11CI-PF3OUdS	UJ non-detects J- detects	LCS/LCSD %R; low bias
YTC-OFFP-280-DW-080122 YTC-OFFP-292-DW-080122	N-MeFOSAA Perfluorodecanoic acid Perfluorononanoic acid Perfluorooctanoic acid Perfluorooctanesulfonic acid	UJ non-detects J- detects	LCS %R; low bias
YTC-OFFP-281-DW-072722 RE	All target PFAS compounds	UJ non-detects J detects	Re-extraction performed past holding time at 22 days from collection. Re-extracted due to method blank contamination
YTC-OFFP-162-DW-072722 YTC-OFFP-238-DW-072722 YTC-OFFP-152-DW-072722 YTC-OFFP-151-DW-072722 YTC-OFFP-155-DW-072722 YTC-OFFP-148-DW-072722 YTC-OFFP-158-DW-072722 YTC-OFFP-157-DW-072722 YTC-OFFP-159-DW-072722 YTC-OFFP-318-DW-072722	Perfluorohexanoic acid Perfluorooctanoic acid	UB at LOQ	Method blank contamination
YTC-OFFP-313-DW-072722	Perfluorohexanoic acid	UB at LOQ	Method blank contamination
YTC-OFFP-163-DW-072722 YTC-OFFP-156-DW-072722 YTC-OFFP-FD-03-DW-072722 YTC-OFFP-227-DW-072722 YTC-OFFP-153-DW-072722 YTC-OFFP-164-DW-072722 YTC-OFFP-165-DW-072722 YTC-OFFP-319-DW-072722 YTC-OFFP-166-DW-072722 YTC-OFFP-154-DW-072722 YTC-OFFP-150-DW-072722 YTC-OFFP-128-DW-072722	Perfluorooctanoic acid	UB at LOQ	Method blank contamination
YTC-OFFP-163-DW-072722 YTC-OFFP-156-DW-072722 YTC-OFFP-FD-03-DW-072722 YTC-OFFP-227-DW-072722 YTC-OFFP-153-DW-072722 YTC-OFFP-164-DW-072722	Perfluorohexanoic acid	J+	Method blank contamination

Sample Locations	Compound	Qualifier	Reason
YTC-OFFP-165-DW-072722			
YTC-OFFP-319-DW-072722 YTC-OFFP-166-DW-072722 YTC-OFFP-154-DW-072722 YTC-OFFP-150-DW-072722 YTC-OFFP-128-DW-072722	Perfluorohexanoic acid	J+	Method blank contamination
YTC-OFFP-153-DW-072722	All target PFAS compounds	UJ non-detects	Residual chlorine present in sample
YTC-OFFP-320-DW-072922 YTC-OFFP-292-DW-080122 YTC-OFFP-302-DW-080122 YTC-OFFP-FD-10-DW-080122 YTC-OFFP-213-DW-072822 YTC-OFFP-285-DW-080422 YTC-OFFP-278-DW-080422 YTC-OFFP-288-DW-080422 YTC-OFFP-279-DW-080422 YTC-OFFP-82-DW-080322 YTC-OFFP-304-DW-080322 YTC-OFFP-242-DW-080222 YTC-OFFP-FD-07-DW-080222 YTC-OFFP-86-DW-080522	Perfluorohexanesulfonic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-300-DW-072722 YTC-OFFP-287-DW-080422 YTC-OFFP-310-DW-080422 YTC-OFFP-293-DW-080522	Perfluorohexanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-289-DW-072822 RE DL	Perfluorohexanesulfonic acid Perfluorooctanesulfonic acid	DJ	Extraction performed 26 days from collection and result reported from secondary dilution
YTC-OFFP-275-DW-072822 YTC-OFFP-290-DW-080422 YTC-OFFP-271A-DW-080322 YTC-OFFP-271B-DW-080322 YTC-OFFP-294-DW-080522 YTC-OFFP-301-DW-080522 YTC-OFFP-295-DW-080522	Perfluorohexanoic acid Perfluorohexanesulfonic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-305-DW-080522	Perfluorohexanoic acid Perfluorooctanoic acid Perfluorohexanesulfonic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution
YTC-OFFP-297-DW-080522	Perfluorohexanoic acid Perfluorobutanesulfonic acid Perfluorohexanesulfonic acid Perfluorooctanesulfonic acid	D	Result reported from secondary dilution

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated due to non-conformances discovered during data validation.

- J+ (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated due to non-conformances discovered during data validation. Result may be biased high.
- J- (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated due to non-conformances discovered during data validation. Result may be biased low.
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however, the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- D (Diluted): Diluted sample result reported from a secondary dilution due to calibration range exceedance.
- UB (Contamination): Compound considered non-detect at the listed value due to associated blank contamination.
- J+ (Contamination): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration may be biased high due to associated blank contamination.
- R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in QC criteria. The analyte may or may not be present in the sample.

DATA VALIDATION REPORTS

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #410-93076-1

Analyses Performed By:

Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report #46643R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93076-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-215-DW-072922	410-93076-1	Water	7/29/2022		X
YTC-OFFP-224-DW-072922	410-93076-2	Water	7/29/2022		X
YTC-OFFP-FRB5-072922	410-93076-3	Water	7/29/2022		X
YTC-OFFP-320-DW-072922	410-93076-4	Water	7/29/2022		X
YTC-OFFP-198-DW-072922	410-93076-5	Water	7/29/2022		X
YTC-OFFP-237-DW-072922	410-93076-6	Water	7/29/2022		X
YTC-OFFP-233-DW-072922	410-93076-7	Water	7/29/2022		X
YTC-OFFP-192-DW-072922	410-93076-8	Water	7/29/2022		X
YTC-OFFP-229-DW-072922	410-93076-9	Water	7/29/2022		X
YTC-OFFP-221-DW-072922	410-93076-10	Water	7/29/2022		X
YTC-OFFP-191-DW-072922	410-93076-11	Water	7/29/2022		X
YTC-OFFP-197-DW-072922	410-93076-12	Water	7/29/2022		X
YTC-OFFP-190-DW-072922	410-93076-13	Water	7/29/2022		X

Note:

1. Stage 3/4 validation was performed on sample locations YTC-OFFP-320-DW-072922 and YTC-OFFP-197-DW-072922.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X	X		
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): YTC-OFFP-FRB5-072922 (410-93076-3). The container labels list YTC-FRB5-072922, while the COC lists YTC-OFFP-FRB5-072922. The sample ID was entered per COC.

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Yakima, Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance was acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

DATA REVIEW REPORT

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in EPA method 537 version 2.0 Table 4.

The ion transitions were as specified in EPA method 537 version 2.0 Table 4.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

An MS/MSD analysis was not performed on a sample within this SDG.

7. Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

A field duplicate analysis was not performed on a sample within this SDG.

DATA REVIEW REPORT

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-320-DW-072922	Perfluorohexane sulfonic acid	--	96	96 D
	Perfluorooctane sulfonic acid	--	68	68 D

Note: The laboratory did not report the original analysis, only the diluted result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range.	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range.	EDJ
Original sample result greater than the calibration range	EJ

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field reagent blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate(MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field Duplicate (RPD)	X				X
Surrogate Standard %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Stage 3/4 Validation					
System performance check		X		X	
Initial calibration %RSD/%R		X		X	
Continuing calibration %R/%D		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculations acceptable		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

- %RSD Relative standard deviation
- %R Percent recovery
- RPD Relative percent difference
- %D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Andrew Korycinski, Arcadis

SIGNATURE:



DATE: August 30, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: August 30, 2022

Tier 3
PFAS Calibration Standards %D

SDG #: J93076
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/30/2022
 Page: 1
 Validated by: AJK

Method: EPA Method 537.1, Version 2.0

PFOS, 08/17/2022 Calibration Instrument 24743 Page: 214

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	39334	2395371	28.68	0.016421	1.01717	1.1661	0.4039	0.463	-12.772	-12.7	MATCH
0.926	84166	2415019	28.68	0.034851	1.079405	1.1661	0.8572	0.926	-7.435	-7.4	MATCH
2.31	248878	2531157	28.68	0.098326	1.220772	1.1661	2.4183	2.31	4.688	4.5	MATCH
4.63	441447	2322468	28.68	0.190077	1.177408	1.1661	4.6749	4.63	0.970	1	MATCH
18.5	1764607	2347698	28.68	0.751633	1.165234	1.1661	18.4863	18.5	-0.074	-0.1	MATCH
Avg RF					1.131998	No Match					

PFOS, 08/22/2022 Calibration Instrument 24743 Page: 281

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	36828	2062931	28.68	0.017852	1.105838	1.1787	0.4344	0.463	-6.182	-6.1	MATCH
0.926	75488	2038494	28.68	0.037031	1.146929	1.1787	0.9010	0.926	-2.695	-2.6	MATCH
2.31	222953	2092767	28.68	0.106535	1.322695	1.1787	2.5922	2.31	12.216	12	MATCH
4.63	400256	2108407	28.68	0.189838	1.17593	1.1787	4.6191	4.63	-0.235	-0.2	MATCH
18.5	1554219	2067450	28.68	0.751757	1.165426	1.1787	18.2917	18.5	-1.126	-1.2	MATCH
Avg RF					1.183364	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: J93076
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/30/2022
Page: 2
Validated by: AJK

Method: EPA Method 537.1, Version 2.0

ICV 410-287160/8 8/17/2022 21:38:00 PM Instrument 24743 Page: 355

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D
PFBS	206807	2390105	28.68	0.086526	1.1325	2.1912362	2.21	-0.85	-0.9
PFOS	216234	2390105	28.68	0.090471	1.1661	2.2251042	2.39	-6.90	-6.9
PFOA	794880	2954589	10	0.269032	1.0304	2.6109505	2.5	4.44	4.4

Match
Match
Match

CCVLIS 410-287800/1, 8/18/2022 20:12 Instrument 24743 Page 367

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D
PFBS	1538547	2274719	28.68	0.676368	1.1325	17.12868	17.7	-3.23	-3.2
PFOS	1716104	2274719	28.68	0.754425	1.1661	18.55492	18.5	0.30	0.2
PFOA	5756227	2857972	10	2.014095	1.0304	19.54673	20	-2.27	-2.3

Match
Match
Match

ICV 410-288402/8 8/22/2022 13:49 Instrument 24743 Page: 408

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D
PFBS	208551	2104409	28.68	0.099102	1.311	2.1679965	2.21	-1.90	-2
PFOS	188987	2104409	28.68	0.089805	1.1787	2.1851318	2.39	-8.57	-8.6
PFOA	578534	2138516	10	0.270531	1.0912	2.4792026	2.5	-0.83	-0.8

Match
Match
Match

CCVIS 410-288765/87 8/24/2022 5:49 Instrument 24743 Page 422

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D
PFBS	218802	2208269	28.68	0.099083	1.311	2.16758	2.21	-1.92	-2
PFOS	227613	2208269	28.68	0.103073	1.1787	2.50796	2.31	8.57	8.4
PFOA	673180	2315650	10	0.290709	1.0912	2.66412	2.5	6.56	6.1

Match
Match
Match

Concentration ng/ml = (Peak area ratio/slope) x IS concentration

Tier 3
PFAS LCS

SDG #: J93076
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/30/2022
Page: 3
Validated by: AJK

Method: EPA Method 537.1, Version 2.0

LCS ID LCS 410-285221/2-A
ANALYTE PFOA
REPORTED LCS %R 90
REPORTED LCSD %R 97
REPORTED RPD 7

Page 20-21 (486 and 494 raw data)

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration 72.3
LCSD Concentration 77.6
LCS TV 80
LCSD TV 80

LCS %R 90.38 MATCH
LCSD %R 97.00 MATCH
RPD 7.07

%R may be different than reported due to rounding of the true value

Tier 3
PFAS Sample Concentration

SDG #: J93076
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/30/2022
 Page: 4
 Validated by: AJK

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-320-DW-072922 Lab ID: 410-93076-4 Page 137
 Instrument: 24743 8/24/2022 7:09 DL 8/24/2022 14:05

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBS	970378	2304858	28.68	0.421014	1.311	9.21	1	284.6	32.36	32	Match
PFOS 10X	206815	2607045	28.68	0.079329	1.1787	1.93	1	284.6	67.82	68	Match
PFOA	913112	2333940	10	0.391232	1.0912	3.59	1	284.6	12.60	13	Match

Sample ID: YTC-OFFP-197-DW-072922 Lab ID: 410-93076-12 Page 200
 Instrument: 24743 8/18/2022 22:30

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBS	15737	2448806	28.68	0.006426	1.1325	0.16	1	290.6	0.56	0.56	Match
PFOS	13031	2448806	28.68	0.005321	1.1661	0.13	1	290.6	0.45	0.45	Match
PFOA	58370	3120356	10	0.018706	1.0304	0.18	1	290.6	0.62	0.62	Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: J93076
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/30/2022
Page: 5
Validated by: AJK

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-320-DW-072922 Lab ID: 410-93076-4 Page 137

Surrogate 13C2 PFDA
REPORTED %R 106

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 10.6
Surrogate TV 10.0
%R 106.0 MATCH

Sample ID: YTC-OFFP-197-DW-072922 Lab ID: 410-93076-12 Page 200

Surrogate 13C2 PFHxA
REPORTED %R 97

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 9.72
Surrogate TV 10.0
%R 97.2 MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS





Chain of Custody Record

410-93076 Chain of Custody

Client Contact Andrew Kopchynski	Sampler Gordon, Stephen J	Lab PM Gordon, Stephen J	Camera Tracking No(s)	COC No 410-61650-17570.14
Company Seres Engineering & Services LLC	Phone	E-Mail Stephen.Gordon@et.eurofinsus.com	State of Origin	Page Page 14 of 25 1 of 2

Address 669 Marina Drive Suite B7	Due Date Requested:	Analysis Requested	Job #
City Charleston	TAT Requested (days):		
State, Zip SC, 29492	Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Phone 720-344-3712(Tel)	PO # D18-218 PFAS PA/SI		
Email afkopchynski@seres-es.com	WVO # 3005993.YTC00		
Project Name Yakima Training Center (YTC)	Project # 41011531	Preservation Codes:	
Site	SSOW#	A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Y - Trizma Z - other (specify)	

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=soil, BT=Tissue, A=Air)	Analysis Requested	Job #	Special Instructions/Note:
YTC-OFFP- 215-DW-072922	072922	1114	G	Drinking Water	X		
YTC-OFFP- 224-DW-072922	072922	1317	G	Drinking Water	X		
YTC-OFFP- FR05-072922	072922	1306	G	Drinking Water	X		
YTC-OFFP- 320-DW-072922	072922	1227	G	Drinking Water	X		
YTC-OFFP- 198-DW-072922	072922	1049	G	Drinking Water	X		
YTC-OFFP- 237-DW-072922	072922	0932	G	Drinking Water	X		
YTC-OFFP- 233-DW-072922	072922	1328	G	Drinking Water	X		
YTC-OFFP- 192-DW-072922	072922	1016	G	Drinking Water	X		
YTC-OFFP- 229-DW-072922	072922	1249	G	Drinking Water	X		
YTC-OFFP- 221-DW-072922	072922	1302	G	Drinking Water	X		
YTC-OFFP- 191-DW-072922	072922	0903	G	Drinking Water	X		

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time:	Company:	Received by:
Relinquished by:	Date/Time:	Company:	Received by:
Relinquished by:	Date/Time:	Company:	Received by: <i>[Signature]</i>

Cooler Temperature(s) °C and Other Remarks: 1.6

Custody Seals Intact: Yes No

Custody Seal No.:



DAR

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93076-1

Client Sample ID: YTC-OFFP-215-DW-072922

Lab Sample ID: 410-93076-1

Date Collected: 07/29/22 11:14

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
Perfluorobutanesulfonic acid	1.6	J	1.7	1.3	0.42	ng/L		08/24/22 06:35	1
Perfluorohexanesulfonic acid	0.70	J	1.7	1.3	0.42	ng/L		08/24/22 06:35	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102		70 - 130	08/11/22 14:49	08/24/22 06:35	1
13C2 PFHxA	99		70 - 130	08/11/22 14:49	08/24/22 06:35	1
13C3 HFPO-DA	95		70 - 130	08/11/22 14:49	08/24/22 06:35	1
d5-NEtFOSAA	105		70 - 130	08/11/22 14:49	08/24/22 06:35	1

Client Sample ID: YTC-OFFP-224-DW-072922

Lab Sample ID: 410-93076-2

Date Collected: 07/29/22 13:17

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 06:46	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93076-1

Client Sample ID: YTC-OFFP-224-DW-072922

Lab Sample ID: 410-93076-2

Date Collected: 07/29/22 13:17

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102		70 - 130	08/11/22 14:49	08/24/22 06:46	1
13C2 PFHxA	94		70 - 130	08/11/22 14:49	08/24/22 06:46	1
13C3 HFPO-DA	91		70 - 130	08/11/22 14:49	08/24/22 06:46	1
d5-NEtFOSAA	98		70 - 130	08/11/22 14:49	08/24/22 06:46	1

Client Sample ID: YTC-OFFP-FRB5-072922

Lab Sample ID: 410-93076-3

Date Collected: 07/29/22 13:06

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
9Cl-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
11Cl-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 06:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130	08/11/22 14:49	08/24/22 06:58	1
13C2 PFHxA	95		70 - 130	08/11/22 14:49	08/24/22 06:58	1
13C3 HFPO-DA	92		70 - 130	08/11/22 14:49	08/24/22 06:58	1
d5-NEtFOSAA	97		70 - 130	08/11/22 14:49	08/24/22 06:58	1

Client Sample ID: YTC-OFFP-320-DW-072922

Lab Sample ID: 410-93076-4

Date Collected: 07/29/22 12:27

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	52		1.8	1.3	0.44	ng/L		08/24/22 07:09	1
Perfluoroheptanoic acid	9.9		1.8	1.3	0.44	ng/L		08/24/22 07:09	1
Perfluorooctanoic acid	13		1.8	1.3	0.44	ng/L		08/24/22 07:09	1
Perfluorononanoic acid	0.93	J	1.8	1.3	0.44	ng/L		08/24/22 07:09	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 07:09	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 07:09	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 07:09	1
Perfluorobutanesulfonic acid	32		1.8	1.3	0.44	ng/L		08/24/22 07:09	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 07:09	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93076-1

Client Sample ID: YTC-OFFP-320-DW-072922

Lab Sample ID: 410-93076-4

Date Collected: 07/29/22 12:27

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 07:09	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 07:09	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 07:09	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 07:09	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/24/22 07:09	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/24/22 07:09	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 07:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	106		70 - 130	08/11/22 14:49	08/24/22 07:09	1
13C2 PFHxA	100		70 - 130	08/11/22 14:49	08/24/22 07:09	1
13C3 HFPO-DA	96		70 - 130	08/11/22 14:49	08/24/22 07:09	1
d5-NEtFOSAA	96		70 - 130	08/11/22 14:49	08/24/22 07:09	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	96	D	18	13	4.4	ng/L		08/24/22 14:05	10
Perfluorooctanesulfonic acid	68	D	18	13	4.4	ng/L		08/24/22 14:05	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	84		70 - 130	08/11/22 14:49	08/24/22 14:05	10
13C2 PFHxA	81		70 - 130	08/11/22 14:49	08/24/22 14:05	10
13C3 HFPO-DA	80		70 - 130	08/11/22 14:49	08/24/22 14:05	10
d5-NEtFOSAA	82		70 - 130	08/11/22 14:49	08/24/22 14:05	10

Client Sample ID: YTC-OFFP-198-DW-072922

Lab Sample ID: 410-93076-5

Date Collected: 07/29/22 10:49

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
Perfluoroheptanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
Perfluorooctanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
Perfluorononanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
Perfluorodecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
Perfluorotridecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
Perfluorotetradecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
Perfluorobutanesulfonic acid	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
Perfluorohexanesulfonic acid	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
Perfluorooctanesulfonic acid	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
NEtFOSAA	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
NMeFOSAA	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
Perfluoroundecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
Perfluorododecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
HFPODA	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
9CI-PF3ONS	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
11CI-PF3OUdS	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1
DONA	<1.4		1.9	1.4	0.47	ng/L		08/18/22 21:09	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93076-1

Client Sample ID: YTC-OFFP-198-DW-072922

Lab Sample ID: 410-93076-5

Date Collected: 07/29/22 10:49

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	93		70 - 130	08/11/22 16:19	08/18/22 21:09	1
13C2 PFHxA	95		70 - 130	08/11/22 16:19	08/18/22 21:09	1
13C3 HFPO-DA	94		70 - 130	08/11/22 16:19	08/18/22 21:09	1
d5-NEtFOSAA	83		70 - 130	08/11/22 16:19	08/18/22 21:09	1

Client Sample ID: YTC-OFFP-237-DW-072922

Lab Sample ID: 410-93076-6

Date Collected: 07/29/22 09:32

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
Perfluoroheptanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
Perfluorooctanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
Perfluorononanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
Perfluorodecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
Perfluorotridecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
Perfluorotetradecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
Perfluorobutanesulfonic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
Perfluorohexanesulfonic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
Perfluorooctanesulfonic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
NEtFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
NMeFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
Perfluoroundecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
Perfluorododecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
HFPODA	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
9Cl-PF3ONS	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
11Cl-PF3OUdS	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1
DONA	<1.4		1.8	1.4	0.45	ng/L		08/18/22 21:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	90		70 - 130	08/11/22 16:19	08/18/22 21:21	1
13C2 PFHxA	94		70 - 130	08/11/22 16:19	08/18/22 21:21	1
13C3 HFPO-DA	91		70 - 130	08/11/22 16:19	08/18/22 21:21	1
d5-NEtFOSAA	80		70 - 130	08/11/22 16:19	08/18/22 21:21	1

Client Sample ID: YTC-OFFP-233-DW-072922

Lab Sample ID: 410-93076-7

Date Collected: 07/29/22 13:28

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93076-1

Client Sample ID: YTC-OFFP-233-DW-072922

Lab Sample ID: 410-93076-7

Date Collected: 07/29/22 13:28

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/18/22 21:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	93		70 - 130				08/11/22 16:19	08/18/22 21:32	1
13C2 PFHxA	95		70 - 130				08/11/22 16:19	08/18/22 21:32	1
13C3 HFPO-DA	89		70 - 130				08/11/22 16:19	08/18/22 21:32	1
d5-NEtFOSAA	91		70 - 130				08/11/22 16:19	08/18/22 21:32	1

Client Sample ID: YTC-OFFP-192-DW-072922

Lab Sample ID: 410-93076-8

Date Collected: 07/29/22 10:16

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
Perfluorobutanesulfonic acid	0.94	J	1.8	1.3	0.45	ng/L		08/18/22 21:44	1
Perfluorohexanesulfonic acid	0.87	J	1.8	1.3	0.45	ng/L		08/18/22 21:44	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
NEtFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
NMeFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
HFPODA	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
9CI-PF3ONS	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
DONA	<1.3		1.8	1.3	0.45	ng/L		08/18/22 21:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	88		70 - 130				08/11/22 16:19	08/18/22 21:44	1
13C2 PFHxA	98		70 - 130				08/11/22 16:19	08/18/22 21:44	1
13C3 HFPO-DA	94		70 - 130				08/11/22 16:19	08/18/22 21:44	1
d5-NEtFOSAA	93		70 - 130				08/11/22 16:19	08/18/22 21:44	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93076-1

Client Sample ID: YTC-OFFP-229-DW-072922

Lab Sample ID: 410-93076-9

Date Collected: 07/29/22 12:49

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/18/22 21:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	96		70 - 130	08/11/22 16:19	08/18/22 21:55	1
13C2 PFHxA	94		70 - 130	08/11/22 16:19	08/18/22 21:55	1
13C3 HFPO-DA	91		70 - 130	08/11/22 16:19	08/18/22 21:55	1
d5-NEtFOSAA	88		70 - 130	08/11/22 16:19	08/18/22 21:55	1

Client Sample ID: YTC-OFFP-221-DW-072922

Lab Sample ID: 410-93076-10

Date Collected: 07/29/22 13:02

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
Perfluorobutanesulfonic acid	0.63	J	1.8	1.3	0.44	ng/L		08/18/22 22:07	1
Perfluorohexanesulfonic acid	2.1		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/18/22 22:07	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93076-1

Client Sample ID: YTC-OFFP-221-DW-072922

Lab Sample ID: 410-93076-10

Date Collected: 07/29/22 13:02

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	90		70 - 130	08/11/22 16:19	08/18/22 22:07	1
13C2 PFHxA	94		70 - 130	08/11/22 16:19	08/18/22 22:07	1
13C3 HFPO-DA	91		70 - 130	08/11/22 16:19	08/18/22 22:07	1
d5-NEtFOSAA	78		70 - 130	08/11/22 16:19	08/18/22 22:07	1

Client Sample ID: YTC-OFFP-191-DW-072922

Lab Sample ID: 410-93076-11

Date Collected: 07/29/22 09:03

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
Perfluorobutanesulfonic acid	0.51	J	1.8	1.3	0.45	ng/L		08/18/22 22:19	1
Perfluorohexanesulfonic acid	0.47	J	1.8	1.3	0.45	ng/L		08/18/22 22:19	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
NEtFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
NMeFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
HFPODA	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
9Cl-PF3ONS	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
11Cl-PF3OUdS	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1
DONA	<1.3		1.8	1.3	0.45	ng/L		08/18/22 22:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130	08/11/22 16:19	08/18/22 22:19	1
13C2 PFHxA	98		70 - 130	08/11/22 16:19	08/18/22 22:19	1
13C3 HFPO-DA	92		70 - 130	08/11/22 16:19	08/18/22 22:19	1
d5-NEtFOSAA	85		70 - 130	08/11/22 16:19	08/18/22 22:19	1

Client Sample ID: YTC-OFFP-197-DW-072922

Lab Sample ID: 410-93076-12

Date Collected: 07/29/22 10:28

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.1	J	1.7	1.3	0.43	ng/L		08/18/22 22:30	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:30	1
Perfluorooctanoic acid	0.62	J	1.7	1.3	0.43	ng/L		08/18/22 22:30	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:30	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:30	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:30	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:30	1
Perfluorobutanesulfonic acid	0.56	J	1.7	1.3	0.43	ng/L		08/18/22 22:30	1
Perfluorohexanesulfonic acid	2.5		1.7	1.3	0.43	ng/L		08/18/22 22:30	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93076-1

Client Sample ID: YTC-OFFP-197-DW-072922

Lab Sample ID: 410-93076-12

Date Collected: 07/29/22 10:28

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	0.45	J	1.7	1.3	0.43	ng/L		08/18/22 22:30	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:30	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:30	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:30	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:30	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:30	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:30	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:30	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130				08/11/22 16:19	08/18/22 22:30	1
13C2 PFHxA	97		70 - 130				08/11/22 16:19	08/18/22 22:30	1
13C3 HFPO-DA	95		70 - 130				08/11/22 16:19	08/18/22 22:30	1
d5-NEtFOSAA	90		70 - 130				08/11/22 16:19	08/18/22 22:30	1

Client Sample ID: YTC-OFFP-190-DW-072922

Lab Sample ID: 410-93076-13

Date Collected: 07/29/22 09:16

Matrix: Drinking Water

Date Received: 08/02/22 10:26

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
Perfluorobutanesulfonic acid	1.1	J	1.7	1.3	0.43	ng/L		08/18/22 22:42	1
Perfluorohexanesulfonic acid	2.5		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/18/22 22:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	98		70 - 130				08/11/22 16:19	08/18/22 22:42	1
13C2 PFHxA	99		70 - 130				08/11/22 16:19	08/18/22 22:42	1
13C3 HFPO-DA	94		70 - 130				08/11/22 16:19	08/18/22 22:42	1
d5-NEtFOSAA	85		70 - 130				08/11/22 16:19	08/18/22 22:42	1

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #410-93082-1

Analyses Performed By:

Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report #46660R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93082-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-160-DW-080122	410-93082-1	Water	8/1/2022		X
YTC-OFFP-219-DW-080122	410-93082-2	Water	8/1/2022		X
YTC-OFFP-222-DW-080122	410-93082-3	Water	8/1/2022		X
YTC-OFFP-223-DW-080122	410-93082-4	Water	8/1/2022		X
YTC-OFFP-225-DW-080122	410-93082-5	Water	8/1/2022		X
YTC-OFFP-228-DW-080122	410-93082-6	Water	8/1/2022		X
YTC-OFFP-231-DW-080122	410-93082-7	Water	8/1/2022		X
YTC-OFFP-235-DW-080122	410-93082-8	Water	8/1/2022		X
YTC-OFFP-280-DW-080122	410-93082-9	Water	8/1/2022		X
YTC-OFFP-292-DW-080122	410-93082-10	Water	8/1/2022		X
YTC-OFFP-302-DW-080122	410-93082-11	Water	8/1/2022		X
YTC-OFFP-303-DW-080122	410-93082-12	Water	8/1/2022		X
YTC-OFFP-FD-10-DW-080122	410-93082-13	Water	8/1/2022	YTC-OFFP-302-DW-080122	X
YTC-OFFP-FD-06-DW-080122	410-93082-14	Water	8/1/2022	YTC-OFFP-223-DW-080122	X
YTC-OFFP-317-DW-073022	410-93082-15	Water	7/30/2022		X
YTC-OFFP-210-DW-073022	410-93082-16	Water	7/30/2022		X

Note:

1. Stage 3/4 validation was performed on sample locations YTC-OFFP-292-DW-080122 and YTC-OFFP-302-DW-080122.
2. The MS/MSD analysis was performed on samples YTC-OFFP-223-DW-080122 and YTC-OFFP-302-DW-080122.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X	X		
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

The containers for the following sample were unlabeled; however, the sample was able to be identified by sample IDs written on bags that the containers were received in: YTC-OFFP-FD-06-DW-080122 (410-93082-14).

A field reagent blank was not submitted with the samples within this SDG as required by USEPA method 537.

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Yakima, Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers

- U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

- J The reported result was an estimated value with an unknown bias.
- J+ The result was an estimated quantity, but the result may be biased high.
- J- The result was an estimated quantity, but the result may be biased low.
- UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
- UB Compound considered non-detect at the listed value due to associated blank contamination.
- R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
- X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance was acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

DATA REVIEW REPORT

Sample Locations	Initial/Continuing	Compound	Criteria
YTC-OFFP-FD-06-DW-080122	CCV %D	Perfluoroheptanoic acid	130.5%
		HFPODA	130.6%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
ICAL Standards Initial Calibration Verification	%R >130% (increase in sensitivity)	Non-detect	No Action
		Detect	J+
Continuing Calibration	%R <70% (decrease in sensitivity)	Non-detect	UJ
		Detect	J-
ICAL Standards Initial Calibration Verification Continuing Calibration	%R <50% or >150%	Non-detect	X or R
		Detect	X or R

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in EPA method 537 version 2.0 Table 4.

The ion transitions were as specified in EPA method 537 version 2.0 Table 4.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

DATA REVIEW REPORT

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analyses performed on samples YTC-OFFP-223-DW-080122 and YTC-OFFP-302-DW-080122 exhibited recoveries and RPDs within control limits.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

Sample locations associated with the LCS exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	LCS Recovery
YTC-OFFP-280-DW-080122 YTC-OFFP-292-DW-080122	Perfluorooctanoic acid	<70% but >10%
	Perfluorononanoic acid	<70% but >10%
	Perfluorodecanoic acid	<70% but >10%
	Perfluorooctanesulfonic acid	<70% but >10%
	NMeFOSAA	<70% but >10%

The criteria used to evaluate the LCS recoveries are presented in the following table. In the case of an LCS deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 130%	Non-detect	No Action
	Detect	J+
< 70% but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	X or R
	Detect	

The samples were re-extracted and reanalyzed outside holding time. Since the LCS recoveries were only marginally below control limits and the reanalysis exhibited similar detected results, the primary analysis will be reported and qualified as shown in the table above.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field

DATA REVIEW REPORT

duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
YTC-OFFP-223-DW-080122/ YTC-OFFP-FD-06-DW-080122	Perfluorohexanoic acid	1.4 U	0.43 J	AC
YTC-OFFP-302-DW-080122/ YTC-OFFP-FD-10-DW-080122	Perfluorohexanoic acid	35	35	0.0%
	Perfluoroheptanoic acid	12	12	0.0%
	Perfluorooctanoic acid	14	14	0.0%
	Perfluorononanoic acid	0.54 J	0.54 J	AC
	Perfluorohexanesulfonic acid	80	82	2.5%
	Perfluorooctanesulfonic acid	71	72	1.4%
	Perfluorobutanesulfonic acid	15	16	6.5%

Notes:

AC Acceptable

The calculated RPD and/or results between the parent samples and their associated field duplicate were acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-292-DW-080122	Perfluorohexanesulfonic acid	--	180	180 D
	Perfluorooctanesulfonic acid	--	130	130 D
YTC-OFFP-302-DW-080122	Perfluorohexanesulfonic acid	--	80	80 D
	Perfluorooctanesulfonic acid	--	71	71 D
YTC-OFFP-FD-10-DW-080122	Perfluorohexanesulfonic acid	--	82	82 D
	Perfluorooctanesulfonic acid	--	72	72 D

Note: The laboratory did not report the original analysis, only the diluted result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

DATA REVIEW REPORT

Reported Sample Results	Qualification
Diluted sample result within calibration range.	D

Note a number of results were manually integrated which were spot checked. The manual quantitation (M) laboratory qualifier has been preserved with the data as informational data for the end user; there was no impact on the data usability.

10. System Performance and Overall Assessment

The case narrative noted the lack of a field reagent blank. The associated sample results are not affected. Hence the "cn" qualifier can be ignored since the qualifiers impact to the data has been accessed and the qualifier has been removed in the database.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field reagent blanks	X				
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate Standard %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Stage 3/4 Validation					
System performance check		X		X	
Initial calibration %RSD/%R		X		X	
Continuing calibration %R/%D		X	X		
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculations acceptable		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

- %RSD Relative standard deviation
- %R Percent recovery
- RPD Relative percent difference
- %D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Andrew Korycinski, Arcadis

SIGNATURE:



DATE: September 1, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: September 1, 2022

Tier 3
PFAS Calibration Standards %D

SDG #: J93082
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 9/1/2022
 Page: 1
 Validated by: AJK

Method: EPA Method 537.1, Version 2.0

PFOS, 08/18/2022 Calibration

Instrument 30730

Page: 372

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	117760	6168067	28.68	0.019092	1.182624	1.225	0.4470	0.463	-3.459	-3.4	MATCH
0.926	238853	6384289	28.68	0.037413	1.158741	1.225	0.8759	0.926	-5.409	-5.3	MATCH
2.31	683559	6468718	28.68	0.105671	1.311973	1.225	2.4740	2.31	7.100	7.0	MATCH
4.63	1281742	6362369	28.68	0.201457	1.2479	1.225	4.7166	4.63	1.869	2.0	MATCH
18.5	4969754	6351699	28.68	0.782429	1.212977	1.225	18.3184	18.5	-0.982	-1.0	MATCH
Avg RF					1.222843	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: J93082
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 9/1/2022
 Page: 2
 Validated by: AJK

Method: EPA Method 537.1, Version 2.0

ICV 410-287447/8 8/18/2022 18:22 Instrument 30730 Page: 355

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	815284	6291294	28.68	0.129589	1.599	2.32434	2.21	5.17	5.1	Match
PFOS	589830	6291294	28.68	0.093753	1.225	2.194977	2.39	-8.16	-8.1	Match
PFOA	1456469	5367868	10	0.271331	1.053	2.576743	2.5	3.07	3.1	Match

CCVLIS 410-287534/1 8/18/2022 18:22 PM Instrument 30730 Page 641

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	149030	6211591	28.68	0.023992	1.599	0.43033	0.443	-2.86	-2.8	Match
PFOS	118873	6211591	28.68	0.019137	1.225	0.44805	0.463	-3.23	-3.1	Match
PFOA	273294	5268996	10	0.051868	1.053	0.49258	0.5	-1.48	-1.5	Match

CCVIS 410-288829/11 8/23/2022 20:30 Instrument 30730 Page 715

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	978036	7076458	28.68	0.13821	1.613	2.45744	2.21	11.20	11.1	Match
PFOS	756820	7076458	28.68	0.106949	1.232	2.48969	2.31	7.78	7.6	Match
PFOA	1753623	5459653	10	0.321197	1.147	2.80032	2.5	12.01	12	Match

Concentration ng/ml = (Peak area ratio/slope) x IS concentration

Tier 3
PFAS LCS

SDG #: J93082
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 9/1/2022
Page: 3
Validated by: AJK

Method: EPA Method 537.1, Version 2.0

LCS ID LCS 410-285182/2-A
ANALYTE PFOA
REPORTED LCS %R 96
REPORTED LCSD %R _____
REPORTED RPD _____

Page 124 (824 raw data)

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration 19.6
LCSD Concentration _____
LCS TV 20.5
LCSD TV _____

LCS %R 95.61 MATCH
LCSD %R _____
RPD _____

%R may be different than reported due to rounding of the true value

Tier 3
PFAS MS/MSD

SDG #: J93082
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 9/1/2022
Page: 4
Validated by: AJK

Method: EPA Method 537.1, Version 2.0

MS/MSD Sample ID YTC-OFFP-302-DW-080122

Page 129 and 131

ANALYTE PFOA
REPORTED MS %R 88
REPORTED MSD %R 86
REPORTED RPD 3

$$\%R = \frac{100 * \text{MS Concentration}}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * | \text{MS \%R} - \text{MSD \%R} |}{\text{Average of MS MSD \%R}}$$

Sample Concentration 14
MS Concentration 29.5
MSD Concentration 30.3
MS TV 17.3
MSD TV 18.7

MS %R 89.60 MATCH
MSD %R 87.17 MATCH
RPD 2.68 MATCH

Differences in %R may be due to rounded values from the MS/MSD Form III used to calculate the recoveries

Tier 3
PFAS Sample Concentration

SDG #: J93082
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 9/1/2022
 Page: 5
 Validated by: AJK

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-292-DW-080122 Lab ID: 410-93082-10 Page 222
 Instrument: 30730 8/18/2022 20:55 DL 8/25/2022 12:27

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFBS	2175584	6639134	28.68	0.327691	1.599	5.88	1	275	21.37	21
PFOS 10X	1149027	7251769	28.68	0.158448	1.225	3.71	1	275	134.90	130
PFOA	2800343	5785501	10	0.484028	1.053	4.60	1	275	16.72	17

Match
Match
Match

Sample ID: YTC-OFFP-302-DW-080122 Lab ID: 410-93082-11 Page 245
 Instrument: 30730 8/23/2022 22:30 DL 8/23/2022 19:20

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFBS	1806931	7415893	28.68	0.243657	1.613	4.33	1	281.4	15.40	15
PFOS	660441	7725633	28.68	0.085487	1.232	1.99	1	281.4	70.72	71
PFOA	2810532	6112959	10	0.459766	1.147	4.01	1	281.4	14.24	14

Match
Match
Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: J93082
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 9/1/2022
Page: 6
Validated by: AJK

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-292-DW-080122 Lab ID: 410-93082-10 Page 222

Surrogate 13C2 PFDA
REPORTED %R 103

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 10.3
Surrogate TV 10.0
%R 103.0 MATCH

Sample ID: YTC-OFFP-302-DW-080122 Lab ID: 410-93082-11 Page 245

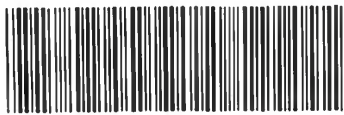
Surrogate 13C2 PFHxA
REPORTED %R 94

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 9.42
Surrogate TV 10.0
%R 94.2 MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS





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Chain of Custody Record



Environment Testing
America

410-93082 Chain of Custody

Client Contact Andrew Kopchynski		Sampler: Andrew Kopchynski		Lab PM Gordon, Stephen J		Carrier Tracking No(s)		COC No: 410-61650-17570 19			
Company Seres Engineering & Services LLC		Phone: (631) 316-4206		E-Mail: Stephen.Gordon@et.eurofinsus.com		State of Origin: WA		Page: 1 of 28			
Address 669 Marina Drive Suite B7		Due Date Requested:		Analysis Requested		Job #: 30059933		Preservation Codes:			
City Charleston		TAT Requested (days): Normal		537.1_DW - DW EPA 537.1 List of 18 537.1_DW - DW EPA 537.1 List of 18 537.1_DW - DW EPA 537.1 List of 18		A - HCL		M - Hexane			
State, Zip SC, 29492		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No				B - NaOH		N - None		O - AsNaO2	
Phone 720-344-3712(Tel)		PO #: D18-218 PFAS PA/SI				C - Zn Acetate		P - Na2O4S		Q - Na2SO3	
Email afkopchynski@seres-es.com		WO #: 3005993 YTC00				D - Nitric Acid		R - Na2S2O3		S - H2SO4	
Project Name: Yakima Training Center (YTC)		Project #: 41011531		E - NaHSO4		T - TSP Dodecahydrate		U - Acetone			
Site: _____		SSOW#:		F - MeOH		V - MCAA		W - pH 4-5			
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)			
YTC-OFFP- 160-DW-080122		08/01/22		0913		G		Drinking Water			
YTC-OFFP- 219-DW-080122		08/01/22		0928		G		Drinking Water			
YTC-OFFP- 222-DW-080122		08/01/22		0942				Drinking Water			
YTC-OFFP- 223-DW-080122		08/01/22		1004		G		Drinking Water			
YTC-OFFP- 225-DW-080122		08/01/22		1036		G		Drinking Water			
YTC-OFFP- 228-DW-080122		08/01/22		1050		G		Drinking Water			
YTC-OFFP- 231-DW-080122		08/01/22		1238		G		Drinking Water			
YTC-OFFP- 235-DW-080122		08/01/22		1105		G		Drinking Water			
YTC-OFFP- 280-DW-080122		08/01/22		1130		G		Drinking Water			
YTC-OFFP- 292-DW-080122		08/01/22		1256		G		Drinking Water			
YTC-OFFP- 302-DW-080122		08/01/22		1324		G		Drinking Water			
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)						
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months						
Deliverable Requested: I, II, III, IV, Other (specify)					Special Instructions/QC Requirements:						
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:					
Relinquished by: Ben M...		Date/Time: 08/01/22 1455		Company: Seres		Received by:		Date/Time:			
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:			
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time: 8/2/22 10:29 Company: ELLET			
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 0.9							

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Chain of Custody Record

Client Information		Sampler: <u>Andrew Kopchynski</u>		Lab PM: Gordon, Stephen J		Camer Tracking No(s):		COC No: 410-61650-17570.18	
Client Contact: Andrew Kopchynski		Phone: <u>(631) 316-4206</u>		E-Mail: Stephen.Gordon@et.eurofinsus.com		State of Origin: <u>WA</u>		Page: <u>2</u> of <u>2</u> Page <u>18</u> of <u>28</u>	
Company: Seres Engineering & Services LLC				PWSID:		Analysis Requested			
Address: 669 Marina Drive Suite B7		Due Date Requested:		537.1_DW - DW EPA 537.1 List of 18 Total Number of containers		Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Y - Trizma Z - other (specify)			
City: Charleston		TAT Requested (days): <u>Normal</u>							
State, Zip: SC, 29492		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No							
Phone: 720-344-3712(Tel)		PO #: D18-218 PFAS PA/SI							
Email: afkopchynski@seres-es.com		WO #: 3005993.YTC00							
Project Name: Yakima Training Center (YTC)		Project #: 41011531		SSOV#:		Job #: <u>3005993 30059933</u>			
Site: <u>✓</u>						Other:			
Sample Identification		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=soil, BT=Tissue, A=Air)	Special Instructions/Note:			
YTC-OFFP- <u>303-DW-080122</u>		<u>08/01/22</u>	<u>1351</u>	<u>G</u>	<u>Drinking Water</u>	<u>N</u>	<u>N</u>	<u>2</u>	
YTC-OFFP- <u>FD-10-DW-080122</u>		<u>08/01/22</u>	<u>1200</u>	<u>G</u>	<u>Drinking Water</u>	<u>N</u>	<u>N</u>	<u>2</u>	
YTC-OFFP- <u>FD-06-DW-080122</u>		<u>08/01/22</u>	<u>1200</u>	<u>G</u>	<u>Drinking Water</u>	<u>N</u>	<u>N</u>	<u>2</u>	
YTC-OFFP- <u>317-DW-073022</u>		<u>07/30/22</u>	<u>0851</u>	<u>G</u>	<u>Drinking Water</u>	<u>N</u>	<u>N</u>	<u>2</u>	
YTC-OFFP- <u>210-DW-073022</u>		<u>07/30/22</u>	<u>0907</u>	<u>G</u>	<u>Drinking Water</u>	<u>N</u>	<u>N</u>	<u>2</u>	
YTC-OFFP-					<u>Drinking Water</u>				
YTC-OFFP-					<u>Drinking Water</u>				
YTC-OFFP-					<u>Drinking Water</u>				
YTC-OFFP-					<u>Drinking Water</u>				
YTC-OFFP-					<u>Drinking Water</u>				
YTC-OFFP-					<u>Drinking Water</u>				
Possible Hazard Identification		<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological				Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:							
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:			
Relinquished by: <u>Tom Medding</u>		Date/Time: <u>08/01/22 1455</u>		Company: <u>Seres</u>		Received by: _____		Date/Time: _____	
Relinquished by: _____		Date/Time: _____		Company: _____		Received by: _____		Date/Time: _____	
Relinquished by: _____		Date/Time: _____		Company: _____		Received by: _____		Date/Time: <u>8/2/22 10:24</u>	
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: <u>0.9</u>					

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93082-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*-	LCS and/or LCSD is outside acceptance limits, low biased.
^c	CCV Recovery is outside acceptance limits.
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.
cn	Refer to Case Narrative for further detail
D	The reported value is from a dilution.
E	Result exceeded calibration range.
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
M	Manual integrated compound.

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
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
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

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93082-1

Client Sample ID: YTC-OFFP-160-DW-080122

Lab Sample ID: 410-93082-1

Date Collected: 08/01/22 09:13

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
9CI-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
11CI-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 07:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101	cn	70 - 130	08/11/22 14:49	08/24/22 07:21	1
13C2 PFHxA	99	cn	70 - 130	08/11/22 14:49	08/24/22 07:21	1
13C3 HFPO-DA	97	cn	70 - 130	08/11/22 14:49	08/24/22 07:21	1
d5-NEtFOSAA	101	cn	70 - 130	08/11/22 14:49	08/24/22 07:21	1

Client Sample ID: YTC-OFFP-219-DW-080122

Lab Sample ID: 410-93082-2

Date Collected: 08/01/22 09:28

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	0.50	J cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
Perfluoroheptanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
Perfluorooctanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
Perfluorononanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
Perfluorodecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
Perfluorotridecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
Perfluorotetradecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
Perfluorobutanesulfonic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
Perfluorohexanesulfonic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
Perfluorooctanesulfonic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
NEtFOSAA	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
NMeFOSAA	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
Perfluoroundecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
Perfluorododecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
HFPODA	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
9CI-PF3ONS	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
11CI-PF3OUdS	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1
DONA	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:32	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93082-1

Client Sample ID: YTC-OFFP-219-DW-080122

Lab Sample ID: 410-93082-2

Date Collected: 08/01/22 09:28

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	107	cn	70 - 130	08/11/22 14:49	08/24/22 07:32	1
13C2 PFHxA	103	cn	70 - 130	08/11/22 14:49	08/24/22 07:32	1
13C3 HFPO-DA	100	cn	70 - 130	08/11/22 14:49	08/24/22 07:32	1
d5-NEtFOSAA	90	cn	70 - 130	08/11/22 14:49	08/24/22 07:32	1

Client Sample ID: YTC-OFFP-222-DW-080122

Lab Sample ID: 410-93082-3

Date Collected: 08/01/22 09:42

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
Perfluoroheptanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
Perfluorooctanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
Perfluorononanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
Perfluorodecanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
Perfluorotridecanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
Perfluorotetradecanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
Perfluorobutanesulfonic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
Perfluorohexanesulfonic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
Perfluorooctanesulfonic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
NEtFOSAA	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
NMeFOSAA	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
Perfluoroundecanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
Perfluorododecanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
HFPODA	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
9Cl-PF3ONS	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
11Cl-PF3OUdS	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1
DONA	<1.4	cn	1.8	1.4	0.46	ng/L		08/24/22 07:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101	cn	70 - 130	08/11/22 14:49	08/24/22 07:44	1
13C2 PFHxA	97	cn	70 - 130	08/11/22 14:49	08/24/22 07:44	1
13C3 HFPO-DA	92	cn	70 - 130	08/11/22 14:49	08/24/22 07:44	1
d5-NEtFOSAA	91	cn	70 - 130	08/11/22 14:49	08/24/22 07:44	1

Client Sample ID: YTC-OFFP-223-DW-080122

Lab Sample ID: 410-93082-4

Date Collected: 08/01/22 10:04

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
Perfluoroheptanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
Perfluorooctanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
Perfluorononanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
Perfluorodecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
Perfluorotridecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
Perfluorotetradecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
Perfluorobutanesulfonic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
Perfluorohexanesulfonic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93082-1

Client Sample ID: YTC-OFFP-223-DW-080122

Lab Sample ID: 410-93082-4

Date Collected: 08/01/22 10:04

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
NEtFOSAA	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
NMeFOSAA	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
Perfluoroundecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
Perfluorododecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
HFPODA	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
9CI-PF3ONS	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
11CI-PF3OUdS	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
DONA	<1.4	cn	1.8	1.4	0.45	ng/L		08/24/22 07:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	104	cn	70 - 130				08/11/22 14:49	08/24/22 07:56	1
13C2 PFHxA	102	cn	70 - 130				08/11/22 14:49	08/24/22 07:56	1
13C3 HFPO-DA	95	cn	70 - 130				08/11/22 14:49	08/24/22 07:56	1
d5-NEtFOSAA	101	cn	70 - 130				08/11/22 14:49	08/24/22 07:56	1

Client Sample ID: YTC-OFFP-225-DW-080122

Lab Sample ID: 410-93082-5

Date Collected: 08/01/22 10:36

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	2.7	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
Perfluoroheptanoic acid	0.62	J cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
Perfluorooctanoic acid	0.77	J M cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
9CI-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
11CI-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/24/22 08:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	102	cn	70 - 130				08/11/22 14:49	08/24/22 08:42	1
13C2 PFHxA	98	cn	70 - 130				08/11/22 14:49	08/24/22 08:42	1
13C3 HFPO-DA	95	cn	70 - 130				08/11/22 14:49	08/24/22 08:42	1
d5-NEtFOSAA	91	cn	70 - 130				08/11/22 14:49	08/24/22 08:42	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93082-1

Client Sample ID: YTC-OFFP-228-DW-080122

Lab Sample ID: 410-93082-6

Date Collected: 08/01/22 10:50

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
Perfluoroheptanoic acid	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
Perfluorooctanoic acid	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
Perfluorononanoic acid	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
Perfluorodecanoic acid	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
Perfluorotridecanoic acid	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
Perfluorotetradecanoic acid	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
Perfluorobutanesulfonic acid	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
Perfluorohexanesulfonic acid	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
Perfluorooctanesulfonic acid	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
NEtFOSAA	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
NMeFOSAA	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
Perfluoroundecanoic acid	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
Perfluorododecanoic acid	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
HFPODA	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
9CI-PF3ONS	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
11CI-PF3OUdS	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1
DONA	<1.4	cn	1.9	1.4	0.47	ng/L		08/24/22 08:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101	cn	70 - 130	08/11/22 14:49	08/24/22 08:53	1
13C2 PFHxA	100	cn	70 - 130	08/11/22 14:49	08/24/22 08:53	1
13C3 HFPO-DA	97	cn	70 - 130	08/11/22 14:49	08/24/22 08:53	1
d5-NEtFOSAA	96	cn	70 - 130	08/11/22 14:49	08/24/22 08:53	1

Client Sample ID: YTC-OFFP-231-DW-080122

Lab Sample ID: 410-93082-7

Date Collected: 08/01/22 12:38

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	0.46	J cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
Perfluoroheptanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
Perfluorooctanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
Perfluorononanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
Perfluorobutanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
Perfluorohexanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
Perfluorooctanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
HFPODA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
9CI-PF3ONS	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
11CI-PF3OUdS	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1
DONA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:05	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93082-1

Client Sample ID: YTC-OFFP-231-DW-080122

Lab Sample ID: 410-93082-7

Date Collected: 08/01/22 12:38

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103	cn	70 - 130	08/11/22 14:49	08/24/22 09:05	1
13C2 PFHxA	103	cn	70 - 130	08/11/22 14:49	08/24/22 09:05	1
13C3 HFPO-DA	98	cn	70 - 130	08/11/22 14:49	08/24/22 09:05	1
d5-NEtFOSAA	100	cn	70 - 130	08/11/22 14:49	08/24/22 09:05	1

Client Sample ID: YTC-OFFP-235-DW-080122

Lab Sample ID: 410-93082-8

Date Collected: 08/01/22 11:05

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
Perfluoroheptanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
Perfluorooctanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
Perfluorononanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
Perfluorobutanesulfonic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
Perfluorohexanesulfonic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
Perfluorooctanesulfonic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
HFPODA	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
9CI-PF3ONS	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
11CI-PF3OUdS	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1
DONA	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 09:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101	cn	70 - 130	08/11/22 14:49	08/24/22 09:16	1
13C2 PFHxA	97	cn	70 - 130	08/11/22 14:49	08/24/22 09:16	1
13C3 HFPO-DA	92	cn	70 - 130	08/11/22 14:49	08/24/22 09:16	1
d5-NEtFOSAA	93	cn	70 - 130	08/11/22 14:49	08/24/22 09:16	1

Client Sample ID: YTC-OFFP-280-DW-080122

Lab Sample ID: 410-93082-9

Date Collected: 08/01/22 11:30

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	2.9		1.9	1.4	0.46	ng/L		08/18/22 20:42	1
Perfluoroheptanoic acid	1.4	J	1.9	1.4	0.46	ng/L		08/18/22 20:42	1
Perfluorooctanoic acid	2.9	*-M-cn MJ-	1.9	1.4	0.46	ng/L		08/18/22 20:42	1
Perfluorononanoic acid	<1.4	*-cn UJ	1.9	1.4	0.46	ng/L		08/18/22 20:42	1
Perfluorodecanoic acid	<1.4	*-cn UJ	1.9	1.4	0.46	ng/L		08/18/22 20:42	1
Perfluorotridecanoic acid	<1.4		1.9	1.4	0.46	ng/L		08/18/22 20:42	1
Perfluorotetradecanoic acid	<1.4		1.9	1.4	0.46	ng/L		08/18/22 20:42	1
Perfluorobutanesulfonic acid	6.0		1.9	1.4	0.46	ng/L		08/18/22 20:42	1
Perfluorohexanesulfonic acid	31		1.9	1.4	0.46	ng/L		08/18/22 20:42	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93082-1

Client Sample ID: YTC-OFFP-280-DW-080122

Lab Sample ID: 410-93082-9

Date Collected: 08/01/22 11:30

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	14	cn J-	1.9	1.4	0.46	ng/L		08/18/22 20:42	1
NEtFOSAA	<1.4		1.9	1.4	0.46	ng/L		08/18/22 20:42	1
NMeFOSAA	<1.4	cn UJ	1.9	1.4	0.46	ng/L		08/18/22 20:42	1
Perfluoroundecanoic acid	<1.4		1.9	1.4	0.46	ng/L		08/18/22 20:42	1
Perfluorododecanoic acid	<1.4		1.9	1.4	0.46	ng/L		08/18/22 20:42	1
HFPODA	<1.4		1.9	1.4	0.46	ng/L		08/18/22 20:42	1
9Cl-PF3ONS	<1.4		1.9	1.4	0.46	ng/L		08/18/22 20:42	1
11Cl-PF3OUdS	<1.4		1.9	1.4	0.46	ng/L		08/18/22 20:42	1
DONA	<1.4		1.9	1.4	0.46	ng/L		08/18/22 20:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	96		70 - 130				08/15/22 09:51	08/18/22 20:42	1
13C2 PFHxA	92		70 - 130				08/15/22 09:51	08/18/22 20:42	1
13C3 HFPO-DA	90		70 - 130				08/15/22 09:51	08/18/22 20:42	1
d5-NEtFOSAA	90		70 - 130				08/15/22 09:51	08/18/22 20:42	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	3.2	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
Perfluoroheptanoic acid	1.6	J H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
Perfluorooctanoic acid	3.3	H M	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
Perfluorononanoic acid	<1.4	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
Perfluorodecanoic acid	<1.4	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
Perfluorotridecanoic acid	<1.4	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
Perfluorotetradecanoic acid	<1.4	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
Perfluorobutanesulfonic acid	6.6	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
Perfluorohexanesulfonic acid	33	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
Perfluorooctanesulfonic acid	15	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
NEtFOSAA	<1.4	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
NMeFOSAA	<1.4	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
Perfluoroundecanoic acid	<1.4	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
Perfluorododecanoic acid	<1.4	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
HFPODA	<1.4	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
9Cl-PF3ONS	<1.4	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
11Cl-PF3OUdS	<1.4	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
DONA	<1.4	H	1.8	1.4	0.46	ng/L		08/24/22 22:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	107		70 - 130				08/23/22 13:34	08/24/22 22:24	1
13C2 PFHxA	105		70 - 130				08/23/22 13:34	08/24/22 22:24	1
13C3 HFPO-DA	100		70 - 130				08/23/22 13:34	08/24/22 22:24	1
d5-NEtFOSAA	100		70 - 130				08/23/22 13:34	08/24/22 22:24	1

Client Sample ID: YTC-OFFP-292-DW-080122

Lab Sample ID: 410-93082-10

Date Collected: 08/01/22 12:56

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	26		1.8	1.4	0.45	ng/L		08/18/22 20:55	1
Perfluoroheptanoic acid	11		1.8	1.4	0.45	ng/L		08/18/22 20:55	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93082-1

Client Sample ID: YTC-OFFP-292-DW-080122

Lab Sample ID: 410-93082-10

Date Collected: 08/01/22 12:56

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanoic acid	17	M cn MJ-	1.8	1.4	0.45	ng/L		08/18/22 20:55	1
Perfluorononanoic acid	1.6	J * cn J-	1.8	1.4	0.45	ng/L		08/18/22 20:55	1
Perfluorodecanoic acid	<1.4	cn UJ	1.8	1.4	0.45	ng/L		08/18/22 20:55	1
Perfluorotridecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 20:55	1
Perfluorotetradecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 20:55	1
Perfluorobutanesulfonic acid	21		1.8	1.4	0.45	ng/L		08/18/22 20:55	1
NEtFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/18/22 20:55	1
NMeFOSAA	<1.4	cn UJ	1.8	1.4	0.45	ng/L		08/18/22 20:55	1
Perfluoroundecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 20:55	1
Perfluorododecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/18/22 20:55	1
HFPODA	<1.4		1.8	1.4	0.45	ng/L		08/18/22 20:55	1
9CI-PF3ONS	<1.4		1.8	1.4	0.45	ng/L		08/18/22 20:55	1
11CI-PF3OUdS	<1.4		1.8	1.4	0.45	ng/L		08/18/22 20:55	1
DONA	<1.4		1.8	1.4	0.45	ng/L		08/18/22 20:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103		70 - 130	08/15/22 09:51	08/18/22 20:55	1
13C2 PFHxA	100		70 - 130	08/15/22 09:51	08/18/22 20:55	1
13C3 HFPO-DA	101		70 - 130	08/15/22 09:51	08/18/22 20:55	1
d5-NEtFOSAA	93		70 - 130	08/15/22 09:51	08/18/22 20:55	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	180	D	18	14	4.5	ng/L		08/25/22 12:27	10
Perfluorooctanesulfonic acid	130	D cn DJ-	18	14	4.5	ng/L		08/25/22 12:27	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	117		70 - 130	08/15/22 09:51	08/25/22 12:27	10
13C2 PFHxA	109		70 - 130	08/15/22 09:51	08/25/22 12:27	10
13C3 HFPO-DA	102		70 - 130	08/15/22 09:51	08/25/22 12:27	10
d5-NEtFOSAA	112		70 - 130	08/15/22 09:51	08/25/22 12:27	10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	27	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
Perfluoroheptanoic acid	12	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
Perfluorooctanoic acid	17	H M	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
Perfluorononanoic acid	1.7	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
Perfluorobutanesulfonic acid	22	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
Perfluorohexanesulfonic acid	180	H E	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
Perfluorooctanesulfonic acid	140	H E	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
NEtFOSAA	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
NMeFOSAA	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
HFPODA	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
9CI-PF3ONS	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93082-1

Client Sample ID: YTC-OFFP-292-DW-080122

Lab Sample ID: 410-93082-10

Date Collected: 08/01/22 12:56

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
11CI-PF3OUdS	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1
DONA	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 22:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130	08/23/22 13:34	08/24/22 22:36	1
13C2 PFHxA	104		70 - 130	08/23/22 13:34	08/24/22 22:36	1
13C3 HFPO-DA	102		70 - 130	08/23/22 13:34	08/24/22 22:36	1
d5-NEtFOSAA	96		70 - 130	08/23/22 13:34	08/24/22 22:36	1

Client Sample ID: YTC-OFFP-302-DW-080122

Lab Sample ID: 410-93082-11

Date Collected: 08/01/22 13:24

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	35		1.8	1.3	0.44	ng/L		08/23/22 19:09	1
Perfluoroheptanoic acid	12		1.8	1.3	0.44	ng/L		08/23/22 19:09	1
Perfluorooctanoic acid	14	M	1.8	1.3	0.44	ng/L		08/23/22 19:09	1
Perfluorononanoic acid	0.54	J	1.8	1.3	0.44	ng/L		08/23/22 19:09	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 19:09	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 19:09	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 19:09	1
Perfluorobutanesulfonic acid	15		1.8	1.3	0.44	ng/L		08/23/22 19:09	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/23/22 19:09	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/23/22 19:09	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 19:09	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 19:09	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/23/22 19:09	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/23/22 19:09	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/23/22 19:09	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/23/22 19:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	104		70 - 130	08/15/22 11:01	08/23/22 19:09	1
13C2 PFHxA	94		70 - 130	08/15/22 11:01	08/23/22 19:09	1
13C3 HFPO-DA	93		70 - 130	08/15/22 11:01	08/23/22 19:09	1
d5-NEtFOSAA	99		70 - 130	08/15/22 11:01	08/23/22 19:09	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	80	D	18	13	4.4	ng/L		08/23/22 19:20	10
Perfluorooctanesulfonic acid	71	D M	18	13	4.4	ng/L		08/23/22 19:20	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	91		70 - 130	08/15/22 11:01	08/23/22 19:20	10
13C2 PFHxA	82		70 - 130	08/15/22 11:01	08/23/22 19:20	10
13C3 HFPO-DA	80		70 - 130	08/15/22 11:01	08/23/22 19:20	10
d5-NEtFOSAA	95		70 - 130	08/15/22 11:01	08/23/22 19:20	10

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93082-1

Client Sample ID: YTC-OFFP-303-DW-080122

Lab Sample ID: 410-93082-12

Date Collected: 08/01/22 13:51

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	2.8		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
Perfluoroheptanoic acid	1.1	J	1.7	1.3	0.42	ng/L		08/23/22 19:55	1
Perfluorooctanoic acid	1.4	J M	1.7	1.3	0.42	ng/L		08/23/22 19:55	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
Perfluorobutanesulfonic acid	2.3		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
Perfluorohexanesulfonic acid	7.7		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
Perfluorooctanesulfonic acid	1.7		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/23/22 19:55	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/23/22 19:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99		70 - 130	08/15/22 11:01	08/23/22 19:55	1
13C2 PFHxA	91		70 - 130	08/15/22 11:01	08/23/22 19:55	1
13C3 HFPO-DA	90		70 - 130	08/15/22 11:01	08/23/22 19:55	1
d5-NEtFOSAA	101		70 - 130	08/15/22 11:01	08/23/22 19:55	1

Client Sample ID: YTC-OFFP-FD-10-DW-080122

Lab Sample ID: 410-93082-13

Date Collected: 08/01/22 12:00

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	35		1.7	1.3	0.43	ng/L		08/23/22 20:06	1
Perfluoroheptanoic acid	12		1.7	1.3	0.43	ng/L		08/23/22 20:06	1
Perfluorooctanoic acid	14	M	1.7	1.3	0.43	ng/L		08/23/22 20:06	1
Perfluorononanoic acid	0.54	J	1.7	1.3	0.43	ng/L		08/23/22 20:06	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:06	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:06	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:06	1
Perfluorobutanesulfonic acid	16		1.7	1.3	0.43	ng/L		08/23/22 20:06	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:06	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:06	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:06	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:06	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:06	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:06	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:06	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102		70 - 130	08/15/22 11:01	08/23/22 20:06	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93082-1

Client Sample ID: YTC-OFFP-FD-10-DW-080122

Lab Sample ID: 410-93082-13

Date Collected: 08/01/22 12:00

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	94		70 - 130	08/15/22 11:01	08/23/22 20:06	1
13C3 HFPO-DA	97		70 - 130	08/15/22 11:01	08/23/22 20:06	1
d5-NEtFOSAA	100		70 - 130	08/15/22 11:01	08/23/22 20:06	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	82	D	17	13	4.3	ng/L		08/23/22 20:18	10
Perfluorooctanesulfonic acid	72	D	17	13	4.3	ng/L		08/23/22 20:18	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	90		70 - 130	08/15/22 11:01	08/23/22 20:18	10
13C2 PFHxA	84		70 - 130	08/15/22 11:01	08/23/22 20:18	10
13C3 HFPO-DA	84		70 - 130	08/15/22 11:01	08/23/22 20:18	10
d5-NEtFOSAA	92		70 - 130	08/15/22 11:01	08/23/22 20:18	10

Client Sample ID: YTC-OFFP-FD-06-DW-080122

Lab Sample ID: 410-93082-14

Date Collected: 08/01/22 12:00

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	0.43	J	1.7	1.3	0.43	ng/L		08/23/22 03:01	1
Perfluoroheptanoic acid	<1.3	Ac cn	1.7	1.3	0.43	ng/L		08/23/22 03:01	1
Perfluorooctanoic acid	<1.3	M	1.7	1.3	0.43	ng/L		08/23/22 03:01	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1
HFPODA	<1.3	Ac cn	1.7	1.3	0.43	ng/L		08/23/22 03:01	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 03:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	120		70 - 130	08/15/22 11:01	08/23/22 03:01	1
13C2 PFHxA	113		70 - 130	08/15/22 11:01	08/23/22 03:01	1
13C3 HFPO-DA	116		70 - 130	08/15/22 11:01	08/23/22 03:01	1
d5-NEtFOSAA	101		70 - 130	08/15/22 11:01	08/23/22 03:01	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93082-1

Client Sample ID: YTC-OFFP-317-DW-073022

Lab Sample ID: 410-93082-15

Date Collected: 07/30/22 08:51

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.1	J cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
Perfluoroheptanoic acid	0.68	J cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
Perfluorooctanoic acid	1.2	J cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
Perfluorobutanesulfonic acid	1.6	J cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
Perfluorohexanesulfonic acid	1.2	J cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
Perfluorooctanesulfonic acid	0.64	J M cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
HFPODA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
9CI-PF3ONS	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
11CI-PF3OUdS	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1
DONA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	105	cn	70 - 130	08/11/22 14:49	08/24/22 09:28	1
13C2 PFHxA	95	cn	70 - 130	08/11/22 14:49	08/24/22 09:28	1
13C3 HFPO-DA	93	cn	70 - 130	08/11/22 14:49	08/24/22 09:28	1
d5-NEtFOSAA	93	cn	70 - 130	08/11/22 14:49	08/24/22 09:28	1

Client Sample ID: YTC-OFFP-210-DW-073022

Lab Sample ID: 410-93082-16

Date Collected: 07/30/22 09:07

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
Perfluorobutanesulfonic acid	1.3	J cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
Perfluorohexanesulfonic acid	1.5	J cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
Perfluorooctanesulfonic acid	0.74	J cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
HFPODA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
9CI-PF3ONS	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
11CI-PF3OUdS	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1
DONA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 09:39	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93082-1

Client Sample ID: YTC-OFFP-210-DW-073022

Lab Sample ID: 410-93082-16

Date Collected: 07/30/22 09:07

Matrix: Drinking Water

Date Received: 08/02/22 10:24

<u>Surrogate</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
13C2 PFDA	110	cn	70 - 130	08/11/22 14:49	08/24/22 09:39	1
13C2 PFHxA	103	cn	70 - 130	08/11/22 14:49	08/24/22 09:39	1
13C3 HFPO-DA	98	cn	70 - 130	08/11/22 14:49	08/24/22 09:39	1
d5-NEtFOSAA	100	cn	70 - 130	08/11/22 14:49	08/24/22 09:39	1

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Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #410-93092-1

Analyses Performed By:
Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report #46494R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93092-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-124-DW-072522	410-93092-1	Water	7/25/2022		X
YTC-OFFP-FD-01-072522	410-93092-2	Water	7/25/2022	YTC-OFFP-124-DW-072522	X
YTC-OFFP-134-DW-072522	410-93092-3	Water	7/25/2022		X
YTC-OFFP-130-DW-072522	410-93092-4	Water	7/25/2022		X
YTC-OFFP-123-DW-072522	410-93092-5	Water	7/25/2022		X
YTC-OFFP-126-DW-072522	410-93092-6	Water	7/25/2022		X
YTC-OFFP-127-DW-072522	410-93092-7	Water	7/25/2022		X
YTC-OFFP-125-DW-072522	410-93092-8	Water	7/25/2022		X
YTC-OFFP-132-DW-072522	410-93092-9	Water	7/25/2022		X
YTC-OFFP-FRB-01-DW-072522	410-93092-10	Water	7/25/2022		X
YTC-OFFP-129-DW-072522	410-93092-11	Water	7/25/2022		X
YTC-OFFP-316-DW-072522	410-93092-12	Water	7/25/2022		X
YTC-OFFP-122-DW-072522	410-93092-13	Water	7/25/2022		X
YTC-OFFP-314-DW-072522	410-93092-14	Water	7/25/2022		X

Note:

1. Stage 3/4 validation was performed on sample location YTC-OFFP-316-DW-072522.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location YTC-OFFP-123-DW-072522.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in the data, but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

DATA REVIEW REPORT

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in EPA method 537 version 2.0 Table 4.

The ion transitions were as specified in Table 4 of the method.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis performed on sample location YTC-OFFP-123-DW-072522 exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

DATA REVIEW REPORT

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
YTC-OFFP-124-DW-072522/ YTC-OFFP-FD-01-072522	All target compounds	U	U	AC

Notes:

AC Acceptable

There were no target compounds detected in parent sample YTC-OFFP-124-DW-072522 or field duplicate sample YTC-OFFP-FD-01-072522.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

10. System Performance and Overall Assessment

Overall system performance was acceptable. There were no deviations specifically mentioned in this review; therefore, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate Standard %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Moisture Content	X				X
Stage 3/4 Validation					
Instrument performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %Rs		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
D. Transcription/calculations acceptable		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Sharon Pennington, Arcadis

SIGNATURE:



DATE: 08/17/2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: August 26, 2022

Tier 3
PFAS Calibration Standards %D

SDG #: J93092
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/17/2022
 Page: 1
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

PFHxS 08/11/2022 Calibration Instrument 24743

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.456	41001	2312417	28.68	0.017731	1.115174	1.3006	0.390988	0.456	-14.257	-14.3	MATCH
0.912	91438	2380341	28.68	0.038414	1.208014	1.3006	0.847077	0.912	-7.119	-7.1	MATCH
2.28	243445	2447263	28.68	0.099476	1.251309	1.3006	2.193591	2.28	-3.790	-3.8	MATCH
4.56	469153	2243521	28.68	0.209115	1.315221	1.3006	4.611262	4.56	1.124	1.1	MATCH
18.24	1778436	2130752	28.68	0.834652	1.31238	1.3006	18.40521	18.24	0.906	0.9	MATCH
Avg RF					1.240419	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: J93092
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/17/2022
 Page: 2
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

ICV 410-285062/8 8/11/2022 11:54 Instrument 24743 Page 276

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFHxS	237056	2340596	28.68	0.10128	1.3006	2.233366	2.36	-5.37	-5.5	Match
PFOS	206986	2340596	28.68	0.088433	1.224	2.072107	2.39	-13.30	-13.3	Match
PFOA	796594	2908018	10	0.27393	1.051	2.606377	2.5	4.26	4.3	Match

CCVIS 410-285146/48, 08/11/2022, 22:05 Instrument 24743 Page 294

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFHxS	1793739	2302433	28.68	0.779062	1.3006	17.17939	18.2	-5.61	-5.8	Match
PFOS	1692673	2302433	28.68	0.735167	1.224	17.22597	18.5	-6.89	-6.9	Match
PFOA	6031833	2857595	10	2.110808	1.051	20.0838	20	0.42	0.4	Match

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS LCS

SDG #: J93092
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/17/2022
Page: 3
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

LCS ID LCS 410-282801/2-A
ANALYTE PFHxS
REPORTED LCS %R 91
REPORTED LCSD %R NA
REPORTED RPD NA

Page

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration 66.4
LCSD Concentration _____
LCS TV 73
LCSD TV _____

LCS %R 90.96 MATCH

Tier 3
PFAS MS/MSD

SDG #: J93092
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/17/2022
Page: 4
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

MS/MSD Sample ID YTC-OFFP-123-DW-072522

ANALYTE PFHxS

REPORTED MS %R	<u>85</u>
REPORTED MSD %R	<u>85</u>
REPORTED RPD	<u>5</u>

$$\%R = \frac{100 * \text{MS Concentration}}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * | \text{MS \%R} - \text{MSD \%R} |}{\text{Average of MS MSD \%R}}$$

Sample Concentration	<u>1.3 U</u>
MS Concentration	<u>55.4</u>
MSD Concentration	<u>52.8</u>
MS TV	<u>65.4</u>
MSD TV	<u>62.2</u>

MS %R	<u>84.71</u>	MATCH
MSD %R	<u>84.89</u>	MATCH
RPD	<u>4.81</u>	MATCH

Tier 3
PFAS Sample Concentration

SDG #: J93092
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/17/2022
 Page: 5
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-316-DW-72522 Lab ID: 410-93092-12 Page 184

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxS	840893	2388011	28.68	0.352131	1.3006	7.76	1	294.5	26.37	26	Match
PFOS	591027	2388011	28.68	0.247498	1.224	5.80	1	294.5	19.69	20	Match
PFOA	430380	2831303	10	0.152008	1.051	1.45	1	294.5	4.91	4.9	Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: J93092
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/17/2022
Page: 6
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-316-DW-72522 Lab ID: 410-93092-12 Page 184

Surrogate d5-NEtFOSAA
REPORTED %R 94

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 37.7
Surrogate TV 40.0
%R 94.3 MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS



name

Chain of Custody Record

410-93092 Chain of Custody

Sampler <i>Andrew Kopchynski</i>	Lab PM Gordon, Stephen J	Camera Tracking No(s)	COC No 410-61650-17570.11
Phone <i>(631) 316-4206</i>	E-Mail Stephen.Gordon@et.eurofinsus.com	State of Origin <i>WA</i>	Page Page <i>1</i> of <i>23</i>

Andrew Kopchynski
Company: Seres Engineering & Services LLC
PWSID: _____

Address: 669 Marina Drive Suite B7	Due Date Requested:	Analysis Requested	Job #: <i>30059933</i>
City: Charleston	TAT Requested (days): <i>Normal</i>		
State, Zip: SC, 29492	Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Phone: 720-344-3712(Tel)	PO #: D18-218 PFAS PA/SI		
Email: afkopchynski@seres-es.com	WO #: 3005993 YTC00		
Project Name: Yakima Training Center (YTC)	Project #: 41011531		
Site: _____	SSOW#:	Preservation Codes:	

- A - HCL
- B - NaOH
- C - Zn Acetate
- D - Nitric Acid
- E - NaHSO4
- F - MeOH
- G - Amchlor
- H - Ascorbic Acid
- I - Ice
- J - DI Water
- K - EDTA
- L - EDA
- M - Hexane
- N - None
- O - AsNaO2
- P - Na2O4S
- Q - Na2SO3
- R - Na2S2O3
- S - H2SO4
- T - TSP Dodecahydrate
- U - Acetone
- V - MCAA
- W - pH 4-5
- Y - Trizma
- Z - other (specify)

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=soil, BT=Tissue, A=Air)	537.1_DW - DW EPA 537.1 List of 16	Special Instructions/Note:
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YTC-OFFP- <i>124-DW-072522</i>	<i>07/25/22</i>	<i>1200</i>	<i>G</i>	<i>Drinking Water</i>	<i>NN</i>	
YTC-OFFP- <i>FD-01-072522</i>	<i>07/25/22</i>	<i>1200</i>	<i>G</i>	<i>Drinking Water</i>	<i>NN</i>	
YTC-OFFP- <i>128-DW-072522</i>	<i>07/25/22</i>	<i>1047</i>	—	<i>Drinking Water</i>	<i>NN</i>	
YTC-OFFP- <i>134-DW-072522</i>	<i>07/25/22</i>	<i>1434</i>	<i>G</i>	<i>Drinking Water</i>	<i>NN</i>	
YTC-OFFP- <i>130-DW-072522</i>	<i>07/25/22</i>	<i>1330</i>	<i>G</i>	<i>Drinking Water</i>	<i>NN</i>	
YTC-OFFP- <i>123-DW-072522</i>	<i>07/25/22</i>	<i>1047</i>	<i>G</i>	<i>Drinking Water</i>	<i>NY</i>	<i>MS/MSD</i>
YTC-OFFP- <i>126-DW-072522</i>	<i>07/25/22</i>	<i>1118</i>	<i>G</i>	<i>Drinking Water</i>	<i>NN</i>	
YTC-OFFP- <i>127-DW-072522</i>	<i>07/25/22</i>	<i>1220</i>	<i>G</i>	<i>Drinking Water</i>	<i>NN</i>	
YTC-OFFP- <i>125-DW-072522</i>	<i>07/25/22</i>	<i>1018</i>	<i>G</i>	<i>Drinking Water</i>	<i>NN</i>	
YTC-OFFP- <i>132-DW-072522</i>	<i>07/25/22</i>	<i>1414</i>	<i>G</i>	<i>Drinking Water</i>	<i>NN</i>	
YTC-OFFP- <i>FRB-01-DW-072522</i>	<i>07/25/22</i>	<i>1738</i>	<i>G</i>	<i>Drinking Water</i>	<i>NN</i>	

Possible Hazard Identification: Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return To Client Disposal By Lab Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: <i>Ben Mc...</i>	Date/Time: <i>07/28/22 1618</i>	Company: <i>Seres</i>	Received by: _____ Date/Time: _____ Company: _____
Relinquished by:	Date/Time:	Company:	Received by: _____ Date/Time: _____ Company: _____
Relinquished by:	Date/Time:	Company:	Received by: <i>JA</i> Date/Time: <i>8/2/22 10:24</i> Company: <i>ECU</i>

Cooler Temperature(s) *C and Other Remarks: *1.7*

Custody Seals Intact: Yes No

Custody Seal No.:

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 410-93092-1

Login Number: 93092

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 1

Creator: Bryan, Debra A

Question	Answer	Comment
The cooler's custody seal is intact.	True	
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 ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	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	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace $>6\text{mm}$ in diameter (none, if from WV)?	True	

Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93092-1

Qualifiers

LCMS

Qualifier	Qualifier Description
E	Result exceeded calibration range.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
M	Manual integrated compound.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
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

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93092-1

Client Sample ID: YTC-OFFP-124-DW-072522

Lab Sample ID: 410-93092-1

Date Collected: 07/25/22 12:00

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
NEtFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
NMeFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
HFPODA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
9CI-PF3ONS	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1
DONA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 21:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	92		70 - 130	08/04/22 10:19	08/11/22 21:19	1
13C2 PFHxA	87		70 - 130	08/04/22 10:19	08/11/22 21:19	1
13C3 HFPO-DA	86		70 - 130	08/04/22 10:19	08/11/22 21:19	1
d5-NEtFOSAA	89		70 - 130	08/04/22 10:19	08/11/22 21:19	1

Client Sample ID: YTC-OFFP-FD-01-072522

Lab Sample ID: 410-93092-2

Date Collected: 07/25/22 12:00

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:30	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93092-1

Client Sample ID: YTC-OFFP-FD-01-072522

Lab Sample ID: 410-93092-2

Date Collected: 07/25/22 12:00

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130	08/04/22 10:19	08/11/22 21:30	1
13C2 PFHxA	92		70 - 130	08/04/22 10:19	08/11/22 21:30	1
13C3 HFPO-DA	89		70 - 130	08/04/22 10:19	08/11/22 21:30	1
d5-NEtFOSAA	85		70 - 130	08/04/22 10:19	08/11/22 21:30	1

Client Sample ID: YTC-OFFP-134-DW-072522

Lab Sample ID: 410-93092-3

Date Collected: 07/25/22 14:34

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
Perfluorohexanesulfonic acid	0.49	J	1.7	1.3	0.42	ng/L		08/11/22 21:42	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 21:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130	08/04/22 10:19	08/11/22 21:42	1
13C2 PFHxA	94		70 - 130	08/04/22 10:19	08/11/22 21:42	1
13C3 HFPO-DA	94		70 - 130	08/04/22 10:19	08/11/22 21:42	1
d5-NEtFOSAA	92		70 - 130	08/04/22 10:19	08/11/22 21:42	1

Client Sample ID: YTC-OFFP-130-DW-072522

Lab Sample ID: 410-93092-4

Date Collected: 07/25/22 13:30

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93092-1

Client Sample ID: YTC-OFFP-130-DW-072522

Lab Sample ID: 410-93092-4

Date Collected: 07/25/22 13:30

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 21:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	98		70 - 130				08/04/22 10:19	08/11/22 21:53	1
13C2 PFHxA	93		70 - 130				08/04/22 10:19	08/11/22 21:53	1
13C3 HFPO-DA	92		70 - 130				08/04/22 10:19	08/11/22 21:53	1
d5-NEtFOSAA	86		70 - 130				08/04/22 10:19	08/11/22 21:53	1

Client Sample ID: YTC-OFFP-123-DW-072522

Lab Sample ID: 410-93092-5

Date Collected: 07/25/22 10:47

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 22:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130				08/04/22 10:19	08/11/22 22:17	1
13C2 PFHxA	95		70 - 130				08/04/22 10:19	08/11/22 22:17	1
13C3 HFPO-DA	92		70 - 130				08/04/22 10:19	08/11/22 22:17	1
d5-NEtFOSAA	92		70 - 130				08/04/22 10:19	08/11/22 22:17	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93092-1

Client Sample ID: YTC-OFFP-126-DW-072522

Lab Sample ID: 410-93092-6

Date Collected: 07/25/22 11:18

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/11/22 22:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	104		70 - 130	08/04/22 10:19	08/11/22 22:51	1
13C2 PFHxA	91		70 - 130	08/04/22 10:19	08/11/22 22:51	1
13C3 HFPO-DA	92		70 - 130	08/04/22 10:19	08/11/22 22:51	1
d5-NEtFOSAA	91		70 - 130	08/04/22 10:19	08/11/22 22:51	1

Client Sample ID: YTC-OFFP-127-DW-072522

Lab Sample ID: 410-93092-7

Date Collected: 07/25/22 12:20

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:03	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93092-1

Client Sample ID: YTC-OFFP-127-DW-072522

Lab Sample ID: 410-93092-7

Date Collected: 07/25/22 12:20

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99		70 - 130	08/04/22 10:19	08/11/22 23:03	1
13C2 PFHxA	96		70 - 130	08/04/22 10:19	08/11/22 23:03	1
13C3 HFPO-DA	93		70 - 130	08/04/22 10:19	08/11/22 23:03	1
d5-NEtFOSAA	93		70 - 130	08/04/22 10:19	08/11/22 23:03	1

Client Sample ID: YTC-OFFP-125-DW-072522

Lab Sample ID: 410-93092-8

Date Collected: 07/25/22 10:18

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 23:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	107		70 - 130	08/04/22 10:19	08/11/22 23:14	1
13C2 PFHxA	96		70 - 130	08/04/22 10:19	08/11/22 23:14	1
13C3 HFPO-DA	94		70 - 130	08/04/22 10:19	08/11/22 23:14	1
d5-NEtFOSAA	89		70 - 130	08/04/22 10:19	08/11/22 23:14	1

Client Sample ID: YTC-OFFP-132-DW-072522

Lab Sample ID: 410-93092-9

Date Collected: 07/25/22 14:14

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93092-1

Client Sample ID: YTC-OFFP-132-DW-072522

Lab Sample ID: 410-93092-9

Date Collected: 07/25/22 14:14

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:26	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	106		70 - 130				08/04/22 10:19	08/11/22 23:26	1
13C2 PFHxA	98		70 - 130				08/04/22 10:19	08/11/22 23:26	1
13C3 HFPO-DA	94		70 - 130				08/04/22 10:19	08/11/22 23:26	1
d5-NEtFOSAA	92		70 - 130				08/04/22 10:19	08/11/22 23:26	1

Client Sample ID: YTC-OFFP-FRB-01-DW-072522

Lab Sample ID: 410-93092-10

Date Collected: 07/25/22 17:38

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	102		70 - 130				08/04/22 10:19	08/11/22 23:37	1
13C2 PFHxA	93		70 - 130				08/04/22 10:19	08/11/22 23:37	1
13C3 HFPO-DA	89		70 - 130				08/04/22 10:19	08/11/22 23:37	1
d5-NEtFOSAA	95		70 - 130				08/04/22 10:19	08/11/22 23:37	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93092-1

Client Sample ID: YTC-OFFP-129-DW-072522

Lab Sample ID: 410-93092-11

Date Collected: 07/25/22 14:06

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
Perfluorohexanesulfonic acid	0.50	J	1.7	1.3	0.43	ng/L		08/11/22 23:49	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 23:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130	08/04/22 10:19	08/11/22 23:49	1
13C2 PFHxA	96		70 - 130	08/04/22 10:19	08/11/22 23:49	1
13C3 HFPO-DA	92		70 - 130	08/04/22 10:19	08/11/22 23:49	1
d5-NEtFOSAA	89		70 - 130	08/04/22 10:19	08/11/22 23:49	1

Client Sample ID: YTC-OFFP-316-DW-072522

Lab Sample ID: 410-93092-12

Date Collected: 07/25/22 15:20

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	10		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
Perfluoroheptanoic acid	3.0		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
Perfluorooctanoic acid	4.9		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
Perfluorobutanesulfonic acid	6.3		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
Perfluorohexanesulfonic acid	26		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
Perfluorooctanesulfonic acid	20		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:00	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:00	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93092-1

Client Sample ID: YTC-OFFP-316-DW-072522

Lab Sample ID: 410-93092-12

Date Collected: 07/25/22 15:20

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	109		70 - 130	08/04/22 10:19	08/12/22 00:00	1
13C2 PFHxA	95		70 - 130	08/04/22 10:19	08/12/22 00:00	1
13C3 HFPO-DA	93		70 - 130	08/04/22 10:19	08/12/22 00:00	1
d5-NEtFOSAA	94		70 - 130	08/04/22 10:19	08/12/22 00:00	1

Client Sample ID: YTC-OFFP-122-DW-072522

Lab Sample ID: 410-93092-13

Date Collected: 07/25/22 11:39

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
Perfluorobutanesulfonic acid	0.46	J	1.7	1.3	0.43	ng/L		08/12/22 00:23	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 00:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102		70 - 130	08/04/22 10:19	08/12/22 00:23	1
13C2 PFHxA	94		70 - 130	08/04/22 10:19	08/12/22 00:23	1
13C3 HFPO-DA	93		70 - 130	08/04/22 10:19	08/12/22 00:23	1
d5-NEtFOSAA	101		70 - 130	08/04/22 10:19	08/12/22 00:23	1

Client Sample ID: YTC-OFFP-314-DW-072522

Lab Sample ID: 410-93092-14

Date Collected: 07/25/22 09:44

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93092-1

Client Sample ID: YTC-OFFP-314-DW-072522

Lab Sample ID: 410-93092-14

Date Collected: 07/25/22 09:44

Matrix: Drinking Water

Date Received: 08/02/22 10:24

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 00:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	105		70 - 130	08/04/22 10:19	08/12/22 00:35	1
13C2 PFHxA	95		70 - 130	08/04/22 10:19	08/12/22 00:35	1
13C3 HFPO-DA	92		70 - 130	08/04/22 10:19	08/12/22 00:35	1
d5-NEtFOSAA	92		70 - 130	08/04/22 10:19	08/12/22 00:35	1

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #410-93099-1

Analyses Performed By:

Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report #46633R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93099-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-143-DW-072622	410-93099-1	Water	7/26/2022		X
YTC-OFFP-149-DW-072622	410-93099-2	Water	7/26/2022		X
YTC-OFFP-142-DW-072622	410-93099-3	Water	7/26/2022		X
YTC-OFFP-136-DW-072622	410-93099-4	Water	7/26/2022		X
YTC-OFFP-145-DW-072622	410-93099-5	Water	7/26/2022		X
YTC-OFFP-FD02-072622	410-93099-6	Water	7/26/2022	YTC-OFFP-143-DW-072622	X
YTC-OFFP-251-DW-072622	410-93099-7	Water	7/26/2022		X
YTC-OFFP-264-DW-072622	410-93099-8	Water	7/26/2022		X
YTC-OFFP-138-DW-072622	410-93099-9	Water	7/26/2022		X
YTC-OFFP-257-DW-072622	410-93099-10	Water	7/26/2022		X
YTC-OFFP-137-DW-072622	410-93099-11	Water	7/26/2022		X

Note:

1. Stage 3/4 validation was performed on sample location YTC-OFFP-149-DW-072622.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location YTC-OFFP-143-DW-072622

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Yakima, Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

Samples were re-extracted past holding time at 22 days from collection due to LCS recoveries outside control limits. The data was reviewed, and the initial analysis is reported. See Section 7.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard recoveries were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

DATA REVIEW REPORT

All compounds associated with the continuing calibration verification standard recoveries were within the method specified control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

Sample locations associated with surrogate exhibiting recoveries just outside of the control limits are presented in the following table.

Sample Locations	Surrogate	%R	RE %R
YTC-OFFP-136-DW-072622	13C2 PFHxA	< 70% but > 10%	AC
	13C3 HFPO-DA		
	13C6 PFDA	AC	
	d5-EtFOSAA	< 70% but > 10%	
YTC-OFFP-257-DW-072622	13C2 PFHxA	AC	AC
	13C3 HFPO-DA	< 70% but > 10%	
	13C6 PFDA	AC	
	d5-EtFOSAA	< 70% but > 10%	

Note:

AC Acceptable

Where a re-extracted analysis was performed, results are reported from the analysis in bold above.

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 130%	Non-detect	No Action
	Detect	J+
< 70% but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	R
	Detect	J

DATA REVIEW REPORT

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

Sample locations associated with the LCS/LCSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	LCS %R	LCSD %R
YTC-OFFP-142-DW-072622	Perfluorohexanesulfonic acid	AC	<70% but >10%
YTC-OFFP-136-DW-072622	Perfluorooctanesulfonic acid	<70% but >10%	<70% but >10%
YTC-OFFP-145-DW-072622			
YTC-OFFP-FD02-072622	NEtFOSAA	AC	<70% but >10%
YTC-OFFP-251-DW-072622	NMeFOSAA	AC	<70% but >10%
YTC-OFFP-264-DW-072622			
YTC-OFFP-138-DW-072622	9Cl-PF3ONS	<70% but >10%	<70% but >10%
YTC-OFFP-257-DW-072622	11Cl-PF3OUdS	<70% but >10%	<70% but >10%
YTC-OFFP-137-DW-072622			

All samples associated with the LCS/LCSD with recoveries slightly below control limits were re-extracted outside the required holding time. The recoveries in the re-extracted analytical run exhibited LCS/LCSD within the QC acceptance limits. The initial results were confirmed by the re-analyses. The initial results are marked as reportable.

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

DATA REVIEW REPORT

Control Limit	Sample Result	Qualification
< 70% but > 10%	Non-detect	UJ
	Detect	J-

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
YTC-OFFP-143-DW-072622/ YTC-OFFP-FD02-072622	All target PFAS compounds	U	U	AC

Notes:

AC Acceptable

The results for the parent sample and field duplicate were all non-detect and are acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field reagent blanks	X				X
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate(LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate Standard %R		X	X		
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %Rs		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculations acceptable		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Sharon Pennington, Arcadis

SIGNATURE:



DATE: 09/06/2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: 9/08/2022

Tier 3
PFAS Calibration Standards %D

SDG #: J93099
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 9/1/2022
 Page: 1
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

PFOS, 08/09/2022 Calibration Instrument 24743

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	42395	2265344	28.68	0.018715	1.159254	1.2296	0.436512	0.463	-5.721	-5.7	MATCH
0.926	84531	2421541	28.68	0.034908	1.081166	1.2296	0.814216	0.926	-12.072	-12	MATCH
2.31	238357	2341122	28.68	0.101813	1.26407	1.2296	2.374757	2.31	2.803	2.6	MATCH
4.63	450354	2354240	28.68	0.191295	1.184954	1.2296	4.461887	4.63	-3.631	-3.6	MATCH
18.5	1725997	2146817	28.68	0.80398	1.246386	1.2296	18.75255	18.5	1.365	1.3	MATCH
Avg RF					1.187166	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: J93099
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 9/2/2022
 Page: 2
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

ICV 410-284153/8 8/9/2022 12:43 Instrument 24743 Page 542

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFHxS	221993	2359543	28.68	0.094083	1.2059	2.237583	2.36	-5.19	-5.3	Match
PFOS	204025	2359543	28.68	0.086468	1.2296	2.016837	2.39	-15.61	-15.6	Match
PFOA	832893	3249413	10	0.256321	1.045	2.452833	2.5	-1.89	-1.9	Match

CCVLIS 410-284153/1, 08/10/2022, 15:23 Instrument 24743 Page 548

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFHxS	38808	2205964	28.68	0.017592	1.2059	0.418399	0.456	-8.25	-8.2	Match
PFOS	38675	2205964	28.68	0.017532	1.2296	0.408928	0.463	-11.68	-11.6	Match
PFOA	141211	2936017	10	0.048096	1.045	0.46025	0.5	-7.95	-8	Match

CCVIS 410-284721/54, 08/11/2022, 01:34 Instrument 24743 Page 554

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFHxS	229533	2309570	28.68	0.099383	1.2059	2.364	2.280	3.67	3.7	Match
PFOS	224854	2309570	28.68	0.097358	1.2296	2.271	2.310	-1.70	-1.9	Match
PFOA	844342	3030081	10	0.278653	1.045	2.667	2.500	6.66	6.7	Match

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS LCS

SDG #: J93099
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 9/2/2022
Page: 3
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

LCS ID	<u>LCS/LCSD 410-283118/2-A,3-A</u>
ANALYTE	<u>PFOS</u>
REPORTED LCS %R	<u>69</u>
REPORTED LCSD %R	<u>67</u>
REPORTED RPD	<u>2</u>

Pages: 113 & 115

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration	<u>13</u>
LCSD Concentration	<u>12.7</u>
LCS TV	<u>19</u>
LCSD TV	<u>19</u>

LCS %R	68.42 MATCH
LCSD %R	66.84 MATCH
RPD	2.33 MATCH

Tier 3
PFAS MS/MSD

SDG #: J93099
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 9/2/2022
Page: 4
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

MS/MSD Sample ID YTC-OFFP-143-DW-072622 MS/MSD Pages: 117 & 118

ANALYTE	PFOS
REPORTED MS %R	<u>83</u>
REPORTED MSD %R	<u>84</u>
REPORTED RPD	<u>2</u>

$$\%R = \frac{100 * \text{MS Concentration}}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * | \text{MS \%R} - \text{MSD \%R} |}{\text{Average of MS MSD \%R}}$$

Sample Concentration	<u>0</u>
MS Concentration	<u>13.8</u>
MSD Concentration	<u>13.5</u>
MS TV	<u>16.6</u>
MSD TV	<u>16.0</u>

MS %R	<u>83.13</u> MATCH
MSD %R	<u>84.38</u> MATCH
RPD	<u>2.20</u> MATCH

Tier 3
PFAS Sample Concentration

SDG #: J93099
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 9/2/2022
 Page: 5
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-149-DW-72622 Lab ID: 410-93099-2 Page 141
 Instrument 24743 8/11/2022 3:18

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFHxS	21207	2427341	28.68	0.008737	1.2059	0.21	1	264	0.79	0.79 J
PFOS	96726	2427341	28.68	0.039849	1.2296	0.93	1	264	3.52	3.5
PFOA	126631	3041893	10	0.041629	1.045	0.40	1	264	1.51	1.5 J

Match
Match
Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: J93099
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 9/2/2022
Page: 6
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-136-DW-072622 Lab ID: 410-93099-4

Surrogate: 13C2_PFHxA

REPORTED %R: 67

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration	<u>6.72</u>	Page 163
Surrogate TV	<u>10.0</u>	
%R	67.2	MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS





410-93099 Chain of Custody

Environme

Chain of Custody Record



Environment Testing America

Sampler Andrew Kopchynski	Lab PM: Gordon, Stephen J	Carrier Tracking No(s):	COC No 410-61650-17570.3
Phone (631) 316-4206	E-Mail Stephen.Gordon@et.eurofinsus.com	State of Origin WA	Page 1 Page 2 of 26

Andrew Kopchynski
 Company
Seres Engineering & Services LLC
 Address:
 669 Marina Drive Suite B7
 City
 Charleston
 State, Zip
 SC, 29492
 Phone:
 720-344-3712(Tel)
 Email:
 afkopchynski@seres-es.com
 Project Name
 Yakima Training Center (YTC)
 Site
 —

PWSID

Analysis Requested

Due Date Requested:

TAT Requested (days):
Standard

Compliance Project: Yes No

PO #
D18-218 PFAS PA/SI

WO #
3005993.YTC00

Project #:
41011531

SSOW#:

Job #
30059933

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4.5
L - EDA	Y - Trizma
	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, B=solid, O=water/oil, BT=Tissue, A=Air)	Preservation Code	YTC Number	Special Instructions/Note:
YTC-OFFP-143-DW-0726	7-26-22	11:25	G	Drinking Water	NY		MS/MSP
YTC-OFFP-149-DW-0726		11:04		Drinking Water			
YTC-OFFP-142-DW-0726		10:34		Drinking Water			
YTC-OFFP-136-DW-0726		09:50		Drinking Water			
YTC-OFFP-145-DW-0726		11:48		Drinking Water			
YTC-OFFP-FD02-0726				Drinking Water			
YTC-OFFP-251-DW-0726		15:03		Drinking Water			
YTC-OFFP-264-DW-0726		14:18		Drinking Water			
YTC-OFFP-138-DW-0726		09:28		Drinking Water			
YTC-OFFP-257-DW-0726		13:44		Drinking Water			
YTC-OFFP-137-DW-0726		10:15		Drinking Water			

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: _____ **Date:** _____ **Time:** _____ **Method of Shipment:** _____

Relinquished by Ben Mc	Date/Time 07/28/22 1558	Company Seres	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time 8/2/22 10:30	Company ELET

Custody Seals Intact: Yes No Custody Seal No.: _____

Cooler Temperature(s) °C and Other Remarks: _____

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 410-93099-1

Login Number: 93099

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 1

Creator: Bryan, Debra A

Question	Answer	Comment
The cooler's custody seal is intact.	True	
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 ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	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	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace $>6\text{mm}$ in diameter (none, if from WV)?	True	

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93099-1

Client Sample ID: YTC-OFFP-143-DW-072622

Lab Sample ID: 410-93099-1

Date Collected: 07/26/22 11:25

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/11/22 02:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	104		70 - 130	08/04/22 10:11	08/11/22 02:44	1
13C2 PFHxA	104		70 - 130	08/04/22 10:11	08/11/22 02:44	1
13C3 HFPO-DA	105		70 - 130	08/04/22 10:11	08/11/22 02:44	1
d5-NEtFOSAA	82		70 - 130	08/04/22 10:11	08/11/22 02:44	1

Client Sample ID: YTC-OFFP-149-DW-072622

Lab Sample ID: 410-93099-2

Date Collected: 07/26/22 11:04

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	0.74	J	1.9	1.4	0.47	ng/L		08/11/22 03:18	1
Perfluoroheptanoic acid	0.52	J	1.9	1.4	0.47	ng/L		08/11/22 03:18	1
Perfluorooctanoic acid	1.5	J	1.9	1.4	0.47	ng/L		08/11/22 03:18	1
Perfluorononanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 03:18	1
Perfluorodecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 03:18	1
Perfluorotridecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 03:18	1
Perfluorotetradecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 03:18	1
Perfluorobutanesulfonic acid	2.6		1.9	1.4	0.47	ng/L		08/11/22 03:18	1
Perfluorohexanesulfonic acid	0.79	J	1.9	1.4	0.47	ng/L		08/11/22 03:18	1
Perfluorooctanesulfonic acid	3.5		1.9	1.4	0.47	ng/L		08/11/22 03:18	1
NEtFOSAA	<1.4		1.9	1.4	0.47	ng/L		08/11/22 03:18	1
NMeFOSAA	<1.4		1.9	1.4	0.47	ng/L		08/11/22 03:18	1
Perfluoroundecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 03:18	1
Perfluorododecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 03:18	1
HFPODA	<1.4		1.9	1.4	0.47	ng/L		08/11/22 03:18	1
9CI-PF3ONS	<1.4		1.9	1.4	0.47	ng/L		08/11/22 03:18	1
11CI-PF3OUdS	<1.4		1.9	1.4	0.47	ng/L		08/11/22 03:18	1
DONA	<1.4		1.9	1.4	0.47	ng/L		08/11/22 03:18	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93099-1

Client Sample ID: YTC-OFFP-149-DW-072622

Lab Sample ID: 410-93099-2

Date Collected: 07/26/22 11:04

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130	08/04/22 10:11	08/11/22 03:18	1
13C2 PFHxA	103		70 - 130	08/04/22 10:11	08/11/22 03:18	1
13C3 HFPO-DA	101		70 - 130	08/04/22 10:11	08/11/22 03:18	1
d5-NEtFOSAA	86		70 - 130	08/04/22 10:11	08/11/22 03:18	1

Client Sample ID: YTC-OFFP-142-DW-072622

Lab Sample ID: 410-93099-3

Date Collected: 07/26/22 10:34

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/15/22 21:03	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/15/22 21:03	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/15/22 21:03	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/15/22 21:03	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/15/22 21:03	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/15/22 21:03	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/15/22 21:03	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/15/22 21:03	1
Perfluorohexanesulfonic acid	<1.3	*-cn UJ	1.7	1.3	0.42	ng/L		08/15/22 21:03	1
Perfluorooctanesulfonic acid	<1.3	*-cn UJ	1.7	1.3	0.42	ng/L		08/15/22 21:03	1
NEtFOSAA	<1.3	*-cn UJ	1.7	1.3	0.42	ng/L		08/15/22 21:03	1
NMeFOSAA	<1.3	*-cn UJ	1.7	1.3	0.42	ng/L		08/15/22 21:03	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/15/22 21:03	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/15/22 21:03	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/15/22 21:03	1
9CI-PF3ONS	<1.3	*-cn UJ	1.7	1.3	0.42	ng/L		08/15/22 21:03	1
11CI-PF3OUdS	<1.3	*-cn UJ	1.7	1.3	0.42	ng/L		08/15/22 21:03	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/15/22 21:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	96		70 - 130	08/05/22 07:35	08/15/22 21:03	1
13C2 PFHxA	86		70 - 130	08/05/22 07:35	08/15/22 21:03	1
13C3 HFPO-DA	73		70 - 130	08/05/22 07:35	08/15/22 21:03	1
d5-NEtFOSAA	70		70 - 130	08/05/22 07:35	08/15/22 21:03	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
NEtFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
NMeFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93099-1

~~Client Sample ID: YTC-OFFP-142-DW-072622~~

~~Lab Sample ID: 410-93099-3~~

~~Date Collected: 07/26/22 10:34~~

~~Matrix: Drinking Water~~

~~Date Received: 08/02/22 10:32~~

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
HFPODA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
9CI-PF3ONS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
11CI-PF3OUdS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1
DONA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99		70 - 130	08/17/22 11:16	08/24/22 01:00	1
13C2 PFHxA	101		70 - 130	08/17/22 11:16	08/24/22 01:00	1
13C3 HFPO-DA	92		70 - 130	08/17/22 11:16	08/24/22 01:00	1
d5-NEtFOSAA	97		70 - 130	08/17/22 11:16	08/24/22 01:00	1

Client Sample ID: YTC-OFFP-136-DW-072622

Lab Sample ID: 410-93099-4

Date Collected: 07/26/22 09:50

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2	UJ	1.7	1.2	0.41	ng/L		08/11/22 17:17	1
Perfluoroheptanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/11/22 17:17	1
Perfluorooctanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/11/22 17:17	1
Perfluorononanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/11/22 17:17	1
Perfluorodecanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/11/22 17:17	1
Perfluorotridecanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/11/22 17:17	1
Perfluorotetradecanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/11/22 17:17	1
Perfluorobutanesulfonic acid	<1.2		1.7	1.2	0.41	ng/L		08/11/22 17:17	1
Perfluorohexanesulfonic acid	<1.2	*-cn	1.7	1.2	0.41	ng/L		08/11/22 17:17	1
Perfluorooctanesulfonic acid	<1.2	*-cn	1.7	1.2	0.41	ng/L		08/11/22 17:17	1
NEtFOSAA	<1.2	*-cn	1.7	1.2	0.41	ng/L		08/11/22 17:17	1
NMeFOSAA	<1.2	*-cn	1.7	1.2	0.41	ng/L		08/11/22 17:17	1
Perfluoroundecanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/11/22 17:17	1
Perfluorododecanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/11/22 17:17	1
HFPODA	<1.2		1.7	1.2	0.41	ng/L		08/11/22 17:17	1
9CI-PF3ONS	<1.2	*-cn	1.7	1.2	0.41	ng/L		08/11/22 17:17	1
11CI-PF3OUdS	<1.2	*-cn	1.7	1.2	0.41	ng/L		08/11/22 17:17	1
DONA	<1.2		1.7	1.2	0.41	ng/L		08/11/22 17:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	76		70 - 130	08/05/22 07:35	08/11/22 17:17	1
13C2 PFHxA	67	S1-	70 - 130	08/05/22 07:35	08/11/22 17:17	1
13C3 HFPO-DA	55	S1-	70 - 130	08/05/22 07:35	08/11/22 17:17	1
d5-NEtFOSAA	66	S1-	70 - 130	08/05/22 07:35	08/11/22 17:17	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93099-1

~~Client Sample ID: YTC-OFFP-136-DW-072622~~

~~Lab Sample ID: 410-93099-4~~

~~Date Collected: 07/26/22 09:50~~

~~Matrix: Drinking Water~~

~~Date Received: 08/02/22 10:32~~

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
NEtFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
NMeFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
HFPODA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
9Cl-PF3ONS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
11Cl-PF3OUdS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1
DONA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 01:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	96		70 - 130	08/17/22 11:16	08/24/22 01:12	1
13C2 PFHxA	91		70 - 130	08/17/22 11:16	08/24/22 01:12	1
13C3 HFPO-DA	88		70 - 130	08/17/22 11:16	08/24/22 01:12	1
d5-NEtFOSAA	85		70 - 130	08/17/22 11:16	08/24/22 01:12	1

Client Sample ID: YTC-OFFP-145-DW-072622

Lab Sample ID: 410-93099-5

Date Collected: 07/26/22 11:48

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	2.8		1.7	1.3	0.43	ng/L		08/11/22 17:40	1
Perfluoroheptanoic acid	0.44	J	1.7	1.3	0.43	ng/L		08/11/22 17:40	1
Perfluorooctanoic acid	2.4		1.7	1.3	0.43	ng/L		08/11/22 17:40	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 17:40	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 17:40	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 17:40	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 17:40	1
Perfluorobutanesulfonic acid	0.45	J	1.7	1.3	0.43	ng/L		08/11/22 17:40	1
Perfluorohexanesulfonic acid	0.56	J*cn J-	1.7	1.3	0.43	ng/L		08/11/22 17:40	1
Perfluorooctanesulfonic acid	3.0	*cn J-	1.7	1.3	0.43	ng/L		08/11/22 17:40	1
NEtFOSAA	<1.3	*cn UJ	1.7	1.3	0.43	ng/L		08/11/22 17:40	1
NMeFOSAA	<1.3	*cn UJ	1.7	1.3	0.43	ng/L		08/11/22 17:40	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 17:40	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 17:40	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 17:40	1
9Cl-PF3ONS	<1.3	*cn UJ	1.7	1.3	0.43	ng/L		08/11/22 17:40	1
11Cl-PF3OUdS	<1.3	*cn UJ	1.7	1.3	0.43	ng/L		08/11/22 17:40	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 17:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	84		70 - 130	08/05/22 07:35	08/11/22 17:40	1
13C2 PFHxA	76		70 - 130	08/05/22 07:35	08/11/22 17:40	1
13C3 HFPO-DA	71		70 - 130	08/05/22 07:35	08/11/22 17:40	1
d5-NEtFOSAA	75		70 - 130	08/05/22 07:35	08/11/22 17:40	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93099-1

Client Sample ID: YTC-OFFP-145-DW-072622

Lab Sample ID: 410-93099-5

Date Collected: 07/26/22 11:48

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	3.6	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
Perfluoroheptanoic acid	0.71	J H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
Perfluorooctanoic acid	2.9	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
Perfluorononanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
Perfluorodecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
Perfluorotridecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
Perfluorotetradecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
Perfluorobutanesulfonic acid	0.59	J H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
Perfluorohexanesulfonic acid	0.73	J H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
Perfluorooctanesulfonic acid	3.7	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
NEtFOSAA	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
NMeFOSAA	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
Perfluoroundecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
Perfluorododecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
HFPODA	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
9CI-PF3ONS	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
11CI-PF3OUdS	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1
DONA	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	96		70 - 130	08/17/22 11:16	08/24/22 01:23	1
13C2 PFHxA	98		70 - 130	08/17/22 11:16	08/24/22 01:23	1
13C3 HFPO-DA	92		70 - 130	08/17/22 11:16	08/24/22 01:23	1
d5-NEtFOSAA	85		70 - 130	08/17/22 11:16	08/24/22 01:23	1

Client Sample ID: YTC-OFFP-FD02-072622

Lab Sample ID: 410-93099-6

Date Collected: 07/26/22 00:00

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/15/22 21:26	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/15/22 21:26	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/15/22 21:26	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/15/22 21:26	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/15/22 21:26	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/15/22 21:26	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/15/22 21:26	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/15/22 21:26	1
Perfluorohexanesulfonic acid	<1.3	*-cn UJ	1.7	1.3	0.43	ng/L		08/15/22 21:26	1
Perfluorooctanesulfonic acid	<1.3	*-cn UJ	1.7	1.3	0.43	ng/L		08/15/22 21:26	1
NEtFOSAA	<1.3	*-cn UJ	1.7	1.3	0.43	ng/L		08/15/22 21:26	1
NMeFOSAA	<1.3	*-cn UJ	1.7	1.3	0.43	ng/L		08/15/22 21:26	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/15/22 21:26	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/15/22 21:26	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/15/22 21:26	1
9CI-PF3ONS	<1.3	*-cn UJ	1.7	1.3	0.43	ng/L		08/15/22 21:26	1
11CI-PF3OUdS	<1.3	*-cn UJ	1.7	1.3	0.43	ng/L		08/15/22 21:26	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/15/22 21:26	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93099-1

Client Sample ID: YTC-OFFP-FD02-072622

Lab Sample ID: 410-93099-6

Date Collected: 07/26/22 00:00

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	86		70 - 130	08/05/22 07:35	08/15/22 21:26	1
13C2 PFHxA	87		70 - 130	08/05/22 07:35	08/15/22 21:26	1
13C3 HFPO-DA	78		70 - 130	08/05/22 07:35	08/15/22 21:26	1
d5-NEtFOSAA	74		70 - 130	08/05/22 07:35	08/15/22 21:26	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
Perfluorooctanesulfonic acid	<1.3	H M	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
NEtFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
NMeFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
HFPODA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
9CI-PF3ONS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
11CI-PF3OUdS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1
DONA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	105		70 - 130	08/17/22 11:16	08/24/22 01:35	1
13C2 PFHxA	99		70 - 130	08/17/22 11:16	08/24/22 01:35	1
13C3 HFPO-DA	95		70 - 130	08/17/22 11:16	08/24/22 01:35	1
d5-NEtFOSAA	105		70 - 130	08/17/22 11:16	08/24/22 01:35	1

Client Sample ID: YTC-OFFP-251-DW-072622

Lab Sample ID: 410-93099-7

Date Collected: 07/26/22 15:03

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:03	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:03	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:03	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:03	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:03	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:03	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:03	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:03	1
Perfluorohexanesulfonic acid	<1.3	*-en UJ	1.7	1.3	0.42	ng/L		08/11/22 18:03	1
Perfluorooctanesulfonic acid	<1.3	*-en	1.7	1.3	0.42	ng/L		08/11/22 18:03	1
NEtFOSAA	<1.3	*-en	1.7	1.3	0.42	ng/L		08/11/22 18:03	1
NMeFOSAA	<1.3	*-en	1.7	1.3	0.42	ng/L		08/11/22 18:03	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:03	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93099-1

Client Sample ID: YTC-OFFP-251-DW-072622

Lab Sample ID: 410-93099-7

Date Collected: 07/26/22 15:03

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:03	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:03	1
9CI-PF3ONS	<1.3	*-cn UJ	1.7	1.3	0.42	ng/L		08/11/22 18:03	1
11CI-PF3OUdS	<1.3	*-cn UJ	1.7	1.3	0.42	ng/L		08/11/22 18:03	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	84		70 - 130	08/05/22 07:35	08/11/22 18:03	1
13C2 PFHxA	81		70 - 130	08/05/22 07:35	08/11/22 18:03	1
13C3 HFPO-DA	71		70 - 130	08/05/22 07:35	08/11/22 18:03	1
d5-NEtFOSAA	75		70 - 130	08/05/22 07:35	08/11/22 18:03	1

~~**Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE**~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
NEtFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
NMeFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
HFPODA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
9CI-PF3ONS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
11CI-PF3OUdS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1
DONA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 01:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130	08/17/22 11:16	08/24/22 01:47	1
13C2 PFHxA	94		70 - 130	08/17/22 11:16	08/24/22 01:47	1
13C3 HFPO-DA	90		70 - 130	08/17/22 11:16	08/24/22 01:47	1
d5-NEtFOSAA	89		70 - 130	08/17/22 11:16	08/24/22 01:47	1

Client Sample ID: YTC-OFFP-264-DW-072622

Lab Sample ID: 410-93099-8

Date Collected: 07/26/22 14:18

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	8.3		1.7	1.3	0.42	ng/L		08/11/22 18:14	1
Perfluoroheptanoic acid	2.7		1.7	1.3	0.42	ng/L		08/11/22 18:14	1
Perfluorooctanoic acid	4.1		1.7	1.3	0.42	ng/L		08/11/22 18:14	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:14	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:14	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:14	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93099-1

Client Sample ID: YTC-OFFP-264-DW-072622

Lab Sample ID: 410-93099-8

Date Collected: 07/26/22 14:18

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:14	1
Perfluorobutanesulfonic acid	4.3		1.7	1.3	0.42	ng/L		08/11/22 18:14	1
Perfluorohexanesulfonic acid	18	*-cn J-	1.7	1.3	0.42	ng/L		08/11/22 18:14	1
Perfluorooctanesulfonic acid	7.0	*-M-cn J-	1.7	1.3	0.42	ng/L		08/11/22 18:14	1
NEtFOSAA	<1.3	*-cn UJ	1.7	1.3	0.42	ng/L		08/11/22 18:14	1
NMeFOSAA	<1.3	*-cn UJ	1.7	1.3	0.42	ng/L		08/11/22 18:14	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:14	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:14	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:14	1
9Cl-PF3ONS	<1.3	*-cn UJ	1.7	1.3	0.42	ng/L		08/11/22 18:14	1
11Cl-PF3OUdS	<1.3	*-cn UJ	1.7	1.3	0.42	ng/L		08/11/22 18:14	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 18:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	86		70 - 130	08/05/22 07:35	08/11/22 18:14	1
13C2 PFHxA	86		70 - 130	08/05/22 07:35	08/11/22 18:14	1
13C3 HFPO-DA	82		70 - 130	08/05/22 07:35	08/11/22 18:14	1
d5-NEtFOSAA	80		70 - 130	08/05/22 07:35	08/11/22 18:14	1

~~**Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE**~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	8.9	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
Perfluoroheptanoic acid	3.1	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
Perfluorooctanoic acid	4.6	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
Perfluorononanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
Perfluorodecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
Perfluorotridecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
Perfluorotetradecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
Perfluorobutanesulfonic acid	5.5	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
Perfluorohexanesulfonic acid	23	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
Perfluorooctanesulfonic acid	9.4	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
NEtFOSAA	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
NMeFOSAA	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
Perfluoroundecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
Perfluorododecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
HFPODA	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
9Cl-PF3ONS	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
11Cl-PF3OUdS	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1
DONA	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 01:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130	08/17/22 11:16	08/24/22 01:58	1
13C2 PFHxA	98		70 - 130	08/17/22 11:16	08/24/22 01:58	1
13C3 HFPO-DA	93		70 - 130	08/17/22 11:16	08/24/22 01:58	1
d5-NEtFOSAA	91		70 - 130	08/17/22 11:16	08/24/22 01:58	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93099-1

Client Sample ID: YTC-OFFP-138-DW-072622

Lab Sample ID: 410-93099-9

Date Collected: 07/26/22 09:28

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/15/22 21:38	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/15/22 21:38	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/15/22 21:38	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/15/22 21:38	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/15/22 21:38	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/15/22 21:38	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/15/22 21:38	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/15/22 21:38	1
Perfluorohexanesulfonic acid	<1.3	*-cn UJ	1.7	1.3	0.44	ng/L		08/15/22 21:38	1
Perfluorooctanesulfonic acid	<1.3	*-cn	1.7	1.3	0.44	ng/L		08/15/22 21:38	1
NEtFOSAA	<1.3	*-cn	1.7	1.3	0.44	ng/L		08/15/22 21:38	1
NMeFOSAA	<1.3	*-cn	1.7	1.3	0.44	ng/L		08/15/22 21:38	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/15/22 21:38	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/15/22 21:38	1
HFPODA	<1.3		1.7	1.3	0.44	ng/L		08/15/22 21:38	1
9CI-PF3ONS	<1.3	*-cn UJ	1.7	1.3	0.44	ng/L		08/15/22 21:38	1
11CI-PF3OUdS	<1.3	*-cn UJ	1.7	1.3	0.44	ng/L		08/15/22 21:38	1
DONA	<1.3		1.7	1.3	0.44	ng/L		08/15/22 21:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130	08/05/22 07:35	08/15/22 21:38	1
13C2 PFHxA	91		70 - 130	08/05/22 07:35	08/15/22 21:38	1
13C3 HFPO-DA	78		70 - 130	08/05/22 07:35	08/15/22 21:38	1
d5-NEtFOSAA	74		70 - 130	08/05/22 07:35	08/15/22 21:38	1

~~**Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE**~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
Perfluoroheptanoic acid	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
Perfluorooctanoic acid	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
Perfluorononanoic acid	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
Perfluorodecanoic acid	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
Perfluorotridecanoic acid	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
Perfluorotetradecanoic acid	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
Perfluorobutanesulfonic acid	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
Perfluorohexanesulfonic acid	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
Perfluorooctanesulfonic acid	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
NEtFOSAA	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
NMeFOSAA	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
Perfluoroundecanoic acid	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
Perfluorododecanoic acid	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
HFPODA	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
9CI-PF3ONS	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
11CI-PF3OUdS	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1
DONA	<1.4	H	1.8	1.4	0.45	ng/L		08/24/22 02:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	96		70 - 130	08/17/22 11:16	08/24/22 02:10	1
13C2 PFHxA	97		70 - 130	08/17/22 11:16	08/24/22 02:10	1
13C3 HFPO-DA	92		70 - 130	08/17/22 11:16	08/24/22 02:10	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93099-1

Client Sample ID: YTC-OFFP-138-DW-072622

Lab Sample ID: 410-93099-9

Date Collected: 07/26/22 09:28

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	96		70 - 130	08/17/22 11:16	08/24/22 02:10	1

Client Sample ID: YTC-OFFP-257-DW-072622

Lab Sample ID: 410-93099-10

Date Collected: 07/26/22 13:44

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	UJ	1.7	1.3	0.44	ng/L		08/11/22 18:37	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 18:37	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 18:37	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 18:37	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 18:37	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 18:37	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 18:37	1
Perfluorobutanesulfonic acid	1.1	J	1.7	1.3	0.44	ng/L		08/11/22 18:37	1
Perfluorohexanesulfonic acid	4.1	*-cn	1.7	1.3	0.44	ng/L		08/11/22 18:37	1
Perfluorooctanesulfonic acid	<1.3	*-en	1.7	1.3	0.44	ng/L		08/11/22 18:37	1
NEtFOSAA	<1.3	*-en	1.7	1.3	0.44	ng/L		08/11/22 18:37	1
NMeFOSAA	<1.3	*-cn	1.7	1.3	0.44	ng/L		08/11/22 18:37	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 18:37	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 18:37	1
HFPODA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 18:37	1
9CI-PF3ONS	<1.3	*-cn	1.7	1.3	0.44	ng/L		08/11/22 18:37	1
11CI-PF3OUdS	<1.3	*-en	1.7	1.3	0.44	ng/L		08/11/22 18:37	1
DONA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 18:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	79		70 - 130	08/05/22 07:35	08/11/22 18:37	1
13C2 PFHxA	75		70 - 130	08/05/22 07:35	08/11/22 18:37	1
13C3 HFPO-DA	67	S1- cn	70 - 130	08/05/22 07:35	08/11/22 18:37	1
d5-NEtFOSAA	66	S1- cn	70 - 130	08/05/22 07:35	08/11/22 18:37	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
Perfluorobutanesulfonic acid	1.4	J H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
Perfluorohexanesulfonic acid	5.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
Perfluorooctanesulfonic acid	0.47	J H M	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
NEtFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
NMeFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
HFPODA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93099-1

Client Sample ID: YTC-OFFP-257-DW-072622

Lab Sample ID: 410-93099-10

Date Collected: 07/26/22 13:44

Matrix: Drinking Water

Date Received: 08/02/22 10:32

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
9CI-PF3ONS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
11CI-PF3OUdS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1
DONA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 02:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	105		70 - 130	08/17/22 11:16	08/24/22 02:21	1
13C2 PFHxA	101		70 - 130	08/17/22 11:16	08/24/22 02:21	1
13C3 HFPO-DA	92		70 - 130	08/17/22 11:16	08/24/22 02:21	1
d5-NEtFOSAA	97		70 - 130	08/17/22 11:16	08/24/22 02:21	1

Client Sample ID: YTC-OFFP-137-DW-072622

Lab Sample ID: 410-93099-11

Date Collected: 07/26/22 10:15

Matrix: Drinking Water

Date Received: 08/02/22 10:32

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/15/22 22:01	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/15/22 22:01	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/15/22 22:01	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/15/22 22:01	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/15/22 22:01	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/15/22 22:01	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/15/22 22:01	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/15/22 22:01	1
Perfluorohexanesulfonic acid	<1.3	*cn UJ	1.8	1.3	0.44	ng/L		08/15/22 22:01	1
Perfluorooctanesulfonic acid	<1.3	*cn UJ	1.8	1.3	0.44	ng/L		08/15/22 22:01	1
NEtFOSAA	<1.3	*cn UJ	1.8	1.3	0.44	ng/L		08/15/22 22:01	1
NMeFOSAA	<1.3	*cn UJ	1.8	1.3	0.44	ng/L		08/15/22 22:01	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/15/22 22:01	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/15/22 22:01	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/15/22 22:01	1
9CI-PF3ONS	<1.3	*cn UJ	1.8	1.3	0.44	ng/L		08/15/22 22:01	1
11CI-PF3OUdS	<1.3	*cn UJ	1.8	1.3	0.44	ng/L		08/15/22 22:01	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/15/22 22:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	90		70 - 130	08/05/22 07:35	08/15/22 22:01	1
13C2 PFHxA	88		70 - 130	08/05/22 07:35	08/15/22 22:01	1
13C3 HFPO-DA	73		70 - 130	08/05/22 07:35	08/15/22 22:01	1
d5-NEtFOSAA	75		70 - 130	08/05/22 07:35	08/15/22 22:01	1

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
Perfluoroheptanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
Perfluorooctanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
Perfluorononanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
Perfluorodecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
Perfluorotridecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
Perfluorotetradecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
Perfluorobutanesulfonic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93099-1

Client Sample ID: YTC-OFFP-137-DW-072622

Lab Sample ID: 410-93099-11

Date Collected: 07/26/22 10:15

Matrix: Drinking Water

Date Received: 08/02/22 10:32

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
Perfluorooctanesulfonic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
NEtFOSAA	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
NMeFOSAA	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
Perfluoroundecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
Perfluorododecanoic acid	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
HFPODA	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
9Cl-PF3ONS	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
11Cl-PF3OUdS	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
DONA	<1.3	H	1.8	1.3	0.44	ng/L		08/24/22 02:33	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130				08/17/22 11:16	08/24/22 02:33	1
13C2 PFHxA	95		70 - 130				08/17/22 11:16	08/24/22 02:33	1
13C3 HFPO-DA	89		70 - 130				08/17/22 11:16	08/24/22 02:33	1
65 NEtFOSAA	91		70 - 130				08/17/22 11:16	08/24/22 02:33	1

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #410-93105-1

Analyses Performed By:
Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report #46632

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93105-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-147-DW-072922	410-93105-1	Drinking Water	07/29/2022		X
YTC-OFFP-188-DW-072922	410-93105-2	Drinking Water	07/29/2022		X
YTC-OFFP-189-DW-072922	410-93105-3	Drinking Water	07/29/2022		X
YTC-OFFP-193-DW-072922	410-93105-4	Drinking Water	07/29/2022		X
YTC-OFFP-195-DW-072922	410-93105-5	Drinking Water	07/29/2022		X
YTC-OFFP-196-DW-072922	410-93105-6	Drinking Water	07/29/2022		X
YTC-OFFP-199-DW-072922	410-93105-7	Drinking Water	07/29/2022		X
YTC-OFFP-201-DW-072922	410-93105-8	Drinking Water	07/29/2022		X
YTC-OFFP-203-DW-072922	410-93105-9	Drinking Water	07/29/2022		X
YTC-OFFP-FD-05-DW-072922	410-93105-10	Drinking Water	07/29/2022	YTC-OFFP-203-DW-072922	X
YTC-OFFP-206-DW-072922	410-93105-11	Drinking Water	07/29/2022		X
YTC-OFFP-205-DW-072922	410-93105-12	Drinking Water	07/29/2022		X
YTC-OFFP-211-DW-072922	410-93105-13	Drinking Water	07/29/2022		X
YTC-OFFP-214-DW-072922	410-93105-14	Drinking Water	07/29/2022		X
YTC-OFFP-216-DW-072922	410-93105-15	Drinking Water	07/29/2022		X
YTC-OFFP-243-DW-072922	410-93105-16	Drinking Water	07/29/2022		X
YTC-OFFP-268-DW-072922	410-93105-17	Drinking Water	07/29/2022		X
YTC-OFFP-267-DW-072922	410-93105-18	Drinking Water	07/29/2022		X

Note:

1. Stage 4 validation was performed on sample locations YTC-OFFP-214-DW-072922 and YTC-OFFP-268-DW-072922.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location YTC-OFFP-203-DW-072922.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Yakima, Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance was acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

DATA REVIEW REPORT

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in EPA method 537 version 2.0 Table 4.

The ion transitions were as specified in EPA method 537 version 2.0 Table 4.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

DATA REVIEW REPORT

Results for field duplicate samples were non-detects in both the parent and field duplicate samples. Results for the parent sample and field duplicate sample were acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Note a number of results were manually integrated which were spot checked. The manual quantitation (M) laboratory qualifier has been preserved with the data as informational data for the end user; there was no impact on the data usability. The manual quantitation (M) laboratory qualifier associated with data reported as non-detect have been removed.

10. System Performance and Overall Assessment

The case narrative noted the lack of a field reagent blank. The associated sample results are not affected. Hence the "cn" qualifier can be ignored since the qualifiers impact to the data has been accessed and the qualifier has been removed in the database.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate Standard %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Moisture Content	X				X
Stage 3/4 Validation					
System performance check		X		X	
Initial calibration %RSD/%R		X		X	
Continuing calibration %R/%D		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
D. Transcription/calculations acceptable		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Sharon Pennington, Arcadis

SIGNATURE:



DATE: 08/29/2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: 8/29/2022

Tier 3
PFAS Calibration Standards %D

SDG #: J93105
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/28/2022
 Page: 1
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

PFOS, 08/22/2022 Calibration Instrument 24743

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	36828	2062931	28.68	0.017852	1.105838	1.1787	0.434379	0.463	-6.182	-6.1	MATCH
0.926	75488	2038494	28.68	0.037031	1.146929	1.1787	0.901041	0.926	-2.695	-2.6	MATCH
2.31	222953	2092767	28.68	0.106535	1.322695	1.1787	2.592199	2.31	12.216	12	MATCH
4.63	400256	2108407	28.68	0.189838	1.17593	1.1787	4.61912	4.63	-0.235	-0.2	MATCH
18.5	1554219	2067450	28.68	0.751757	1.165426	1.1787	18.29166	18.5	-1.126	-1.2	MATCH
Avg RF					1.183364	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

PFOS, 08/21/2022 Calibration Instrument 30730

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	125753	6620001	28.68	0.018996	1.17668	1.2217	0.445938	0.463	-3.685	-3.6	MATCH
0.926	242837	6495796	28.68	0.037384	1.157846	1.2217	0.877601	0.926	-5.227	-5.2	MATCH
2.31	699823	6669652	28.68	0.104926	1.302723	1.2217	2.4632	2.31	6.632	6.5	MATCH
4.63	1347449	6681587	28.68	0.201666	1.249197	1.2217	4.734207	4.63	2.251	2.3	MATCH
18.5	5057870	6482024	28.68	0.780292	1.209663	1.2217	18.31773	18.5	-0.985	-1	MATCH
Avg RF					1.219222	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: J93105
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/28/2022
 Page: 2
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

ICV 410-288402/8 8/22/2022 13:49 Instrument 24743 Page: 402

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D
PFHxS	204406	2104409	28.68	0.0971323	1.2693	2.194716	2.36	-7.00	-7.2
PFOS	188987	2104409	28.68	0.0898053	1.1787	2.185132	2.39	-8.57	-8.6
PFOA	578534	2138516	10	0.2705306	1.0912	2.479203	2.5	-0.83	-0.8

Match
Match
Match

CCVIS 410-288765/87, 08/24/2022, 05:49 Instrument 24743 Page: 416

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D
PFHxS	229836	2208269	28.68	0.1040797	1.2693	2.351695	2.28	3.14	3.1
PFOS	227613	2208269	28.68	0.103073	1.1787	2.507962	2.31	8.57	8.4
PFOA	673180	2315650	10	0.2907089	1.0912	2.664121	2.5	6.56	6.6

Match
Match
Match

ICV 410-288165/8 8/21/2022 23:16 Instrument 30730 Page: 442

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D
PFHxS	740873	6542872	28.68	0.1132336	1.4493	2.240764	2.36	-5.05	-5.2
PFOS	605966	6542872	28.68	0.0926147	1.2217	2.174175	2.39	-9.03	-9.0
PFOA	1531509	5818216	10	0.2632266	1.0054	2.618128	2.5	4.73	4.7

Match
Match
Match

CCVIS 410-288233/11, 08/22/2022, 09:50 Instrument 30730 Page: 461

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D
PFHxS	835221	6706236	28.68	0.1245439	1.4493	2.464583	2.28	8.10	8.1
PFOS	706258	6706236	28.68	0.1053136	1.2217	2.472288	2.31	7.03	6.9
PFOA	1694183	6050229	10	0.2800196	1.0054	2.785157	2.5	11.41	11.4

Match
Match
Match

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS LCS

SDG #: J93105
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/28/2022
Page: 3
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

LCS ID **LCS 410-285400/2-A**
ANALYTE PFOS
REPORTED LCS %R 87
REPORTED LCSD %R NA
REPORTED RPD NA

Page 106

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration 16.6
LCSD Concentration _____
LCS TV 19
LCSD TV _____

LCS %R 87.37 MATCH

LCS ID **LCS 410-285182/2-A**
ANALYTE PFOS
REPORTED LCS %R 94
REPORTED LCSD %R NA
REPORTED RPD NA

Page 107

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration 17.9
LCSD Concentration _____
LCS TV 19
LCSD TV _____

LCS %R 94.21 MATCH

Tier 3
PFAS MS/MSD

SDG #: J93105
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/28/2022
Page: 4
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

MS/MSD Sample ID YTC-OFFP-203-DW-072922

Pages 108 & 109

ANALYTE	PFOS
REPORTED MS %R	89
REPORTED MSD %R	90
REPORTED RPD	4

$$\%R = \frac{100 * \text{MS Concentration}}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * | \text{MS \%R} - \text{MSD \%R} |}{\text{Average of MS MSD \%R}}$$

Sample Concentration	<u>0</u>
MS Concentration	<u>14.4</u>
MSD Concentration	<u>15.0</u>
MS TV	<u>16.1</u>
MSD TV	<u>16.6</u>

MS %R	<u>89.44</u> MATCH
MSD %R	<u>90.36</u> MATCH
RPD	<u>4.08</u> MATCH

Tier 3
PFAS Sample Concentration

SDG #: J93105
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/28/2022
 Page: 5
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-214-DW-072922 Lab ID: 410-93105-14 Analyzed: 08/22/22 14:16 Page 213

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFOA	1671233	6151065	10	0.271698	1.0054	2.70	1	284.1	9.51	9.5
PFBS	1258360	7653743	28.68	0.164411	1.5969	2.95	1	284.1	10.39	10
PFHxS	6815935	7653743	28.68	0.890536	1.4493	17.62	1	284.1	62.03	62
PFOS	3855910	7653743	28.68	0.503794	1.2217	11.83	1	284.1	41.63	42

Match
Match
Match
Match

Sample ID: YTC-OFFP-268-DW-072922 Lab ID: 410-93105-17 Analyzed: 08/24/22 10:02 Page 235

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFHxA	511923	2403341	10	0.213005	1.0835	1.97	1	293.8	6.69	6.7
PFOA	239117	2403341	10	0.099494	1.0912	0.91	1	293.8	3.10	3.1
PFBS	102845	2427046	28.68	0.042375	1.311	0.93	1	293.8	3.16	3.2
PFOS	325930	2427046	28.68	0.134291	1.1787	3.27	1	293.8	11.12	11

Match
Match
Match
Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: J93092
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/17/2022
Page: 6
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-214-DW-072922 Lab ID: 410-93105-14

Surrogate d5-NEtFOSAA
REPORTED %R 86

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 34.5 Page 215
Surrogate TV 40.0 Page 317
%R 86.3 MATCH

Sample ID: YTC-OFFP-268-DW-072922 Lab ID: 410-93105-17

Surrogate d5-NEtFOSAA
REPORTED %R 93

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 37.2 Page 237
Surrogate TV 40.0 Page 252
%R 93.0 MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS





Chain of Custody Record

410-93105 Chain of Custody

Client Contact: Andrew Kopchynski		Sampler <i>Andrew Kopchynski</i>		Lab PM Gordon, Stephen J		Camera Tracking No(s)		COC No 410-61650-17570 16			
Company Seres Engineering & Services LLC		Phone <i>(631) 316-4206</i>		E-Mail Stephen.Gordon@et.eurofinsus.com		State of Origin <i>WA</i>		Page 1 of 28			
Address 669 Marina Drive Suite B7		Due Date Requested:		Analysis Requested		Job # <i>30059933</i>		Preservation Codes:			
City Charleston		TAT Requested (days): <i>Normal</i>		637.1_DW - DW EPA 637.1 List of 18		A - HCL		M - Hexane			
State, Zip SC, 29492		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No				B - NaOH		N - None		O - AsNaO2	
Phone 720-344-3712(Tel)		PO # D18-218 PFAS PA/SI				C - Zn Acetate		P - Na2O4S		Q - Na2SO3	
Email afkopchynski@seres-es.com		WC # 3005993.YTC00				D - Nitric Acid		R - Na2S2O3		S - H2SO4	
Project Name Yakima Training Center (YTC)		Project # 41011531				E - NaHSO4		T - TSP Dodecahydrate		U - Acetone	
Site		SSOW#		F - MeOH		V - MCAA		W - pH 4-5			
				G - Amchlor		X - EDTA		Y - Trizma			
				H - Ascorbic Acid		Z - other (specify)		Other:			
				I - Ice							
				J - DI Water							
				K - EDTA							
				L - EDA							
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=soil, BT=Tissue, A=Air)	Special Instructions/Note:					
YTC-OFFP-147-DW-072922	07/29/22	1010	G	Drinking Water	W	N	2				
YTC-OFFP-188-DW-072922		0954	G	Drinking Water	W	N	2				
YTC-OFFP-189-DW-072922		0910	G	Drinking Water	W	N	2				
YTC-OFFP-193-DW-072922		0943	G	Drinking Water	W	N	2				
YTC-OFFP-195-DW-072922		0924	G	Drinking Water	W	N	2				
YTC-OFFP-196-DW-072922		1034	G	Drinking Water	W	N	2				
YTC-OFFP-199-DW-072922		1053	G	Drinking Water	W	N	2				
YTC-OFFP-201-DW-072922		1254	G	Drinking Water	W	N	2				
YTC-OFFP-203-DW-072922		1116	G	Drinking Water	W	Y	6	MS/MSD			
YTC-OFFP-FD-05-DW-072922		1200	G	Drinking Water	W	N	2				
YTC-OFFP-206-DW-072922		1133	G	Drinking Water	W	N	2				
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological				Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months							
Deliverable Requested: I, II, III, IV, Other (specify)				Special Instructions/QC Requirements:							
Empty Kit Relinquished by		Date:		Time:		Method of Shipment					
Relinquished by <i>Ben Mc</i>		Date/Time 07/29/22 1641		Company <i>ERIS</i>		Received by		Date/Time			
Relinquished by		Date/Time		Company		Received by		Date/Time			
Relinquished by		Date/Time		Company		Received by <i>EA</i>		Date/Time 8/2/22 10:37			
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: <i>5-6</i>							

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 410-93105-1

Login Number: 93105

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 1

Creator: Bryan, Debra A

Question	Answer	Comment
The cooler's custody seal is intact.	True	
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 ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	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	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	Not present.
VOA sample vials do not have headspace $>6\text{mm}$ in diameter (none, if from WV)?	N/A	

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93105-1

Client Sample ID: YTC-OFFP-147-DW-072922

Lab Sample ID: 410-93105-1

Date Collected: 07/29/22 10:10

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
HFPODA	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1
DONA	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100	cn	70 - 130	08/11/22 11:18	08/22/22 11:11	1
13C2 PFHxA	93	cn	70 - 130	08/11/22 11:18	08/22/22 11:11	1
13C3 HFPO-DA	99	cn	70 - 130	08/11/22 11:18	08/22/22 11:11	1
d5-NEtFOSAA	86	cn	70 - 130	08/11/22 11:18	08/22/22 11:11	1

Client Sample ID: YTC-OFFP-188-DW-072922

Lab Sample ID: 410-93105-2

Date Collected: 07/29/22 09:54

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
HFPODA	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1
DONA	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 11:23	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93105-1

Client Sample ID: YTC-OFFP-188-DW-072922

Lab Sample ID: 410-93105-2

Date Collected: 07/29/22 09:54

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99	cn	70 - 130	08/11/22 11:18	08/22/22 11:23	1
13C2 PFHxA	92	cn	70 - 130	08/11/22 11:18	08/22/22 11:23	1
13C3 HFPO-DA	97	cn	70 - 130	08/11/22 11:18	08/22/22 11:23	1
d5-NEtFOSAA	82	cn	70 - 130	08/11/22 11:18	08/22/22 11:23	1

Client Sample ID: YTC-OFFP-189-DW-072922

Lab Sample ID: 410-93105-3

Date Collected: 07/29/22 09:10

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
Perfluoroheptanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
Perfluorooctanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
Perfluorononanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
Perfluorobutanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
Perfluorohexanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
Perfluorooctanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
HFPODA	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
9Cl-PF3ONS	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
11Cl-PF3OUdS	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1
DONA	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 11:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101	cn	70 - 130	08/11/22 11:18	08/22/22 11:34	1
13C2 PFHxA	89	cn	70 - 130	08/11/22 11:18	08/22/22 11:34	1
13C3 HFPO-DA	90	cn	70 - 130	08/11/22 11:18	08/22/22 11:34	1
d5-NEtFOSAA	85	cn	70 - 130	08/11/22 11:18	08/22/22 11:34	1

Client Sample ID: YTC-OFFP-193-DW-072922

Lab Sample ID: 410-93105-4

Date Collected: 07/29/22 09:43

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
Perfluorobutanesulfonic acid	0.88	J cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
Perfluorohexanesulfonic acid	1.7	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93105-1

Client Sample ID: YTC-OFFP-193-DW-072922

Lab Sample ID: 410-93105-4

Date Collected: 07/29/22 09:43

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 11:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	97	cn	70 - 130	08/11/22 11:18	08/22/22 11:46	1
13C2 PFHxA	94	cn	70 - 130	08/11/22 11:18	08/22/22 11:46	1
13C3 HFPO-DA	99	cn	70 - 130	08/11/22 11:18	08/22/22 11:46	1
d5-NEtFOSAA	83	cn	70 - 130	08/11/22 11:18	08/22/22 11:46	1

Client Sample ID: YTC-OFFP-195-DW-072922

Lab Sample ID: 410-93105-5

Date Collected: 07/29/22 09:24

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
Perfluoroheptanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
Perfluorooctanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
Perfluorononanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
Perfluorodecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
Perfluorotridecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
Perfluorotetradecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
Perfluorobutanesulfonic acid	0.80	J cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
Perfluorohexanesulfonic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
Perfluorooctanesulfonic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
NEtFOSAA	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
NMeFOSAA	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
Perfluoroundecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
Perfluorododecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
HFPODA	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
9Cl-PF3ONS	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
11Cl-PF3OUdS	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1
DONA	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 11:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	104	cn	70 - 130	08/11/22 11:18	08/22/22 11:57	1
13C2 PFHxA	93	cn	70 - 130	08/11/22 11:18	08/22/22 11:57	1
13C3 HFPO-DA	102	cn	70 - 130	08/11/22 11:18	08/22/22 11:57	1
d5-NEtFOSAA	88	cn	70 - 130	08/11/22 11:18	08/22/22 11:57	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93105-1

Client Sample ID: YTC-OFFP-196-DW-072922

Lab Sample ID: 410-93105-6

Date Collected: 07/29/22 10:34

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
HFPODA	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1
DONA	<1.3	cn	1.7	1.3	0.43	ng/L		08/22/22 12:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101	cn	70 - 130	08/11/22 11:18	08/22/22 12:09	1
13C2 PFHxA	89	cn	70 - 130	08/11/22 11:18	08/22/22 12:09	1
13C3 HFPO-DA	95	cn	70 - 130	08/11/22 11:18	08/22/22 12:09	1
d5-NEtFOSAA	83	cn	70 - 130	08/11/22 11:18	08/22/22 12:09	1

Client Sample ID: YTC-OFFP-199-DW-072922

Lab Sample ID: 410-93105-7

Date Collected: 07/29/22 10:53

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
Perfluoroheptanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
Perfluorooctanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
Perfluorononanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
Perfluorodecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
Perfluorotridecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
Perfluorotetradecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
Perfluorobutanesulfonic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
Perfluorohexanesulfonic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
Perfluorooctanesulfonic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
NEtFOSAA	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
NMeFOSAA	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
Perfluoroundecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
Perfluorododecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
HFPODA	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
9Cl-PF3ONS	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
11Cl-PF3OUdS	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1
DONA	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 12:21	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93105-1

Client Sample ID: YTC-OFFP-199-DW-072922

Lab Sample ID: 410-93105-7

Date Collected: 07/29/22 10:53

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102	cn	70 - 130	08/11/22 11:18	08/22/22 12:21	1
13C2 PFHxA	93	cn	70 - 130	08/11/22 11:18	08/22/22 12:21	1
13C3 HFPO-DA	102	cn	70 - 130	08/11/22 11:18	08/22/22 12:21	1
d5-NEtFOSAA	83	cn	70 - 130	08/11/22 11:18	08/22/22 12:21	1

Client Sample ID: YTC-OFFP-201-DW-072922

Lab Sample ID: 410-93105-8

Date Collected: 07/29/22 12:54

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 12:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101	cn	70 - 130	08/11/22 11:18	08/22/22 12:44	1
13C2 PFHxA	96	cn	70 - 130	08/11/22 11:18	08/22/22 12:44	1
13C3 HFPO-DA	104	cn	70 - 130	08/11/22 11:18	08/22/22 12:44	1
d5-NEtFOSAA	84	cn	70 - 130	08/11/22 11:18	08/22/22 12:44	1

Client Sample ID: YTC-OFFP-203-DW-072922

Lab Sample ID: 410-93105-9

Date Collected: 07/29/22 11:16

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
Perfluoroheptanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
Perfluorooctanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
Perfluorononanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
Perfluorodecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
Perfluorotridecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
Perfluorotetradecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
Perfluorobutanesulfonic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
Perfluorohexanesulfonic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93105-1

Client Sample ID: YTC-OFFP-203-DW-072922

Lab Sample ID: 410-93105-9

Date Collected: 07/29/22 11:16

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
NEtFOSAA	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
NMeFOSAA	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
Perfluoroundecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
Perfluorododecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
HFPODA	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
9Cl-PF3ONS	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
11Cl-PF3OUdS	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1
DONA	<1.2	cn	1.7	1.2	0.42	ng/L		08/22/22 12:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103	cn	70 - 130	08/11/22 11:18	08/22/22 12:55	1
13C2 PFHxA	93	cn	70 - 130	08/11/22 11:18	08/22/22 12:55	1
13C3 HFPO-DA	99	cn	70 - 130	08/11/22 11:18	08/22/22 12:55	1
d5-NEtFOSAA	84	cn	70 - 130	08/11/22 11:18	08/22/22 12:55	1

Client Sample ID: YTC-OFFP-FD-05-DW-072922

Lab Sample ID: 410-93105-10

Date Collected: 07/29/22 12:00

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
Perfluoroheptanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
Perfluorooctanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
Perfluorononanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
Perfluorobutanesulfonic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
Perfluorohexanesulfonic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
Perfluorooctanesulfonic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
HFPODA	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
9Cl-PF3ONS	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
11Cl-PF3OUdS	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1
DONA	<1.3	cn	1.8	1.3	0.45	ng/L		08/22/22 13:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103	cn	70 - 130	08/11/22 11:18	08/22/22 13:30	1
13C2 PFHxA	92	cn	70 - 130	08/11/22 11:18	08/22/22 13:30	1
13C3 HFPO-DA	101	cn	70 - 130	08/11/22 11:18	08/22/22 13:30	1
d5-NEtFOSAA	83	cn	70 - 130	08/11/22 11:18	08/22/22 13:30	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93105-1

Client Sample ID: YTC-OFFP-206-DW-072922

Lab Sample ID: 410-93105-11

Date Collected: 07/29/22 11:33

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101	cn	70 - 130	08/11/22 11:18	08/22/22 13:42	1
13C2 PFHxA	95	cn	70 - 130	08/11/22 11:18	08/22/22 13:42	1
13C3 HFPO-DA	104	cn	70 - 130	08/11/22 11:18	08/22/22 13:42	1
d5-NEtFOSAA	86	cn	70 - 130	08/11/22 11:18	08/22/22 13:42	1

Client Sample ID: YTC-OFFP-205-DW-072922

Lab Sample ID: 410-93105-12

Date Collected: 07/29/22 16:02

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/22/22 13:53	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93105-1

Client Sample ID: YTC-OFFP-205-DW-072922

Lab Sample ID: 410-93105-12

Date Collected: 07/29/22 16:02

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	105	cn	70 - 130	08/11/22 11:18	08/22/22 13:53	1
13C2 PFHxA	93	cn	70 - 130	08/11/22 11:18	08/22/22 13:53	1
13C3 HFPO-DA	102	cn	70 - 130	08/11/22 11:18	08/22/22 13:53	1
d5-NEtFOSAA	92	cn	70 - 130	08/11/22 11:18	08/22/22 13:53	1

Client Sample ID: YTC-OFFP-211-DW-072922

Lab Sample ID: 410-93105-13

Date Collected: 07/29/22 14:56

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
Perfluoroheptanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
Perfluorooctanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
Perfluorononanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
Perfluorodecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
Perfluorotridecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
Perfluorotetradecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
Perfluorobutanesulfonic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
Perfluorohexanesulfonic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
Perfluorooctanesulfonic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
NEtFOSAA	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
NMeFOSAA	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
Perfluoroundecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
Perfluorododecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
HFPODA	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
9Cl-PF3ONS	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
11Cl-PF3OUdS	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1
DONA	<1.2	cn	1.6	1.2	0.41	ng/L		08/22/22 14:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	97	cn	70 - 130	08/11/22 11:18	08/22/22 14:05	1
13C2 PFHxA	91	cn	70 - 130	08/11/22 11:18	08/22/22 14:05	1
13C3 HFPO-DA	95	cn	70 - 130	08/11/22 11:18	08/22/22 14:05	1
d5-NEtFOSAA	86	cn	70 - 130	08/11/22 11:18	08/22/22 14:05	1

Client Sample ID: YTC-OFFP-214-DW-072922

Lab Sample ID: 410-93105-14

Date Collected: 07/29/22 15:17

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	14	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
Perfluoroheptanoic acid	5.7	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
Perfluorooctanoic acid	9.5	M cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
Perfluorononanoic acid	0.65	J cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
Perfluorobutanesulfonic acid	10	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
Perfluorohexanesulfonic acid	62	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93105-1

Client Sample ID: YTC-OFFP-214-DW-072922

Lab Sample ID: 410-93105-14

Date Collected: 07/29/22 15:17

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	42	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
HFPODA	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
9Cl-PF3ONS	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
11Cl-PF3OUdS	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1
DONA	<1.3	cn	1.8	1.3	0.44	ng/L		08/22/22 14:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103	cn	70 - 130	08/11/22 11:18	08/22/22 14:16	1
13C2 PFHxA	91	cn	70 - 130	08/11/22 11:18	08/22/22 14:16	1
13C3 HFPO-DA	94	cn	70 - 130	08/11/22 11:18	08/22/22 14:16	1
d5-NEtFOSAA	86	cn	70 - 130	08/11/22 11:18	08/22/22 14:16	1

Client Sample ID: YTC-OFFP-216-DW-072922

Lab Sample ID: 410-93105-15

Date Collected: 07/29/22 15:40

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
Perfluoroheptanoic acid	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
Perfluorooctanoic acid	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
Perfluorononanoic acid	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
Perfluorodecanoic acid	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
Perfluorotridecanoic acid	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
Perfluorotetradecanoic acid	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
Perfluorobutanesulfonic acid	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
Perfluorohexanesulfonic acid	1.6	J cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
Perfluorooctanesulfonic acid	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
NEtFOSAA	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
NMeFOSAA	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
Perfluoroundecanoic acid	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
Perfluorododecanoic acid	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
HFPODA	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
9Cl-PF3ONS	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
11Cl-PF3OUdS	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1
DONA	<1.4	cn	1.9	1.4	0.46	ng/L		08/22/22 14:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	104	cn	70 - 130	08/11/22 11:18	08/22/22 14:28	1
13C2 PFHxA	96	cn	70 - 130	08/11/22 11:18	08/22/22 14:28	1
13C3 HFPO-DA	104	cn	70 - 130	08/11/22 11:18	08/22/22 14:28	1
d5-NEtFOSAA	85	cn	70 - 130	08/11/22 11:18	08/22/22 14:28	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93105-1

Client Sample ID: YTC-OFFP-243-DW-072922

Lab Sample ID: 410-93105-16

Date Collected: 07/29/22 14:09

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
Perfluoroheptanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
Perfluorooctanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
Perfluorononanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
Perfluorobutanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
Perfluorohexanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
Perfluorooctanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
HFPODA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
9Cl-PF3ONS	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
11Cl-PF3OUdS	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1
DONA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 09:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	105	cn	70 - 130	08/11/22 14:49	08/24/22 09:51	1
13C2 PFHxA	98	cn	70 - 130	08/11/22 14:49	08/24/22 09:51	1
13C3 HFPO-DA	95	cn	70 - 130	08/11/22 14:49	08/24/22 09:51	1
d5-NEtFOSAA	102	cn	70 - 130	08/11/22 14:49	08/24/22 09:51	1

Client Sample ID: YTC-OFFP-268-DW-072922

Lab Sample ID: 410-93105-17

Date Collected: 07/29/22 13:44

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	6.7	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
Perfluoroheptanoic acid	2.3	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
Perfluorooctanoic acid	3.1	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
Perfluorobutanesulfonic acid	3.2	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
Perfluorohexanesulfonic acid	18	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
Perfluorooctanesulfonic acid	11	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
HFPODA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1
DONA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 10:02	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93105-1

Client Sample ID: YTC-OFFP-268-DW-072922

Lab Sample ID: 410-93105-17

Date Collected: 07/29/22 13:44

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	107	cn	70 - 130	08/11/22 14:49	08/24/22 10:02	1
13C2 PFHxA	97	cn	70 - 130	08/11/22 14:49	08/24/22 10:02	1
13C3 HFPO-DA	94	cn	70 - 130	08/11/22 14:49	08/24/22 10:02	1
d5-NEtFOSAA	93	cn	70 - 130	08/11/22 14:49	08/24/22 10:02	1

Client Sample ID: YTC-OFFP-267-DW-072922

Lab Sample ID: 410-93105-18

Date Collected: 07/29/22 13:18

Matrix: Drinking Water

Date Received: 08/02/22 10:37

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	2.1	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
Perfluoroheptanoic acid	0.83	J cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
Perfluorooctanoic acid	1.4	J cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
Perfluorononanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
Perfluorobutanesulfonic acid	1.5	J cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
Perfluorohexanesulfonic acid	5.5	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
Perfluorooctanesulfonic acid	1.3	J M cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
HFPODA	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
9Cl-PF3ONS	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
11Cl-PF3OUdS	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1
DONA	<1.3	cn	1.8	1.3	0.45	ng/L		08/24/22 10:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102	cn	70 - 130	08/11/22 14:49	08/24/22 10:14	1
13C2 PFHxA	99	cn	70 - 130	08/11/22 14:49	08/24/22 10:14	1
13C3 HFPO-DA	94	cn	70 - 130	08/11/22 14:49	08/24/22 10:14	1
d5-NEtFOSAA	92	cn	70 - 130	08/11/22 14:49	08/24/22 10:14	1

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #410-93111-1

Analyses Performed By:
Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report #46635R
Review Level: Stage 3/4
Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93111-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-163-DW-072722	410-93111-1	Drinking Water	07/27/2022		X
YTC-OFFP-156-DW-072722	410-93111-2	Drinking Water	07/27/2022		X
YTC-OFFP-162-DW-072722	410-93111-3	Drinking Water	07/27/2022		X
YTC-OFFP-238-DW-072722	410-93111-4	Drinking Water	07/27/2022		X
YTC-OFFP-FD-03-DW-072722	410-93111-5	Drinking Water	07/27/2022	YTC-OFFP-163-DW-072722	X
YTC-OFFP-227-DW-072722	410-93111-6	Drinking Water	07/27/2022		X
YTC-OFFP-281-DW-072722	410-93111-7	Drinking Water	07/27/2022		X
YTC-OFFP-152-DW-072722	410-93111-8	Drinking Water	07/27/2022		X
YTC-OFFP-153-DW-072722	410-93111-9	Drinking Water	07/27/2022		X
YTC-OFFP-164-DW-072722	410-93111-10	Drinking Water	07/27/2022		X
YTC-OFFP-300-DW-072722	410-93111-11	Drinking Water	07/27/2022		X
YTC-OFFP-165-DW-072722	410-93111-12	Drinking Water	07/27/2022		X
YTC-OFFP-319-DW-072722	410-93111-13	Drinking Water	07/27/2022		X
YTC-OFFP-166-DW-072722	410-93111-14	Drinking Water	07/27/2022		X
YTC-OFFP154-DW-072722	410-93111-15	Drinking Water	07/27/2022		X

Note:

1. Stage 3/4 validation was performed on sample location YTC-OFFP-300-DW-072722 and YTC-OFFP-281-DW-072722 RE.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location YTC-OFFP-163-DW-072722.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Yakima, Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

The samples were initially extracted and analyzed within the hold time.

The analyses that exceeded the holding time are presented in the following table.

Sample Locations	Holding Time	Criteria
YTC-OFFP-281-DW-072722 (410- 93111-7) RE	Extraction Completed 22 days from collection	< 14 days

Sample results associated with sample locations analyzed by analytical method USEPA method 537 version 2.0 were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed past holding time	J	UJ

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the DL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

DATA REVIEW REPORT

Sample Locations	Analytes	Sample Result	Qualification
YTC-OFFP-163-DW-072722 YTC-OFFP-156-DW-072722 YTC-OFFP-FD-03-DW-072722 YTC-OFFP-227-DW-072722 YTC-OFFP-153-DW-072722 YTC-OFFP-164-DW-072722 YTC-OFFP-165-DW-072722 YTC-OFFP-319-DW-072722 YTC-OFFP-166-DW-072722 YTC-OFFP-154-DW-072722	Perfluorooctanoic acid (PFOA) [MB]	Detected sample results <LOQ and <BAL	“UB” at the LOQ
YTC-OFFP-163-DW-072722 YTC-OFFP-156-DW-072722 YTC-OFFP-FD-03-DW-072722 YTC-OFFP-227-DW-072722 YTC-OFFP-153-DW-072722 YTC-OFFP-164-DW-072722 YTC-OFFP-165-DW-072722 YTC-OFFP-319-DW-072722 YTC-OFFP-166-DW-072722 YTC-OFFP-154-DW-072722	Prefluorohexanoic acid (PFHxA) [MB]	Detected sample results >LOQ and <BAL	J+ at the detected sample concentration
YTC-OFFP-162-DW-072722 YTC-OFFP-238-DW-072722 YTC-OFFP-152-DW-072722	Prefluorohexanoic acid (PFHxA) and Perfluorooctanoic acid (PFOA) [MB]	Detected sample results <LOQ and <BAL	“UB” at the detected sample concentration

Note:

LOQ Limit of quantitation

MB Method blank

Note: All samples except YTC-OFFP-300-DW-072722 were re-extracted outside holding time due to method blank contamination. However, the samples exhibited similar concentrations of compounds found in the method blank. Using professional judgement, original sample analyses with the exception of sample YTC-OFFP-281-DW-072722 are reportable with qualification of compounds found in the method blank. Sample YTC-OFFP-281-DW-072722 is reported from the re-extraction due to blank contamination in the initial analysis, and detections for the affected compounds in the re-extracted analysis.

3. System Performance

System performance was acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

DATA REVIEW REPORT

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in EPA method 537 version 2.0 Table 4.

The ion transitions were as specified in EPA method 537 version 2.0 Table 4.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

Sample locations associated with surrogate exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Surrogate	%R	RE %R
YTC-OFFP-162-DW-072722	d5-NEtFOSAA	< 70% but > 10%	AC

Note:

AC Acceptable

Where a re-extracted analysis was performed, results are reported from the analysis in bold above.

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
< 70% but > 10%	Non-detect	UJ
	Detect	J-

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

DATA REVIEW REPORT

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
YTC-OFFP-163-DW-072722/ YTC-OFFP-FD-03-DW-072722	Perfluorohexanoic acid	1.9	2.2	AC
	Perfluorooctanoic acid	1.1 J	1.2 J	
	Perfluorobutanesulfonic acid	0.9 J	0.82 J	
	Perfluorohexanesulfonic acid	1.4 J	1.3 J	
	Perfluorooctanesulfonic acid	0.49 J	0.47 J	

Notes:

AC Acceptable

The calculated results between the parent sample and field duplicate were acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with a compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

DATA REVIEW REPORT

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-300-DW-072722	Perfluorohexanesulfonic acid (PFHxS)	--	140 D	140 D

Note: The laboratory did not report the original analysis, only the diluted result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range.	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range.	EDJ
Original sample result greater than the calibration range	EJ

10. System Performance and Overall Assessment

The case narrative notes that YTC-OFFP-153-DW-072722 (410-9311-9) was found to have residual chlorine, though the sample was preserved with trizma and the pH was 7. Since residual chlorine can affect the efficiency of the extraction, all results for sample YTC-OFFP-153-DW-072722 were qualified as estimated; J for detected and UJ for undetected results.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X	X		
B. Equipment blanks	X				X
C. Field blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate Standard %R		X	X		
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Moisture Content	X				X
Stage 3/4 Validation					
System performance check		X		X	
Initial calibration %RSD/%R		X		X	
Continuing calibration %R/%D		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
D. Transcription/calculations acceptable		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Sharon Pennington, Arcadis

SIGNATURE:



DATE: 08/30/2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: 8/31/2022

Tier 3
PFAS Calibration Standards %D

SDG #: J93111
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/30/2022
 Page: 1
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

PFOS, 08/09/2022 Calibration Instrument 24743 Calibration ID: 41612 Page 388

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	42395	2265344	28.68	0.018715	1.159254	1.2296	0.436512	0.463	-5.721	-5.7	MATCH
0.926	84531	2421541	28.68	0.034908	1.081166	1.2296	0.814216	0.926	-12.072	-12	MATCH
2.31	238357	2341122	28.68	0.101813	1.26407	1.2296	2.374757	2.31	2.803	2.6	MATCH
4.63	450354	2354240	28.68	0.191295	1.184954	1.2296	4.461887	4.63	-3.631	-3.6	MATCH
18.5	1725997	2146817	28.68	0.80398	1.246386	1.2296	18.75255	18.5	1.365	1.3	MATCH
Avg RF					1.187166	No Match					

PFOS, 08/15/2022 Calibration Instrument 24743 Calibration ID: 41726 Page 452

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	40522	2343719	28.7	0.01729	1.071732	1.2431	0.399173	0.463	-13.786	-13.8	MATCH
0.926	84332	2272090	28.7	0.037116	1.150371	1.2431	0.856925	0.926	-7.460	-7.5	MATCH
2.31	252534	2386019	28.7	0.105839	1.31497	1.2431	2.443553	2.31	5.782	5.5	MATCH
4.63	474684	2313129	28.7	0.205213	1.272054	1.2431	4.737842	4.63	2.329	2.3	MATCH
18.5	1824120	2286170	28.7	0.797893	1.237813	1.2431	18.42132	18.5	-0.425	-0.6	MATCH
Avg RF					1.209388	No Match					

PFHxS, 08/23/2022 Calibration Instrument 30730 Calibration ID: 41812 Page 516

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.456	143957	6785222	28.68	0.021216	1.334391	1.4328	0.42468	0.456	-6.868	-6.9	MATCH
0.912	297916	6802456	28.68	0.043795	1.377249	1.4328	0.876641	0.912	-3.877	-3.9	MATCH
2.28	876042	7206929	28.68	0.121556	1.52904	1.4328	2.433146	2.28	6.717	6.7	MATCH
4.56	1559621	6697583	28.68	0.232863	1.464587	1.4328	4.661166	4.56	2.219	2.2	MATCH
18.2	5843721	6479491	28.68	0.90188	1.421204	1.4328	18.0527	18.2	-0.809	-1	MATCH
Avg RF					1.425294	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

Concentration ng/ml = (Peak area ratio/slope) x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: J93111
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/30/2022
 Page: 2
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

ICVL 410-284153/8 8/9/2022 12:43 Instrument 24743 Page 591

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	201950	2359543	28.68	0.085589	1.1925	2.058433	2.21	-6.86	-6.9	Match
PFHxS	221993	2359543	28.68	0.094083	1.2059	2.237583	2.36	-5.19	-5.3	Match
PFOS	204025	2359543	28.68	0.086468	1.2296	2.016837	2.39	-15.61	-15.6	Match
PFOA	832893	3249413	10	0.256321	1.045	2.452833	2.5	-1.89	-1.9	Match

CCVLIS 410-284721/1, 08/10/2022, 15:23 Instrument 24743 Page 603

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	1492728	2065410	28.68	0.722727	1.1925	17.38182	17.7	-1.80	-1.8	Match
PFHxS	1607465	2065410	28.68	0.778279	1.2059	18.50986	18.2	1.70	1.5	Match
PFOS	1582355	2065410	28.68	0.766121	1.2296	17.86952	18.5	-3.41	-3.5	Match
PFOA	5673369	2886189	10	1.965696	1.045	18.81048	20	-5.95	-6	Match

ICV 410-288402/8 8/22/2022 13:49 Instrument 24743 Page: 638

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	199884	2299974	28.7	0.086907	1.149	2.170786	2.21	-1.77	-1.9	Match
PFHxS	239945	2299974	28.7	0.104325	1.2814	2.336609	2.36	-0.99	-1.2	Match
PFOS	200903	2299974	28.7	0.08735	1.2431	2.016691	2.39	-15.62	-15.7	Match
PFOA	812363	2956886	10	0.274736	1.0499	2.616782	2.5	4.67	4.7	Match

CCVLIS 410-286100/1, 08/15/2022, 20:05 Instrument 24743 Page: 644

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFHxS	36991	2278513	28.7	0.016235	1.149	0.405515	0.443	-8.46	-8.4	Match
PFHxS	42718	2278513	28.7	0.018748	1.2814	0.41991	0.456	-7.91	-8	Match
PFOS	43679	2278513	28.7	0.01917	1.2431	0.442585	0.463	-4.41	-4.4	Match
PFOA	149230	2982888	10	0.050029	1.0499	0.476509	0.5	-4.70	-4.7	Match

ICV 410-288773/8 8/23/2022 16:25:00 PM Instrument 30730 Page: 663

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	894725	6959168	28.7	0.128568	1.6133	2.287173	2.21	3.49	3.4	Match
PFHxS	789271	6959168	28.7	0.113415	1.4328	2.271774	2.36	-3.74	-4	Match
PFOS	669991	6959168	28.7	0.096275	1.2324	2.242032	2.39	-6.19	-6.3	Match
PFOA	1572814	5227752	10	0.300859	1.1471	2.622775	2.5	4.91	4.9	Match

CCVLIS 410-288829/56, 08/24/2022, 05:12 Instrument 30730 Page: 675

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	967554	7258641	28.7	0.133297	1.6133	2.371301	2.21	7.30	7.1	Match
PFHxS	867619	7258641	28.7	0.119529	1.4328	2.394253	2.28	5.01	4.9	Match
PFOS	780173	7258641	28.7	0.107482	1.2324	2.503029	2.31	8.36	8.1	Match
PFOA	1773634	5963896	10	0.297395	1.1471	2.592583	2.5	3.70	3.7	Match

Tier 3
PFAS LCS

SDG #: J93111
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/30/2022
Page: 3
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

LCS ID	<u>LCS 410-283849/2-A</u>
ANALYTE	<u>PFOS</u>
REPORTED LCS %R	<u>85</u>
REPORTED LCSD %R	<u>--</u>
REPORTED RPD	<u>--</u>

Page: 123

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration	<u>62.8</u>
LCSD Concentration	<u>--</u>
LCS TV	<u>74</u>
LCSD TV	<u>--</u>

LCS %R	84.86 MATCH
LCSD %R	
RPD	

LCS ID	<u>LCS 410-287360/2-A</u>
ANALYTE	<u>PFOS</u>
REPORTED LCS %R	<u>89</u>
REPORTED LCSD %R	<u>--</u>
REPORTED RPD	<u>--</u>

Page: 124

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration	<u>66</u>
LCSD Concentration	<u>--</u>
LCS TV	<u>74</u>
LCSD TV	<u>--</u>

LCS %R	89.19 MATCH
LCSD %R	
RPD	

Tier 3
PFAS MS/MSD

SDG #: J93111
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/30/2022
Page: 4
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

MS/MSD Sample ID: YTC-OFFP-163-DW-072722
ANALYTE PFOS
REPORTED MS %R 85
REPORTED MSD %R 84
REPORTED RPD 1

$$\%R = \frac{100 * \text{MS Concentration}}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * | \text{MS \%R} - \text{MSD \%R} |}{\text{Average of MS MSD \%R}}$$

Sample Concentration 0.49
MS Concentration 55
MSD Concentration 54.4
MS TV 64.2
MSD TV 64.2

MS %R 84.91 MATCH
MSD %R 83.97 MATCH
RPD 1.10 MATCH

Tier 3
PFAS Sample Concentration

SDG #: J93111
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/30/2022
 Page: 5
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0 YTC-OFFP-300-DW-072722 and YTC-OFFP-281-DW-072722

Sample ID: YTC-OFFP-281-DW-72722 RE Lab ID: 410-93111-7 RE Page 242 Instrument: 30730
 Analyzed: 8/24/2022 07:30

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxA	851768	5714299	10	0.149059	0.977	1.53	1	294.3	5.18	5.2	Match
PFHpA	353333	5714299	10	0.061833	1.136	0.54	1	294.3	1.85	1.8	Match
PFOA	595066	5714299	10	0.104136	1.147	0.91	1	294.3	3.08	3.1	Match
PFBS	379222	7453791	28.68	0.050876	1.613	0.90	1	294.3	3.07	3.1	Match
PFHxS	1608303	7453791	28.68	0.21577	1.433	4.32	1	294.3	14.67	15	Match
PFOS	812996	7453791	28.68	0.109071	1.232	2.54	1	294.3	8.63	8.6	Match

Sample ID: YTC-OFFP-300-DW-72722 Lab ID: 410-93111-11 Page 309 Instrument: 24743
 Analyzed: 08/11/2022 00:25

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxA	3545112	2930055	10	1.209913	0.9163	13.20	1	307	43.01	43	Match
PFHpA	1017137	2930055	10	0.347139	0.7422	4.68	1	307	15.24	15	Match
PFOA	2214689	2930055	10	0.755852	1.045	7.23	1	307	23.56	24	Match
PFNA	82559	2930055	10	0.028177	0.648	0.43	1	307	1.42	1.4	Match
PFBS	879159	2260383	28.68	0.388942	1.1925	9.35	1	307	30.47	30	Match
PFOS	1601753	2260383	28.68	0.70862	1.2296	16.53	1	307	53.84	54	Match

Sample ID: YTC-OFFP-300-DW-72722 DL Lab ID: 410-93111-11 DL Page 317 Instrument: 24743
 Dilution Factor = 10 Analyzed: 08/15/2022 20:17

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxS	480977	2487948	28.7	0.193323	1.2814	4.33	1	307	141.04	140	Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)
 Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: J93111
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/30/2022
Page: 6
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Sample ID: **YTC-OFFP-162-DW-072722** Lab ID: 410-93111-3 Page: 181

Surrogate 13C2 PFHxA
REPORTED %R 94

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 9.42
Surrogate TV 10.0
%R 94.2 MATCH

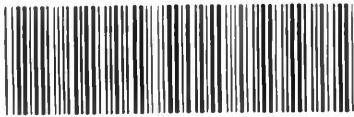
Sample ID: **YTC-OFFP-154-DW-072722** Lab ID: 410-93111-15 Page: 378

Surrogate d5-NEtFOSAA
REPORTED %R 86

Found Concentration 34.3
Surrogate TV 40.0
%R 85.8 MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS





Chain of Custody Record

410-93111 Chain of Custody

Sampler Andrew Kopchynski		Lab PM Gordon, Stephen J		Camera Tracking No(s)		COC No 410-61650-17570 12			
Phone (631) 316-4206		E-Mail Stephen.Gordon@et.eurofinsus.com		State of Origin WA		Page 1 of 2 Page 2 of 2			
Company Seres Engineering & Services LLC		PWSID		Analysis Requested				Job # 30059933	
Address 669 Marina Drive Suite B7		Due Date Requested:		637.1_DW - DW EPA 637.1 List of 18				Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Y - Trizma Z - other (specify)	
City Charleston		TAT Requested (days): Normal							
State, Zip SC, 29492		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No							
Phone 720-344-3712(Tel)		PO # D18-218 PFAS PA/SI							
Email afkopchynski@seres-es.com		WO # 3005993.YTC00							
Project Name Yakima Training Center (YTC)		Project # 41011531							
Site		SSOW#:						Other:	
Sample Identification		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Water, Solid, Other, BT=Tissue, A=Air)	Initial Number		Special Instructions/Note:	
YTC-OFFP-163-DU-072722		07/27/22	1137	G	Drinking Water	N	Y	6	MS/MSD
YTC-OFFP-156-DW-072722		07/27/22	0949	G	Drinking Water	N	N	2	
YTC-OFFP-162-DW-072722		07/27/22	1126	G	Drinking Water	N	N	2	
YTC-OFFP-238-DW-072722		07/27/22	1342	G	Drinking Water	N	N	2	
YTC-OFFP-FD-03-DW-072722		07/27/22	1200	G	Drinking Water	N	N	2	
YTC-OFFP-227-DW-072722		07/27/22	1126	G	Drinking Water	N	N	2	
YTC-OFFP-281-DW-072722		07/27/22	1510	G	Drinking Water	N	N	2	
YTC-OFFP-152-DW-072722		07/27/22	0913	G	Drinking Water	N	N	2	
YTC-OFFP-153-DW-072722		07/27/22	1015	G	Drinking Water	N	N	2	
YTC-OFFP-164-DW-072722		07/27/22	1047	G	Drinking Water	N	N	2	
YTC-OFFP-300-DW-072722		07/27/22	1415	G	Drinking Water	N	N	2	
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Deliverable Requested: I, II, III, IV, Other (specify)						Special Instructions/QC Requirements:			
Empty Kit Relinquished by		Date:		Time:		Method of Shipment			
Relinquished by Ben Mc...		Date/Time: 07/28/22 1633		Company: Seres		Received by:		Date/Time	
Relinquished by		Date/Time		Company		Received by:		Date/Time	
Relinquished by		Date/Time		Company		Received by:		Date/Time	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 5.6					

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 410-93111-1

Login Number: 93111

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 1

Creator: Bryan, Debra A

Question	Answer	Comment
The cooler's custody seal is intact.	True	
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 ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	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	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace $>6\text{mm}$ in diameter (none, if from WV)?	True	

Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Qualifiers

LCMS

Qualifier	Qualifier Description
B	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
cn	Refer to Case Narrative for further detail
D	The reported value is from a dilution.
E	Result exceeded calibration range.
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
M	Manual integrated compound.
S1-	Surrogate recovery exceeds control limits, low biased.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
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

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-163-DW-072722

Lab Sample ID: 410-93111-1

Date Collected: 07/27/22 11:37

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.9	B-en J+	1.7	1.3	0.42	ng/L		08/10/22 21:55	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 21:55	1
Perfluorooctanoic acid	1.1	J-B-en 1.7 UB	1.7	1.3	0.42	ng/L		08/10/22 21:55	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 21:55	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 21:55	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 21:55	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 21:55	1
Perfluorobutanesulfonic acid	0.90	J	1.7	1.3	0.42	ng/L		08/10/22 21:55	1
Perfluorohexanesulfonic acid	1.4	J	1.7	1.3	0.42	ng/L		08/10/22 21:55	1
Perfluorooctanesulfonic acid	0.49	J	1.7	1.3	0.42	ng/L		08/10/22 21:55	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 21:55	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 21:55	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 21:55	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 21:55	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 21:55	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/10/22 21:55	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/10/22 21:55	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 21:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	95		70 - 130	08/08/22 12:42	08/10/22 21:55	1
13C2 PFHxA	103		70 - 130	08/08/22 12:42	08/10/22 21:55	1
13C3 HFPO-DA	97		70 - 130	08/08/22 12:42	08/10/22 21:55	1
d5-NEtFOSAA	74		70 - 130	08/08/22 12:42	08/10/22 21:55	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
Perfluorobutanesulfonic acid	0.95	J H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
Perfluorohexanesulfonic acid	1.3	J H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
Perfluorooctanesulfonic acid	0.49	J H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
NEtFOSAA	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
NMeFOSAA	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
HFPODA	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
9Cl-PF3ONS	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
11Cl-PF3OUdS	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1
DONA	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 05:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	96		70 - 130	08/18/22 09:57	08/24/22 05:58	1
13C2 PFHxA	98		70 - 130	08/18/22 09:57	08/24/22 05:58	1
13C3 HFPO-DA	93		70 - 130	08/18/22 09:57	08/24/22 05:58	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-163-DW-072722

Lab Sample ID: 410-93111-1

Date Collected: 07/27/22 11:37

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	87		70 - 130	08/18/22 09:57	08/24/22 05:58	1

Client Sample ID: YTC-OFFP-156-DW-072722

Lab Sample ID: 410-93111-2

Date Collected: 07/27/22 09:49

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.8	B cn J+	1.8	1.4	0.45	ng/L		08/10/22 22:30	1
Perfluoroheptanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
Perfluorooctanoic acid	0.86	J B M cn	1.8	1.4	0.45	ng/L		08/10/22 22:30	1
Perfluorononanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
Perfluorodecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
Perfluorotridecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
Perfluorotetradecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
Perfluorobutanesulfonic acid	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
Perfluorohexanesulfonic acid	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
Perfluorooctanesulfonic acid	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
NEtFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
NMeFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
Perfluoroundecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
Perfluorododecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
HFPODA	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
9Cl-PF3ONS	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
11Cl-PF3OUdS	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1
DONA	<1.4		1.8	1.4	0.45	ng/L		08/10/22 22:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99		70 - 130	08/08/22 12:42	08/10/22 22:30	1
13C2 PFHxA	103		70 - 130	08/08/22 12:42	08/10/22 22:30	1
13C3 HFPO-DA	98		70 - 130	08/08/22 12:42	08/10/22 22:30	1
d5-NEtFOSAA	87		70 - 130	08/08/22 12:42	08/10/22 22:30	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
NEtFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
NMeFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
HFPODA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-156-DW-072722

Lab Sample ID: 410-93111-2

Date Collected: 07/27/22 09:49

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
9CI-PF3ONS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
11CI-PF3OUdS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1
DONA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102		70 - 130	08/18/22 09:57	08/24/22 06:33	1
13C2 PFHxA	101		70 - 130	08/18/22 09:57	08/24/22 06:33	1
13C3 HFPO-DA	95		70 - 130	08/18/22 09:57	08/24/22 06:33	1
d5-NEtFOSAA	98		70 - 130	08/18/22 09:57	08/24/22 06:33	1

Client Sample ID: YTC-OFFP-162-DW-072722

Lab Sample ID: 410-93111-3

Date Collected: 07/27/22 11:26

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.5	J B cn	1.8 UB	1.8	1.3	0.45		08/10/22 22:42	1
Perfluoroheptanoic acid	<1.3		UJ	1.8	1.3	0.45		08/10/22 22:42	1
Perfluorooctanoic acid	0.86	J B cn	1.8 UB	1.8	1.3	0.45		08/10/22 22:42	1
Perfluorononanoic acid	<1.3		UJ	1.8	1.3	0.45		08/10/22 22:42	1
Perfluorodecanoic acid	<1.3			1.8	1.3	0.45		08/10/22 22:42	1
Perfluorotridecanoic acid	<1.3			1.8	1.3	0.45		08/10/22 22:42	1
Perfluorotetradecanoic acid	<1.3			1.8	1.3	0.45		08/10/22 22:42	1
Perfluorobutanesulfonic acid	<1.3			1.8	1.3	0.45		08/10/22 22:42	1
Perfluorohexanesulfonic acid	<1.3			1.8	1.3	0.45		08/10/22 22:42	1
Perfluorooctanesulfonic acid	<1.3			1.8	1.3	0.45		08/10/22 22:42	1
NEtFOSAA	<1.3			1.8	1.3	0.45		08/10/22 22:42	1
NMeFOSAA	<1.3			1.8	1.3	0.45		08/10/22 22:42	1
Perfluoroundecanoic acid	<1.3			1.8	1.3	0.45		08/10/22 22:42	1
Perfluorododecanoic acid	<1.3			1.8	1.3	0.45		08/10/22 22:42	1
HFPODA	<1.3			1.8	1.3	0.45		08/10/22 22:42	1
9CI-PF3ONS	<1.3			1.8	1.3	0.45		08/10/22 22:42	1
11CI-PF3OUdS	<1.3			1.8	1.3	0.45		08/10/22 22:42	1
DONA	<1.3			1.8	1.3	0.45		08/10/22 22:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	83		70 - 130	08/08/22 12:42	08/10/22 22:42	1
13C2 PFHxA	94		70 - 130	08/08/22 12:42	08/10/22 22:42	1
13C3 HFPO-DA	90		70 - 130	08/08/22 12:42	08/10/22 22:42	1
d5-NEtFOSAA	66	S1- cn	70 - 130	08/08/22 12:42	08/10/22 22:42	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-162-DW-072722

Lab Sample ID: 410-93111-3

Date Collected: 07/27/22 11:26

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
NEtFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
NMeFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
HFPODA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
9Cl-PF3ONS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
11Cl-PF3OUdS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1
DONA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 06:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	95		70 - 130	08/18/22 09:57	08/24/22 06:44	1
13C2 PFHxA	92		70 - 130	08/18/22 09:57	08/24/22 06:44	1
13C3 HFPO-DA	86		70 - 130	08/18/22 09:57	08/24/22 06:44	1
d5-NEtFOSAA	83		70 - 130	08/18/22 09:57	08/24/22 06:44	1

Client Sample ID: YTC-OFFP-238-DW-072722

Lab Sample ID: 410-93111-4

Date Collected: 07/27/22 13:42

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.5	J B cn	1.7 UB	1.7	1.3	0.42	ng/L	08/10/22 22:53	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
Perfluorooctanoic acid	0.90	J B cn	1.7 UB	1.7	1.3	0.42	ng/L	08/10/22 22:53	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 22:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103		70 - 130	08/08/22 12:42	08/10/22 22:53	1
13C2 PFHxA	103		70 - 130	08/08/22 12:42	08/10/22 22:53	1
13C3 HFPO-DA	97		70 - 130	08/08/22 12:42	08/10/22 22:53	1
d5-NEtFOSAA	88		70 - 130	08/08/22 12:42	08/10/22 22:53	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-238-DW-072722

Lab Sample ID: 410-93111-4

Date Collected: 07/27/22 13:42

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
NEtFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
NMeFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
HFPODA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
9Cl-PF3ONS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
11Cl-PF3OUdS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1
DONA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 06:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102		70 - 130	08/18/22 09:57	08/24/22 06:56	1
13C2 PFHxA	92		70 - 130	08/18/22 09:57	08/24/22 06:56	1
13C3 HFPO-DA	86		70 - 130	08/18/22 09:57	08/24/22 06:56	1
15-NEtFOSAA	90		70 - 130	08/18/22 09:57	08/24/22 06:56	1

Client Sample ID: YTC-OFFP-FD-03-DW-072722

Lab Sample ID: 410-93111-5

Date Collected: 07/27/22 12:00

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	2.2	B cn J+	1.8	1.3	0.45	ng/L		08/10/22 23:05	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/10/22 23:05	1
Perfluorooctanoic acid	1.2	J B M cn 1.8 UB	1.8	1.3	0.45	ng/L		08/10/22 23:05	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/10/22 23:05	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/10/22 23:05	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/10/22 23:05	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/10/22 23:05	1
Perfluorobutanesulfonic acid	0.82	J	1.8	1.3	0.45	ng/L		08/10/22 23:05	1
Perfluorohexanesulfonic acid	1.3	J	1.8	1.3	0.45	ng/L		08/10/22 23:05	1
Perfluorooctanesulfonic acid	0.47	J	1.8	1.3	0.45	ng/L		08/10/22 23:05	1
NEtFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/10/22 23:05	1
NMeFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/10/22 23:05	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/10/22 23:05	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/10/22 23:05	1
HFPODA	<1.3		1.8	1.3	0.45	ng/L		08/10/22 23:05	1
9Cl-PF3ONS	<1.3		1.8	1.3	0.45	ng/L		08/10/22 23:05	1
11Cl-PF3OUdS	<1.3		1.8	1.3	0.45	ng/L		08/10/22 23:05	1
DONA	<1.3		1.8	1.3	0.45	ng/L		08/10/22 23:05	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-FD-03-DW-072722

Lab Sample ID: 410-93111-5

Date Collected: 07/27/22 12:00

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	98		70 - 130	08/08/22 12:42	08/10/22 23:05	1
13C2 PFHxA	100		70 - 130	08/08/22 12:42	08/10/22 23:05	1
13C3 HFPO-DA	98		70 - 130	08/08/22 12:42	08/10/22 23:05	1
d5-NEtFOSAA	91		70 - 130	08/08/22 12:42	08/10/22 23:05	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
Perfluorobutanesulfonic acid	0.89	J H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
Perfluorohexanesulfonic acid	1.3	J H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
Perfluorooctanesulfonic acid	0.48	J H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
NEtFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
NMeFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
HFPODA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
9Cl-PF3ONS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
11Cl-PF3OUdS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1
DONA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	98		70 - 130	08/18/22 09:57	08/24/22 07:07	1
13C2 PFHxA	93		70 - 130	08/18/22 09:57	08/24/22 07:07	1
13C3 HFPO-DA	88		70 - 130	08/18/22 09:57	08/24/22 07:07	1
d5-NEtFOSAA	85		70 - 130	08/18/22 09:57	08/24/22 07:07	1

Client Sample ID: YTC-OFFP-227-DW-072722

Lab Sample ID: 410-93111-6

Date Collected: 07/27/22 11:26

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	2.2	B-en J+	1.7	1.3	0.42	ng/L		08/10/22 23:16	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
Perfluorooctanoic acid	1.1	J B-cn 1.7 UB	1.7	1.3	0.42	ng/L		08/10/22 23:16	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-227-DW-072722

Lab Sample ID: 410-93111-6

Date Collected: 07/27/22 11:26

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	96		70 - 130	08/08/22 12:42	08/10/22 23:16	1
13C2 PFHxA	96		70 - 130	08/08/22 12:42	08/10/22 23:16	1
13C3 HFPO-DA	95		70 - 130	08/08/22 12:42	08/10/22 23:16	1
d5-NEtFOSAA	82		70 - 130	08/08/22 12:42	08/10/22 23:16	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
NEtFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
NMeFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
HFPODA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
9CI-PF3ONS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
11CI-PF3OUdS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1
DONA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 07:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130	08/18/22 09:57	08/24/22 07:19	1
13C2 PFHxA	95		70 - 130	08/18/22 09:57	08/24/22 07:19	1
13C3 HFPO-DA	94		70 - 130	08/18/22 09:57	08/24/22 07:19	1
d5-NEtFOSAA	93		70 - 130	08/18/22 09:57	08/24/22 07:19	1

Client Sample ID: YTC-OFFP-281-DW-072722

Lab Sample ID: 410-93111-7

Date Collected: 07/27/22 15:10

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	7.1	B cn	1.8	1.3	0.44	ng/L		08/10/22 23:28	1
Perfluoroheptanoic acid	1.8		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
Perfluorooctanoic acid	3.7	B M cn	1.8	1.3	0.44	ng/L		08/10/22 23:28	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/10/22 23:28	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-281-DW-072722

Lab Sample ID: 410-93111-7

Date Collected: 07/27/22 15:10

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
Perfluorobutanesulfonic acid	3.3		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
Perfluorohexanesulfonic acid	16		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
Perfluorooctanesulfonic acid	8.7 M		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
9Cl-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
11Cl-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/10/22 23:28	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/10/22 23:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	91		70 - 130	08/08/22 12:42	08/10/22 23:28	1
13C2 PFHxA	95		70 - 130	08/08/22 12:42	08/10/22 23:28	1
13C3 HFPO-DA	93		70 - 130	08/08/22 12:42	08/10/22 23:28	1
d5-NEtFOSAA	75		70 - 130	08/08/22 12:42	08/10/22 23:28	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	5.2	H-M J	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
Perfluoroheptanoic acid	1.8	H-M J	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
Perfluorooctanoic acid	3.1	H-M J	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
Perfluorononanoic acid	<1.3	H- UJ	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
Perfluorodecanoic acid	<1.3	H- ↓	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
Perfluorotridecanoic acid	<1.3	H- ↓	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
Perfluorotetradecanoic acid	<1.3	H- ↓	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
Perfluorobutanesulfonic acid	3.1	H-M J	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
Perfluorohexanesulfonic acid	15	H J	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
Perfluorooctanesulfonic acid	8.6	H J	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
NEtFOSAA	<1.3	H- UJ	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
NMeFOSAA	<1.3	H- ↓	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
Perfluoroundecanoic acid	<1.3	H- ↓	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
Perfluorododecanoic acid	<1.3	H- ↓	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
HFPODA	<1.3	H- ↓	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
9Cl-PF3ONS	<1.3	H- ↓	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
11Cl-PF3OUdS	<1.3	H- ↓	1.7	1.3	0.42	ng/L		08/24/22 07:30	1
DONA	<1.3	H- ↓	1.7	1.3	0.42	ng/L		08/24/22 07:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	96		70 - 130	08/18/22 09:57	08/24/22 07:30	1
13C2 PFHxA	96		70 - 130	08/18/22 09:57	08/24/22 07:30	1
13C3 HFPO-DA	90		70 - 130	08/18/22 09:57	08/24/22 07:30	1
d5-NEtFOSAA	91		70 - 130	08/18/22 09:57	08/24/22 07:30	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-152-DW-072722

Lab Sample ID: 410-93111-8

Date Collected: 07/27/22 09:13

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.6	J B cn 1.7 UB	1.7	1.3	0.42	ng/L		08/10/22 23:39	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
Perfluorooctanoic acid	0.83	J B M cn 1.7 UB	1.7	1.3	0.42	ng/L		08/10/22 23:39	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/10/22 23:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	95		70 - 130	08/08/22 12:42	08/10/22 23:39	1
13C2 PFHxA	97		70 - 130	08/08/22 12:42	08/10/22 23:39	1
13C3 HFPO-DA	94		70 - 130	08/08/22 12:42	08/10/22 23:39	1
d5-NEtFOSAA	81		70 - 130	08/08/22 12:42	08/10/22 23:39	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
Perfluorooctanesulfonic acid	<1.3	H M	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
NEtFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
NMeFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
HFPODA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
9Cl-PF3ONS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
11Cl-PF3OUdS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1
DONA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 07:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130	08/18/22 09:57	08/24/22 07:42	1
13C2 PFHxA	92		70 - 130	08/18/22 09:57	08/24/22 07:42	1
13C3 HFPO-DA	86		70 - 130	08/18/22 09:57	08/24/22 07:42	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-152-DW-072722

Lab Sample ID: 410-93111-8

Date Collected: 07/27/22 09:13

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	86		70 - 130	08/18/22 09:57	08/24/22 07:42	1

Client Sample ID: YTC-OFFP-153-DW-072722

Lab Sample ID: 410-93111-9

Date Collected: 07/27/22 10:15

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	3.4	B-en J+	1.7	1.3	0.44	ng/L		08/11/22 00:02	1
Perfluoroheptanoic acid	<1.3	UJ	1.7	1.3	0.44	ng/L		08/11/22 00:02	1
Perfluorooctanoic acid	1.1	J-B M-cn 1.7 UB	1.7	1.3	0.44	ng/L		08/11/22 00:02	1
Perfluorononanoic acid	<1.3	UJ	1.7	1.3	0.44	ng/L		08/11/22 00:02	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1
NEtFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1
NMeFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1
HFPODA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1
DONA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 00:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	87		70 - 130	08/08/22 12:42	08/11/22 00:02	1
13C2 PFHxA	95		70 - 130	08/08/22 12:42	08/11/22 00:02	1
13C3 HFPO-DA	95		70 - 130	08/08/22 12:42	08/11/22 00:02	1
d5-NEtFOSAA	74		70 - 130	08/08/22 12:42	08/11/22 00:02	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
Perfluoroheptanoic acid	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
Perfluorooctanoic acid	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
Perfluorononanoic acid	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
Perfluorodecanoic acid	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
Perfluorotridecanoic acid	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
Perfluorotetradecanoic acid	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
Perfluorobutanesulfonic acid	0.48	J H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
Perfluorohexanesulfonic acid	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
Perfluorooctanesulfonic acid	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
NEtFOSAA	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
NMeFOSAA	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
Perfluoroundecanoic acid	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
Perfluorododecanoic acid	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
HFPODA	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-153-DW-072722

Lab Sample ID: 410-93111-9

Date Collected: 07/27/22 10:15

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
9CI-PF3ONS	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
11CI-PF3OUdS	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1
DONA	<1.3	H cn	1.7	1.3	0.42	ng/L		08/24/22 08:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99	cn	70 - 130	08/18/22 09:57	08/24/22 08:05	1
13C2 PFHxA	101	cn	70 - 130	08/18/22 09:57	08/24/22 08:05	1
13C3 HFPO-DA	99	cn	70 - 130	08/18/22 09:57	08/24/22 08:05	1
d5-NEtFOSAA	100	cn	70 - 130	08/18/22 09:57	08/24/22 08:05	1

Client Sample ID: YTC-OFFP-164-DW-072722

Lab Sample ID: 410-93111-10

Date Collected: 07/27/22 10:47

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.7	B cn J+	1.7	1.3	0.42	ng/L		08/11/22 00:14	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 00:14	1
Perfluorooctanoic acid	0.79	J B M cn 1.7 UB	1.7	1.3	0.42	ng/L		08/11/22 00:14	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 00:14	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 00:14	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 00:14	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 00:14	1
Perfluorobutanesulfonic acid	1.3	J	1.7	1.3	0.42	ng/L		08/11/22 00:14	1
Perfluorohexanesulfonic acid	4.1		1.7	1.3	0.42	ng/L		08/11/22 00:14	1
Perfluorooctanesulfonic acid	1.2	J	1.7	1.3	0.42	ng/L		08/11/22 00:14	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 00:14	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 00:14	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 00:14	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 00:14	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 00:14	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/11/22 00:14	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/11/22 00:14	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 00:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	90		70 - 130	08/08/22 12:42	08/11/22 00:14	1
13C2 PFHxA	92		70 - 130	08/08/22 12:42	08/11/22 00:14	1
13C3 HFPO-DA	89		70 - 130	08/08/22 12:42	08/11/22 00:14	1
d5-NEtFOSAA	76		70 - 130	08/08/22 12:42	08/11/22 00:14	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
Perfluorooctanoic acid	<1.3	H M	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
Perfluorobutanesulfonic acid	1.4	J H M	1.7	1.3	0.43	ng/L		08/24/22 08:17	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-164-DW-072722

Lab Sample ID: 410-93111-10

Date Collected: 07/27/22 10:47

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	4.5	H M	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
Perfluorooctanesulfonic acid	1.4	J H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
NEtFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
NMeFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
HFPODA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
9Cl-PF3ONS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
11Cl-PF3OUdS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1
DONA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130	08/18/22 09:57	08/24/22 08:17	1
13C2 PFHxA	103		70 - 130	08/18/22 09:57	08/24/22 08:17	1
13C3 HFPO-DA	96		70 - 130	08/18/22 09:57	08/24/22 08:17	1
d5-NEtFOSAA	95		70 - 130	08/18/22 09:57	08/24/22 08:17	1

Client Sample ID: YTC-OFFP-300-DW-072722

Lab Sample ID: 410-93111-11

Date Collected: 07/27/22 14:15

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	43	B en	1.6	1.2	0.41	ng/L		08/11/22 00:25	1
Perfluoroheptanoic acid	15		1.6	1.2	0.41	ng/L		08/11/22 00:25	1
Perfluorooctanoic acid	24	B en	1.6	1.2	0.41	ng/L		08/11/22 00:25	1
Perfluorononanoic acid	1.4	J	1.6	1.2	0.41	ng/L		08/11/22 00:25	1
Perfluorodecanoic acid	<1.2		1.6	1.2	0.41	ng/L		08/11/22 00:25	1
Perfluorotridecanoic acid	<1.2		1.6	1.2	0.41	ng/L		08/11/22 00:25	1
Perfluorotetradecanoic acid	<1.2		1.6	1.2	0.41	ng/L		08/11/22 00:25	1
Perfluorobutanesulfonic acid	30		1.6	1.2	0.41	ng/L		08/11/22 00:25	1
Perfluorooctanesulfonic acid	54	M en	1.6	1.2	0.41	ng/L		08/11/22 00:25	1
NEtFOSAA	<1.2		1.6	1.2	0.41	ng/L		08/11/22 00:25	1
NMeFOSAA	<1.2		1.6	1.2	0.41	ng/L		08/11/22 00:25	1
Perfluoroundecanoic acid	<1.2		1.6	1.2	0.41	ng/L		08/11/22 00:25	1
Perfluorododecanoic acid	<1.2		1.6	1.2	0.41	ng/L		08/11/22 00:25	1
HFPODA	<1.2		1.6	1.2	0.41	ng/L		08/11/22 00:25	1
9Cl-PF3ONS	<1.2		1.6	1.2	0.41	ng/L		08/11/22 00:25	1
11Cl-PF3OUdS	<1.2		1.6	1.2	0.41	ng/L		08/11/22 00:25	1
DONA	<1.2		1.6	1.2	0.41	ng/L		08/11/22 00:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130	08/08/22 12:42	08/11/22 00:25	1
13C2 PFHxA	101		70 - 130	08/08/22 12:42	08/11/22 00:25	1
13C3 HFPO-DA	95		70 - 130	08/08/22 12:42	08/11/22 00:25	1
d5-NEtFOSAA	81		70 - 130	08/08/22 12:42	08/11/22 00:25	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	140	D	16	12	4.1	ng/L		08/15/22 20:17	10

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-300-DW-072722

Lab Sample ID: 410-93111-11

Date Collected: 07/27/22 14:15

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	95		70 - 130	08/08/22 12:42	08/15/22 20:17	10
13C2 PFHxA	93		70 - 130	08/08/22 12:42	08/15/22 20:17	10
13C3 HFPO-DA	96		70 - 130	08/08/22 12:42	08/15/22 20:17	10
d5-NEtFOSAA	88		70 - 130	08/08/22 12:42	08/15/22 20:17	10

Client Sample ID: YTC-OFFP-165-DW-072722

Lab Sample ID: 410-93111-12

Date Collected: 07/27/22 09:27

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.7	B.cn J+	1.7	1.3	0.43	ng/L		08/11/22 00:37	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
Perfluorooctanoic acid	1.1	J.B.cn 1.7 UB	1.7	1.3	0.43	ng/L		08/11/22 00:37	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 00:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130	08/08/22 12:42	08/11/22 00:37	1
13C2 PFHxA	97		70 - 130	08/08/22 12:42	08/11/22 00:37	1
13C3 HFPO-DA	97		70 - 130	08/08/22 12:42	08/11/22 00:37	1
d5-NEtFOSAA	89		70 - 130	08/08/22 12:42	08/11/22 00:37	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
NEtFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
NMeFOSAA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-165-DW-072722

Lab Sample ID: 410-93111-12

Date Collected: 07/27/22 09:27

Matrix: Drinking Water

Date Received: 08/02/22 10:30

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
HFPODA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
9CI-PF3ONS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
11CI-PF3OUdS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1
DONA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 08:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130	08/18/22 09:57	08/24/22 08:40	1
13C2 PFHxA	94		70 - 130	08/18/22 09:57	08/24/22 08:40	1
13C3 HFPO-DA	98		70 - 130	08/18/22 09:57	08/24/22 08:40	1
d5-NEtFOSAA	92		70 - 130	08/18/22 09:57	08/24/22 08:40	1

Client Sample ID: YTC-OFFP-319-DW-072722

Lab Sample ID: 410-93111-13

Date Collected: 07/27/22 17:10

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	2.1	B cn J+	1.9	1.4	0.47	ng/L		08/11/22 00:48	1
Perfluoroheptanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1
Perfluorooctanoic acid	1.0	J B cn 1.9 UB	1.9	1.4	0.47	ng/L		08/11/22 00:48	1
Perfluorononanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1
Perfluorodecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1
Perfluorotridecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1
Perfluorotetradecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1
Perfluorobutanesulfonic acid	0.94	J	1.9	1.4	0.47	ng/L		08/11/22 00:48	1
Perfluorohexanesulfonic acid	1.8	J	1.9	1.4	0.47	ng/L		08/11/22 00:48	1
Perfluorooctanesulfonic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1
NEtFOSAA	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1
NMeFOSAA	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1
Perfluoroundecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1
Perfluorododecanoic acid	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1
HFPODA	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1
9CI-PF3ONS	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1
11CI-PF3OUdS	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1
DONA	<1.4		1.9	1.4	0.47	ng/L		08/11/22 00:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	95		70 - 130	08/08/22 12:42	08/11/22 00:48	1
13C2 PFHxA	101		70 - 130	08/08/22 12:42	08/11/22 00:48	1
13C3 HFPO-DA	97		70 - 130	08/08/22 12:42	08/11/22 00:48	1
d5-NEtFOSAA	86		70 - 130	08/08/22 12:42	08/11/22 00:48	1

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
Perfluoroheptanoic acid	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
Perfluorooctanoic acid	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
Perfluorononanoic acid	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
Perfluorodecanoic acid	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
Perfluorotridecanoic acid	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-319-DW-072722

Lab Sample ID: 410-93111-13

Date Collected: 07/27/22 17:10

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorotetradecanoic acid	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
Perfluorobutanesulfonic acid	1.1	J H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
Perfluorohexanesulfonic acid	2.1	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
Perfluorooctanesulfonic acid	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
NEtFOSAA	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
NMeFOSAA	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
Perfluoroundecanoic acid	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
Perfluorododecanoic acid	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
HFPODA	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
9Cl-PF3ONS	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
11Cl-PF3OUdS	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1
DONA	<1.4	H	1.9	1.4	0.46	ng/L		08/24/22 08:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102		70 - 130	08/18/22 09:57	08/24/22 08:51	1
13C2 PFHxA	104		70 - 130	08/18/22 09:57	08/24/22 08:51	1
13C3 HFPO-DA	108		70 - 130	08/18/22 09:57	08/24/22 08:51	1
d5-NEtFOSAA	95		70 - 130	08/18/22 09:57	08/24/22 08:51	1

Client Sample ID: YTC-OFFP-166-DW-072722

Lab Sample ID: 410-93111-14

Date Collected: 07/27/22 13:10

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.8	B cn J+	1.7	1.3	0.42	ng/L		08/11/22 01:00	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
Perfluorooctanoic acid	0.84	J B cn 1.7 UB	1.7	1.3	0.42	ng/L		08/11/22 01:00	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/11/22 01:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	96		70 - 130	08/08/22 12:42	08/11/22 01:00	1
13C2 PFHxA	95		70 - 130	08/08/22 12:42	08/11/22 01:00	1
13C3 HFPO-DA	91		70 - 130	08/08/22 12:42	08/11/22 01:00	1
d5-NEtFOSAA	86		70 - 130	08/08/22 12:42	08/11/22 01:00	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP-166-DW-072722

Lab Sample ID: 410-93111-14

Date Collected: 07/27/22 13:10

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
NEtFOSAA	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
NMeFOSAA	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
HFPODA	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
9Cl-PF3ONS	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
11Cl-PF3OUdS	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1
DONA	<1.3	H	1.7	1.3	0.44	ng/L		08/24/22 09:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	108		70 - 130	08/18/22 09:57	08/24/22 09:03	1
13C2 PFHxA	102		70 - 130	08/18/22 09:57	08/24/22 09:03	1
13C3 HFPO-DA	102		70 - 130	08/18/22 09:57	08/24/22 09:03	1
d5-NEtFOSAA	105		70 - 130	08/18/22 09:57	08/24/22 09:03	1

Client Sample ID: YTC-OFFP154-DW-072722

Lab Sample ID: 410-93111-15

Date Collected: 07/27/22 10:30

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.9	B cn J+	1.7	1.3	0.43	ng/L		08/11/22 01:11	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
Perfluorooctanoic acid	0.95	J B cn 1.7 UB	1.7	1.3	0.43	ng/L		08/11/22 01:11	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
Perfluorobutanesulfonic acid	0.43	J	1.7	1.3	0.43	ng/L		08/11/22 01:11	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 01:11	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93111-1

Client Sample ID: YTC-OFFP154-DW-072722

Lab Sample ID: 410-93111-15

Date Collected: 07/27/22 10:30

Matrix: Drinking Water

Date Received: 08/02/22 10:30

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130	08/08/22 12:42	08/11/22 01:11	1
13C2 PFHxA	101		70 - 130	08/08/22 12:42	08/11/22 01:11	1
13C3 HFPO-DA	102		70 - 130	08/08/22 12:42	08/11/22 01:11	1
d5-NEtFOSAA	86		70 - 130	08/08/22 12:42	08/11/22 01:11	1

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
NEtFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
NMeFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
HFPODA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
9Cl-PF3ONS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
11Cl-PF3OUdS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1
DONA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130	08/18/22 09:57	08/24/22 09:15	1
13C2 PFHxA	97		70 - 130	08/18/22 09:57	08/24/22 09:15	1
13C3 HFPO-DA	93		70 - 130	08/18/22 09:57	08/24/22 09:15	1
d5-NEtFOSAA	91		70 - 130	08/18/22 09:57	08/24/22 09:15	1

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #410-93119-1

Analyses Performed By:
Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report #46676R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93119-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-151-DW-072722	410-93119-1	Drinking Water	07/27/2022		X
YTC-OFFP-155-DW-072722	410-93119-2	Drinking Water	07/27/2022		X
YTC-OFFP-150-DW-072722	410-93119-3	Drinking Water	07/27/2022		X
YTC-OFFP-148-DW-072722	410-93119-4	Drinking Water	07/27/2022		X
YTC-OFFP-45-DW-072622	410-93119-5	Drinking Water	07/26/2022		X
YTC-OFFP-167-DW-072622	410-93119-6	Drinking Water	07/26/2022		X
YTC-OFFP-140-DW-072622	410-93119-7	Drinking Water	07/26/2022		X
YTC-OFFP-128-DW-072722	410-93119-8	Drinking Water	07/27/2022		X
YTC-OFFP-141-DW-072622	410-93119-9	Drinking Water	07/26/2022		X
YTC-OFFP-200-DW-072622	410-93119-10	Drinking Water	07/26/2022		X
YTC-OFFP-144-DW-072622	410-93119-11	Drinking Water	07/26/2022		X
YTC-OFFP-FRB2-DW-072622	410-93119-12	Drinking Water	07/26/2022		X
YTC-OFFP-218-DW-072622	410-93119-13	Drinking Water	07/26/2022		X
YTC-OFFP-139-DW-072622	410-93119-14	Drinking Water	07/26/2022		X
YTC-OFFP-158-DW-072722	410-93119-15	Drinking Water	07/27/2022		X
YTC-OFFP-157-DW-072722	410-93119-16	Drinking Water	07/27/2022		X
YTC-OFFP-159-DW-072722	410-93119-17	Drinking Water	07/27/2022		X
YTC-OFFP-FRB3-DW-072722	410-93119-18	Drinking Water	07/27/2022		X
YTC-OFFP-313-DW-072722	410-93119-19	Drinking Water	07/27/2022		X
YTC-OFFP-318-DW-072722	410-93119-20	Drinking Water	07/27/2022		X

Note:

1. Stage 3/4 validation was performed on sample locations YTC-OFFP-200-DW-072622 and YTC-OFFP-218-DW-072622.

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2. A Matrix Spike/Matrix Spike Duplicate (MS/MSD) pair was not collected for a sample location associated with this SDG.

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ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X	X		
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X	X		
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

It was noted on the Sample Receipt Checklist that samples arrived where the labels did not match the COC. The date of collection for sample YTC-OFFP-148-DW-072722 (410-93119-4) was different on the sample label from the date on the Chain-of-Custody. The Chain-of-Custody date was determined to be the correct collection date and sample YTC-OFFP-148-DW-072722 was logged with the sample collection date per the Chain-of-Custody.

It was also noted on the Sample Receipt Checklist that the Field Sampler's name was not present on the Chain-of-Custody.

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Yakima, Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the DL, with the exception of the compounds listed in the following table. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
YTC-OFFP-151-DW-072722 YTC-OFFP-155-DW-072722 YTC-OFFP-148-DW-072722 YTC-OFFP-158-DW-072722 YTC-OFFP-157-DW-072722 YTC-OFFP-159-DW-072722 YTC-OFFP-318-DW-072722	Perfluorohexanoic acid (PFHxA) Perfluorooctanoic acid (PFOA) [MB 410-283846/1-A]	Detected sample results <LOQ and <BAL	"UB" at the LOQ
YTC-OFFP-313-DW-072722	Perfluorohexanoic acid (PFHxA) [MB 410-283846/1-A]	Detected sample results <LOQ and <BAL	"UB" at the LOQ
YTC-OFFP-150-DW-072722 YTC-OFFP-128-DW-072722	Perfluorohexanoic acid (PFHxA) [MB 410-283846/1-A] Perfluorooctanoic acid (PFOA) [MB 410-283846/1-A]	Detected sample results >LOQ and <BAL Detected sample results <LOQ and <BAL	J+ at the detected sample concentration "UB" at the LOQ

Note:

LOQ Limit of quantitation

MB Method blank

DATA REVIEW REPORT

3. System Performance

System performance was acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard. The initial calibration verification (ICV) standard recoveries must be within 70-130% of their true value.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in EPA method 537 version 2.0 Table 4.

The ion transitions were as specified in EPA method 537 version 2.0 Table 4.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

DATA REVIEW REPORT

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

An MS/MSD pair was not collected for a sample location associated with this SDG.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

A field duplicate was not collected for a sample location associated with this SDG.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

10. System Performance and Overall Assessment

Some of the compound results were qualified 'cn' that is defined as Refer to Case Narrative for further detail. The case narrative noted the detections in the method blank (see Section 2 above). The associated sample results were addressed above. Hence the "cn" qualifier can be ignored since the qualifiers impact to the data has been accessed and the qualifier has been removed in the database.

Two field reagent blanks (FRB), YTC-OFFP-FRB2-DW-072622 and YTC-OFFP-FRB3-DW-072722, were included with the samples in this SDG. No compounds were detected in the FRB YTC-OFFP-FRB2-DW-072622. Two PFAS compounds were detected in FRB YTC-OFFP-FRB3-DW-072722; however, the detects were determined to be the result of laboratory contamination found in the associated method blank. None of the data were qualified based on the FRB results.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

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DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X	X		
B. Equipment blanks	X				X
C. Field reagent blanks		X	X		
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate(MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field Duplicate (RPD)	X				X
Surrogate Standard %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Stage 3/4 Validation					
System performance check		X		X	
Initial calibration %RSD/%R		X		X	
Continuing calibration %R/%D		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculations acceptable		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

- %RSD Relative standard deviation
- %R Percent recovery
- RPD Relative percent difference
- %D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Sharon Pennington, Arcadis

SIGNATURE:



DATE: 09/07/2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: 09/07/2022

Tier 3
PFAS Calibration Standards %D

SDG #: J93119
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 9/7/2022
 Page: 1
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

PFOS 08/06/2022 Calibration Instrument 24743

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	46141	2461764	28.68	0.018743	1.161017	1.1873	0.452751	0.463	-2.214	-2.2	MATCH
0.926	90354	2469940	28.68	0.036581	1.132998	1.1873	0.883649	0.926	-4.574	-4.5	MATCH
2.31	270708	2541010	28.68	0.106536	1.322702	1.1873	2.573436	2.31	11.404	11.2	MATCH
4.63	508646	2455968	28.68	0.207106	1.282895	1.1873	5.002782	4.63	8.051	8.1	MATCH
18.5	1912216	2576759	28.68	0.742101	1.150457	1.1873	17.92594	18.5	-3.103	-3.2	MATCH
Avg RF					1.210014	No Match					

PFOS 08/09/2022 Calibration Instrument 24743

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	42395	2265344	28.68	0.018715	1.159254	1.2296	0.436512	0.463	-5.721	-5.7	MATCH
0.926	84531	2421541	28.68	0.034908	1.081166	1.2296	0.814216	0.926	-12.072	-12	MATCH
2.31	238357	2341122	28.68	0.101813	1.26407	1.2296	2.374757	2.31	2.803	2.6	MATCH
4.63	450354	2354240	28.68	0.191295	1.184954	1.2296	4.461887	4.63	-3.631	-3.6	MATCH
18.5	1725997	2146817	28.68	0.80398	1.246386	1.2296	18.75255	18.5	1.365	1.3	MATCH
Avg RF					1.187166	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

Concentration ng/ml = (Peak area ratio/slope) x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: J93119
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 9/7/2022
 Page: 2
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

ICV 410-284153/8 8/9/2022 12:43 Instrument 24743 Page 680

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	201950	2359543	28.68	0.085589	1.1925	2.0584	2.21	-6.86	-6.9	Match
PFHxS	221993	2359543	28.68	0.094083	1.2059	2.2376	2.36	-5.19	-5.3	Match
PFOS	204025	2359543	28.68	0.086468	1.2296	2.0168	2.39	-15.61	-15.6	Match
PFOA	832893	3249413	10	0.256321	1.045	2.4528	2.5	-1.89	-1.9	Match

CCVIS 410-284721/54, 08/11/2022, 01:34 Instrument 24743 Page 692

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	211294	2309570	28.68	0.091486	1.1925	2.2003	2.21	-0.44	-0.5	Match
PFHxS	229533	2309570	28.68	0.099383	1.2059	2.3636	2.28	3.67	3.7	Match
PFOS	224854	2309570	28.68	0.097358	1.2296	2.2708	2.31	-1.70	-1.9	Match
PFOA	844342	3030081	10	0.278653	1.045	2.6665	2.5	6.66	6.7	Match

Concentration ng/ml = (Peak area ratio/slope) x IS concentration

Tier 3
PFAS LCS

SDG #: J93119
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 9/7/2022
Page: 3
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

LCS ID LCS 410-282796/2-A

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ANALYTE PFOS

REPORTED LCS %R 90

REPORTED LCSD %R _____

REPORTED RPD _____

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration 17.1

LCSD Concentration _____

LCS TV 19

LCSD TV _____

LCS %R 90.00 MATCH

LCSD %R #DIV/0! MATCH

RPD 100

Tier 3
PFAS Sample Concentration

SDG #: J93119
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 9/7/2022
 Page: 4
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-200-DW-72622 Lab ID: 410-93119-10 Page 261
 Instrument: 24743 8/11/2022 3:53

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBS	24252	2599075	28.68	0.009331	1.1925	0.224	1	312.2	0.72	0.72 J	Match
PFHxS	123274	2599075	28.68	0.04743	1.2059	1.128	1	312.2	3.61	3.6	Match
PFOS	14908	2599075	28.68	0.005736	1.2296	0.134	1	312.2	0.43	0.43 J	Match

Sample ID: YTC-OFFP-218-DW-72622 Lab ID: 410-93119-13 Page 282
 Instrument: 24743 8/11/2022 4:27

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxA	320348	2895413	10	0.11064	0.9163	1.207	1	301.2	4.01	4	Match
PFHpA	52578	2895413	10	0.018159	0.7422	0.245	1	301.2	0.81	0.81 J	Match
PFOA	84709	2895413	10	0.029256	1.045	0.280	1	301.2	0.93	0.93 J	Match
PFBS	85432	2531663	28.68	0.033745	1.1925	0.812	1	301.2	2.69	2.7	Match
PFHxS	272061	2531663	28.68	0.107463	1.2059	2.556	1	301.2	8.49	8.5	Match
PFOS	79323	2531663	28.68	0.031332	1.2296	0.731	1	301.2	2.43	2.4	Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: J93119
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 9/7/2022
Page: 5
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-151-DW-072722 Lab ID: 410-93119-1 Page 152

Surrogate 13C2_PFHxA
REPORTED %R 94

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 9.4 Page 153
Surrogate TV 10.0
%R 94.0 MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

Client Information		Sampler	Lab PM		Camer Tracking No(s)		COC No		
Client Contact Andrew Kopchynski		Phone	Gordon, Stephen J		State of Origin		410-61650-17570 4		
Company Seres Engineering & Services LLC		PWSID:		Analysis Requested				Page <u>25</u> of <u>2</u>	
Address 669 Marina Drive Suite B7		Due Date Requested:		Total Number of Containers 537.1_DW - DW EPA 637.1 List of 18				Job #	
City Charleston		TAT Requested (days):						Preservation Codes:	
State, Zip SC, 29492		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No						A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Y - Trizma Z - other (specify)	
Phone: 720-344-3712(Tel)		PO # D18-218 PFAS PA/SI						Other:	
Email: afkopchynski@seres-es.com		WO # 3005993 YTC00							
Project Name Yakima Training Center (YTC)		Project # 41011531							
Site:		SSOW#:							
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, BT=Tissue, A=Air)			Special Instructions/Note:	
YTC-OFFP- FRB2-072022	07-26-22	1430	G	Drinking Water		X			
YTC-OFFP- 218-DW-072622	07-26-22	1422	G	Drinking Water		X			
YTC-OFFP- 139-DW-072622	07-26-22	0938	G	Drinking Water		X			
YTC-OFFP- 158-DW-072722	07-27-22	1319	G	Drinking Water		X			
YTC-OFFP- 151-DW-072722	07-27-22	1042	G	Drinking Water		X			
YTC-OFFP- 159-DW-072722	07-27-22	1303	G	Drinking Water		X			
YTC-OFFP- FRB3-072722	07-27-22	1338	G	Drinking Water		X			
YTC-OFFP- 313-DW-072722	07-27-22	1329	G	Drinking Water		X			
YTC-OFFP- 318-DW-072722	07-27-22	0957	G	Drinking Water		X			
YTC-OFFP-				Drinking Water					
YTC-OFFP-				Drinking Water					
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months				
Deliverable Requested: I, II, III, IV, Other (specify)					Special Instructions/QC Requirements:				
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment			
Relinquished by: <i>Service Reeper</i>		Date/Time: 07-28-22 4:00pm		Company: Arcadis		Received by:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Received by: <i>John H...</i>		Date/Time: 8-2-22 11:00	
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 2.8					

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Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 410-93119-1

Login Number: 93119

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 1

Creator: Bryan, Debra A

Question	Answer	Comment
The cooler's custody seal is intact.	True	
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 ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	IDs on containers do not match the COC. Logged in per COC.
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	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Refer to Job Narrative for details.
Sample custody seals are intact.	N/A	Not present.
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	



Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Qualifiers

LCMS

Qualifier	Qualifier Description
B	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
cn	Refer to Case Narrative for further detail
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
M	Manual integrated compound.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
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

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-151-DW-072722

Lab Sample ID: 410-93119-1

Date Collected: 07/27/22 09:07

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.3	J B cn	1.7 UB	1.7	1.2	0.42	ng/L	08/12/22 03:39	1
Perfluoroheptanoic acid	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
Perfluorooctanoic acid	0.88	J cn	1.7 UB	1.7	1.2	0.42	ng/L	08/12/22 03:39	1
Perfluorononanoic acid	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
Perfluorodecanoic acid	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
Perfluorotridecanoic acid	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
Perfluorotetradecanoic acid	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
Perfluorobutanesulfonic acid	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
Perfluorohexanesulfonic acid	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
Perfluorooctanesulfonic acid	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
NEtFOSAA	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
NMeFOSAA	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
Perfluoroundecanoic acid	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
Perfluorododecanoic acid	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
HFPODA	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
9CI-PF3ONS	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
11CI-PF3OUdS	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	
DONA	<1.2		1.7	1.2	0.42	ng/L	08/12/22 03:39	1	

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99		70 - 130	08/08/22 12:35	08/12/22 03:39	1
13C2 PFHxA	94		70 - 130	08/08/22 12:35	08/12/22 03:39	1
13C3 HFPO-DA	87		70 - 130	08/08/22 12:35	08/12/22 03:39	1
d5-NEtFOSAA	86		70 - 130	08/08/22 12:35	08/12/22 03:39	1

~~**Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE**~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
NEtFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
NMeFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
HFPODA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
9CI-PF3ONS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
11CI-PF3OUdS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1
DONA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:26	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	97		70 - 130	08/18/22 09:57	08/24/22 09:26	1
13C2 PFHxA	97		70 - 130	08/18/22 09:57	08/24/22 09:26	1
13C3 HFPO-DA	92		70 - 130	08/18/22 09:57	08/24/22 09:26	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-151-DW-072722

Lab Sample ID: 410-93119-1

Date Collected: 07/27/22 09:07

Matrix: Drinking Water

Date Received: 08/02/22 11:10

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)~~

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	93		70 - 130	08/18/22 09:57	08/24/22 09:26	1

Client Sample ID: YTC-OFFP-155-DW-072722

Lab Sample ID: 410-93119-2

Date Collected: 07/27/22 09:45

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.5	J B en	1.6 UB	1.6	1.2	0.40		08/12/22 03:51	1
Perfluoroheptanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
Perfluorooctanoic acid	0.92	J en	1.6 UB	1.6	1.2	0.40		08/12/22 03:51	1
Perfluorononanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
Perfluorodecanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
Perfluorotridecanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
Perfluorotetradecanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
Perfluorobutanesulfonic acid	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
Perfluorohexanesulfonic acid	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
Perfluorooctanesulfonic acid	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
NEtFOSAA	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
NMeFOSAA	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
Perfluoroundecanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
Perfluorododecanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
HFPODA	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
9CI-PF3ONS	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
11CI-PF3OUdS	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1
DONA	<1.2		1.6	1.2	0.40	ng/L		08/12/22 03:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130	08/08/22 12:35	08/12/22 03:51	1
13C2 PFHxA	96		70 - 130	08/08/22 12:35	08/12/22 03:51	1
13C3 HFPO-DA	87		70 - 130	08/08/22 12:35	08/12/22 03:51	1
d5-NEtFOSAA	95		70 - 130	08/08/22 12:35	08/12/22 03:51	1

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
Perfluoroheptanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
Perfluorooctanoic acid	<1.2	H M	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
Perfluorononanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
Perfluorodecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
Perfluorotridecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
Perfluorotetradecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
Perfluorobutanesulfonic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
Perfluorohexanesulfonic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
Perfluorooctanesulfonic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
NEtFOSAA	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
NMeFOSAA	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
Perfluoroundecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
Perfluorododecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
HFPODA	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-155-DW-072722

Lab Sample ID: 410-93119-2

Date Collected: 07/27/22 09:45

Matrix: Drinking Water

Date Received: 08/02/22 11:10

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
9CI-PF3ONS	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
11CI-PF3OUdS	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1
DONA	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 09:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	106		70 - 130	08/18/22 09:57	08/24/22 09:38	1
13C2 PFHxA	98		70 - 130	08/18/22 09:57	08/24/22 09:38	1
13C3 HFPO-DA	103		70 - 130	08/18/22 09:57	08/24/22 09:38	1
d5-NEtFOSAA	99		70 - 130	08/18/22 09:57	08/24/22 09:38	1

Client Sample ID: YTC-OFFP-150-DW-072722

Lab Sample ID: 410-93119-3

Date Collected: 07/27/22 09:20

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.9	B cn J+	1.7	1.3	0.43	ng/L		08/12/22 04:02	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
Perfluorooctanoic acid	1.2	J cn, 1.7 UB	1.7	1.3	0.43	ng/L		08/12/22 04:02	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 04:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102		70 - 130	08/08/22 12:35	08/12/22 04:02	1
13C2 PFHxA	98		70 - 130	08/08/22 12:35	08/12/22 04:02	1
13C3 HFPO-DA	90		70 - 130	08/08/22 12:35	08/12/22 04:02	1
d5-NEtFOSAA	86		70 - 130	08/08/22 12:35	08/12/22 04:02	1

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
Perfluorooctanoic acid	<1.3	H M	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
Perfluorobutanesulfonic acid	0.44	J H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-150-DW-072722

Lab Sample ID: 410-93119-3

Date Collected: 07/27/22 09:20

Matrix: Drinking Water

Date Received: 08/02/22 11:10

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
NEtFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
NMeFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
HFPODA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
9CI-PF3ONS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
11CI-PF3OUdS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
DONA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 09:49	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	104		70 - 130				08/18/22 09:57	08/24/22 09:49	1
13C2 PFHxA	101		70 - 130				08/18/22 09:57	08/24/22 09:49	1
13C3 HFPO-DA	98		70 - 130				08/18/22 09:57	08/24/22 09:49	1
d5-NEtFOSAA	96		70 - 130				08/18/22 09:57	08/24/22 09:49	1

Client Sample ID: YTC-OFFP-148-DW-072722

Lab Sample ID: 410-93119-4

Date Collected: 07/27/22 11:18

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.4	J B cn	1.7 UB	1.7	1.3	0.42	ng/L	08/12/22 04:14	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
Perfluorooctanoic acid	0.75	J cn	1.7 UB	1.7	1.3	0.42	ng/L	08/12/22 04:14	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 04:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	99		70 - 130				08/08/22 12:35	08/12/22 04:14	1
13C2 PFHxA	94		70 - 130				08/08/22 12:35	08/12/22 04:14	1
13C3 HFPO-DA	87		70 - 130				08/08/22 12:35	08/12/22 04:14	1
d5-NEtFOSAA	90		70 - 130				08/08/22 12:35	08/12/22 04:14	1

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-148-DW-072722

Lab Sample ID: 410-93119-4

Date Collected: 07/27/22 11:18

Matrix: Drinking Water

Date Received: 08/02/22 11:10

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
Perfluorooctanoic acid	<1.3	H M	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
NEtFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
NMeFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
HFPODA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
9Cl-PF3ONS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
11Cl-PF3OUdS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1
DONA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 10:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	104		70 - 130	08/18/22 09:57	08/24/22 10:12	1
13C2 PFHxA	99		70 - 130	08/18/22 09:57	08/24/22 10:12	1
13C3 HFPO-DA	96		70 - 130	08/18/22 09:57	08/24/22 10:12	1
85-NEtFOSAA	95		70 - 130	08/18/22 09:57	08/24/22 10:12	1

Client Sample ID: YTC-OFFP-45-DW-072622

Lab Sample ID: 410-93119-5

Date Collected: 07/26/22 13:50

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 03:30	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-45-DW-072622

Lab Sample ID: 410-93119-5

Date Collected: 07/26/22 13:50

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	107		70 - 130	08/04/22 10:11	08/11/22 03:30	1
13C2 PFHxA	105		70 - 130	08/04/22 10:11	08/11/22 03:30	1
13C3 HFPO-DA	109		70 - 130	08/04/22 10:11	08/11/22 03:30	1
d5-NEtFOSAA	90		70 - 130	08/04/22 10:11	08/11/22 03:30	1

Client Sample ID: YTC-OFFP-167-DW-072622

Lab Sample ID: 410-93119-6

Date Collected: 07/26/22 12:52

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/09/22 02:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102		70 - 130	08/04/22 10:11	08/09/22 02:03	1
13C2 PFHxA	103		70 - 130	08/04/22 10:11	08/09/22 02:03	1
13C3 HFPO-DA	103		70 - 130	08/04/22 10:11	08/09/22 02:03	1
d5-NEtFOSAA	88		70 - 130	08/04/22 10:11	08/09/22 02:03	1

Client Sample ID: YTC-OFFP-140-DW-072622

Lab Sample ID: 410-93119-7

Date Collected: 07/26/22 09:18

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
Perfluorohexanesulfonic acid	0.53	J	1.8	1.3	0.45	ng/L		08/09/22 02:15	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-140-DW-072622

Lab Sample ID: 410-93119-7

Date Collected: 07/26/22 09:18

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
NEtFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
NMeFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
HFPODA	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
9CI-PF3ONS	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
DONA	<1.3		1.8	1.3	0.45	ng/L		08/09/22 02:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130				08/04/22 10:11	08/09/22 02:15	1
13C2 PFHxA	98		70 - 130				08/04/22 10:11	08/09/22 02:15	1
13C3 HFPO-DA	99		70 - 130				08/04/22 10:11	08/09/22 02:15	1
d5-NEtFOSAA	88		70 - 130				08/04/22 10:11	08/09/22 02:15	1

Client Sample ID: YTC-OFFP-128-DW-072722

Lab Sample ID: 410-93119-8

Date Collected: 07/27/22 10:27

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.7	B cn J+	1.7	1.3	0.44	ng/L		08/12/22 04:26	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
Perfluorooctanoic acid	0.91	J cn 1.7 UB	1.7	1.3	0.44	ng/L		08/12/22 04:26	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
NEtFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
NMeFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
HFPODA	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
9CI-PF3ONS	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
DONA	<1.3		1.7	1.3	0.44	ng/L		08/12/22 04:26	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130				08/08/22 12:35	08/12/22 04:26	1
13C2 PFHxA	95		70 - 130				08/08/22 12:35	08/12/22 04:26	1
13C3 HFPO-DA	89		70 - 130				08/08/22 12:35	08/12/22 04:26	1
d5-NEtFOSAA	81		70 - 130				08/08/22 12:35	08/12/22 04:26	1

~~**Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE**~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-128-DW-072722

Lab Sample ID: 410-93119-8

Date Collected: 07/27/22 10:27

Matrix: Drinking Water

Date Received: 08/02/22 11:10

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
NEtFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
NMeFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
HFPODA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
9Cl-PF3ONS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
11Cl-PF3OUdS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1
DONA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 11:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99		70 - 130	08/18/22 11:19	08/24/22 11:23	1
13C2 PFHxA	100		70 - 130	08/18/22 11:19	08/24/22 11:23	1
13C3 HFPO-DA	101		70 - 130	08/18/22 11:19	08/24/22 11:23	1
ds-NEtFOSAA	92		70 - 130	08/18/22 11:19	08/24/22 11:23	1

Client Sample ID: YTC-OFFP-141-DW-072622

Lab Sample ID: 410-93119-9

Date Collected: 07/26/22 10:00

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
NEtFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
NMeFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
HFPODA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1
DONA	<1.3		1.7	1.3	0.44	ng/L		08/11/22 03:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	104		70 - 130	08/04/22 10:11	08/11/22 03:41	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-141-DW-072622

Lab Sample ID: 410-93119-9

Date Collected: 07/26/22 10:00

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	100		70 - 130	08/04/22 10:11	08/11/22 03:41	1
13C3 HFPO-DA	106		70 - 130	08/04/22 10:11	08/11/22 03:41	1
d5-NEtFOSAA	84		70 - 130	08/04/22 10:11	08/11/22 03:41	1

Client Sample ID: YTC-OFFP-200-DW-072622

Lab Sample ID: 410-93119-10

Date Collected: 07/26/22 13:32

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
Perfluoroheptanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
Perfluorooctanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
Perfluorononanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
Perfluorodecanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
Perfluorotridecanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
Perfluorotetradecanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
Perfluorobutanesulfonic acid	0.72	J	1.6	1.2	0.40	ng/L		08/11/22 03:53	1
Perfluorohexanesulfonic acid	3.6		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
Perfluorooctanesulfonic acid	0.43	J	1.6	1.2	0.40	ng/L		08/11/22 03:53	1
NEtFOSAA	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
NMeFOSAA	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
Perfluoroundecanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
Perfluorododecanoic acid	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
HFPODA	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
9CI-PF3ONS	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
11CI-PF3OUdS	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1
DONA	<1.2		1.6	1.2	0.40	ng/L		08/11/22 03:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	108		70 - 130	08/04/22 10:11	08/11/22 03:53	1
13C2 PFHxA	110		70 - 130	08/04/22 10:11	08/11/22 03:53	1
13C3 HFPO-DA	101		70 - 130	08/04/22 10:11	08/11/22 03:53	1
d5-NEtFOSAA	92		70 - 130	08/04/22 10:11	08/11/22 03:53	1

Client Sample ID: YTC-OFFP-144-DW-072622

Lab Sample ID: 410-93119-11

Date Collected: 07/26/22 10:47

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-144-DW-072622

Lab Sample ID: 410-93119-11

Date Collected: 07/26/22 10:47

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:04	1
Surrogate	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac		
13C2 PFDA	105		70 - 130		08/04/22 10:11	08/11/22 04:04	1		
13C2 PFHxA	101		70 - 130		08/04/22 10:11	08/11/22 04:04	1		
13C3 HFPO-DA	104		70 - 130		08/04/22 10:11	08/11/22 04:04	1		
d5-NEtFOSAA	82		70 - 130		08/04/22 10:11	08/11/22 04:04	1		

Client Sample ID: YTC-OFFP-FRB2-DW-072622

Lab Sample ID: 410-93119-12

Date Collected: 07/26/22 14:30

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/09/22 03:01	1
Surrogate	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac		
13C2 PFDA	100		70 - 130		08/04/22 10:11	08/09/22 03:01	1		
13C2 PFHxA	91		70 - 130		08/04/22 10:11	08/09/22 03:01	1		
13C3 HFPO-DA	93		70 - 130		08/04/22 10:11	08/09/22 03:01	1		
d5-NEtFOSAA	91		70 - 130		08/04/22 10:11	08/09/22 03:01	1		

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-218-DW-072622

Lab Sample ID: 410-93119-13

Date Collected: 07/26/22 14:22

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	4.0		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
Perfluoroheptanoic acid	0.81	J	1.7	1.2	0.42	ng/L		08/11/22 04:27	1
Perfluorooctanoic acid	0.93	J	1.7	1.2	0.42	ng/L		08/11/22 04:27	1
Perfluorononanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
Perfluorodecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
Perfluorotridecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
Perfluorotetradecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
Perfluorobutanesulfonic acid	2.7		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
Perfluorohexanesulfonic acid	8.5		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
Perfluorooctanesulfonic acid	2.4		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
NEtFOSAA	<1.2		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
NMeFOSAA	<1.2		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
Perfluoroundecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
Perfluorododecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
HFPODA	<1.2		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
9CI-PF3ONS	<1.2		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
11CI-PF3OUdS	<1.2		1.7	1.2	0.42	ng/L		08/11/22 04:27	1
DONA	<1.2		1.7	1.2	0.42	ng/L		08/11/22 04:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	110		70 - 130	08/04/22 10:11	08/11/22 04:27	1
13C2 PFHxA	107		70 - 130	08/04/22 10:11	08/11/22 04:27	1
13C3 HFPO-DA	109		70 - 130	08/04/22 10:11	08/11/22 04:27	1
d5-NEtFOSAA	91		70 - 130	08/04/22 10:11	08/11/22 04:27	1

Client Sample ID: YTC-OFFP-139-DW-072622

Lab Sample ID: 410-93119-14

Date Collected: 07/26/22 09:38

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/11/22 04:39	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-139-DW-072622

Lab Sample ID: 410-93119-14

Date Collected: 07/26/22 09:38

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	106		70 - 130	08/04/22 10:11	08/11/22 04:39	1
13C2 PFHxA	98		70 - 130	08/04/22 10:11	08/11/22 04:39	1
13C3 HFPO-DA	100		70 - 130	08/04/22 10:11	08/11/22 04:39	1
d5-NEtFOSAA	88		70 - 130	08/04/22 10:11	08/11/22 04:39	1

Client Sample ID: YTC-OFFP-158-DW-072722

Lab Sample ID: 410-93119-15

Date Collected: 07/27/22 13:19

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.3	J B cn	1.8 UB	1.8	1.3	0.44 ng/L		08/12/22 04:37	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
Perfluorooctanoic acid	0.67	J cn	1.8 UB	1.8	1.3	0.44 ng/L		08/12/22 04:37	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
NEtFOSAA	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
NMeFOSAA	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
HFPODA	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1
DONA	<1.3		1.8	1.3	0.44 ng/L			08/12/22 04:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	95		70 - 130	08/08/22 12:35	08/12/22 04:37	1
13C2 PFHxA	97		70 - 130	08/08/22 12:35	08/12/22 04:37	1
13C3 HFPO-DA	87		70 - 130	08/08/22 12:35	08/12/22 04:37	1
d5-NEtFOSAA	85		70 - 130	08/08/22 12:35	08/12/22 04:37	1

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.43 ng/L			08/24/22 11:35	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.43 ng/L			08/24/22 11:35	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.43 ng/L			08/24/22 11:35	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.43 ng/L			08/24/22 11:35	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.43 ng/L			08/24/22 11:35	1
Perfluorotridecanoic acid	0.43	J H	1.7	1.3	0.43 ng/L			08/24/22 11:35	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.43 ng/L			08/24/22 11:35	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.43 ng/L			08/24/22 11:35	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.43 ng/L			08/24/22 11:35	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.43 ng/L			08/24/22 11:35	1
NEtFOSAA	<1.3	H	1.7	1.3	0.43 ng/L			08/24/22 11:35	1
NMeFOSAA	<1.3	H	1.7	1.3	0.43 ng/L			08/24/22 11:35	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.43 ng/L			08/24/22 11:35	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-158-DW-072722

Lab Sample ID: 410-93119-15

Date Collected: 07/27/22 13:19

Matrix: Drinking Water

Date Received: 08/02/22 11:10

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 11:35	1
HFPODA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 11:35	1
9CI-PF3ONS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 11:35	1
11CI-PF3OUdS	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 11:35	1
DONA	<1.3	H	1.7	1.3	0.43	ng/L		08/24/22 11:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	96		70 - 130	08/18/22 11:19	08/24/22 11:35	1
13C2 PFHxA	95		70 - 130	08/18/22 11:19	08/24/22 11:35	1
13C3 HFPO-DA	92		70 - 130	08/18/22 11:19	08/24/22 11:35	1
d5-NEtFOSAA	90		70 - 130	08/18/22 11:19	08/24/22 11:35	1

Client Sample ID: YTC-OFFP-157-DW-072722

Lab Sample ID: 410-93119-16

Date Collected: 07/27/22 10:42

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.6 J B cn		1.7 UB	1.3	0.43	ng/L		08/12/22 05:00	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
Perfluorooctanoic acid	0.88 J cn		1.7 UB	1.3	0.43	ng/L		08/12/22 05:00	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99		70 - 130	08/08/22 12:35	08/12/22 05:00	1
13C2 PFHxA	96		70 - 130	08/08/22 12:35	08/12/22 05:00	1
13C3 HFPO-DA	90		70 - 130	08/08/22 12:35	08/12/22 05:00	1
d5-NEtFOSAA	94		70 - 130	08/08/22 12:35	08/12/22 05:00	1

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
Perfluoroheptanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
Perfluorooctanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
Perfluorononanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
Perfluorodecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
Perfluorotridecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-157-DW-072722

Lab Sample ID: 410-93119-16

Date Collected: 07/27/22 10:42

Matrix: Drinking Water

Date Received: 08/02/22 11:10

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE (Continued)~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorotetradecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
Perfluorobutanesulfonic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
Perfluorohexanesulfonic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
Perfluorooctanesulfonic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
NEtFOSAA	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
NMeFOSAA	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
Perfluoroundecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
Perfluorododecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
HFPODA	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
9Cl-PF3ONS	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
11Cl-PF3OUdS	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
DONA	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	98		70 - 130				08/18/22 11:19	08/24/22 11:46	1
13C2 PFHxA	100		70 - 130				08/18/22 11:19	08/24/22 11:46	1
13C3 HFPO-DA	97		70 - 130				08/18/22 11:19	08/24/22 11:46	1
d5-NEtFOSAA	98		70 - 130				08/18/22 11:19	08/24/22 11:46	1

Client Sample ID: YTC-OFFP-159-DW-072722

Lab Sample ID: 410-93119-17

Date Collected: 07/27/22 13:03

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.3 J B cn	1.7 UB	1.7	1.2	0.42	ng/L		08/12/22 05:12	1
Perfluoroheptanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
Perfluorooctanoic acid	0.65 J cn	1.7 UB	1.7	1.2	0.42	ng/L		08/12/22 05:12	1
Perfluorononanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
Perfluorodecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
Perfluorotridecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
Perfluorotetradecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
Perfluorobutanesulfonic acid	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
Perfluorohexanesulfonic acid	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
Perfluorooctanesulfonic acid	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
NEtFOSAA	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
NMeFOSAA	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
Perfluoroundecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
Perfluorododecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
HFPODA	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
9Cl-PF3ONS	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
11Cl-PF3OUdS	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
DONA	<1.2		1.7	1.2	0.42	ng/L		08/12/22 05:12	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130				08/08/22 12:35	08/12/22 05:12	1
13C2 PFHxA	91		70 - 130				08/08/22 12:35	08/12/22 05:12	1
13C3 HFPO-DA	85		70 - 130				08/08/22 12:35	08/12/22 05:12	1
d5-NEtFOSAA	88		70 - 130				08/08/22 12:35	08/12/22 05:12	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-159-DW-072722

Lab Sample ID: 410-93119-17

Date Collected: 07/27/22 13:03

Matrix: Drinking Water

Date Received: 08/02/22 11:10

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
Perfluoroheptanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
Perfluorooctanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
Perfluorononanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
Perfluorodecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
Perfluorotridecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
Perfluorotetradecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
Perfluorobutanesulfonic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
Perfluorohexanesulfonic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
Perfluorooctanesulfonic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
NEtFOSAA	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
NMeFOSAA	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
Perfluoroundecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
Perfluorododecanoic acid	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
HFPODA	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
9CI-PF3ONS	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
11CI-PF3OUdS	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1
DONA	<1.2	H	1.7	1.2	0.42	ng/L		08/24/22 11:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99		70 - 130	08/18/22 11:19	08/24/22 11:58	1
13C2 PFHxA	102		70 - 130	08/18/22 11:19	08/24/22 11:58	1
13C3 HFPO-DA	96		70 - 130	08/18/22 11:19	08/24/22 11:58	1
ds-NEtFOSAA	95		70 - 130	08/18/22 11:19	08/24/22 11:58	1

Client Sample ID: YTC-OFFP-FRB3-DW-072722

Lab Sample ID: 410-93119-18

Date Collected: 07/27/22 13:38

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.2	J B cn	1.7	1.3	0.42	ng/L		08/12/22 05:23	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
Perfluorooctanoic acid	0.55	J cn	1.7	1.3	0.42	ng/L		08/12/22 05:23	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/12/22 05:23	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-FRB3-DW-072722

Lab Sample ID: 410-93119-18

Date Collected: 07/27/22 13:38

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	92		70 - 130	08/08/22 12:35	08/12/22 05:23	1
13C2 PFHxA	89		70 - 130	08/08/22 12:35	08/12/22 05:23	1
13C3 HFPO-DA	84		70 - 130	08/08/22 12:35	08/12/22 05:23	1
d5-NEtFOSAA	87		70 - 130	08/08/22 12:35	08/12/22 05:23	1

~~Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
NEtFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
NMeFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
HFPODA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
9CI-PF3ONS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
11CI-PF3OUdS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1
DONA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	105		70 - 130	08/18/22 11:19	08/24/22 12:09	1
13C2 PFHxA	98		70 - 130	08/18/22 11:19	08/24/22 12:09	1
13C3 HFPO-DA	96		70 - 130	08/18/22 11:19	08/24/22 12:09	1
d5-NEtFOSAA	102		70 - 130	08/18/22 11:19	08/24/22 12:09	1

Client Sample ID: YTC-OFFP-313-DW-072722

Lab Sample ID: 410-93119-19

Date Collected: 07/27/22 13:29

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	0.64 1.8 UB	cn	1.8	1.3	0.44	ng/L		08/12/22 05:35	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
Perfluorooctanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/12/22 05:35	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-313-DW-072722

Lab Sample ID: 410-93119-19

Date Collected: 07/27/22 13:29

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/12/22 05:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	93		70 - 130	08/08/22 12:35	08/12/22 05:35	1
13C2 PFHxA	92		70 - 130	08/08/22 12:35	08/12/22 05:35	1
13C3 HFPO-DA	86		70 - 130	08/08/22 12:35	08/12/22 05:35	1
d5-NEtFOSAA	77		70 - 130	08/08/22 12:35	08/12/22 05:35	1

~~**Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE**~~

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
Perfluorohexanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
NEtFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
NMeFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
HFPODA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
9CI-PF3ONS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
11CI-PF3OUdS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1
DONA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102		70 - 130	08/18/22 11:19	08/24/22 12:21	1
13C2 PFHxA	100		70 - 130	08/18/22 11:19	08/24/22 12:21	1
13C3 HFPO-DA	98		70 - 130	08/18/22 11:19	08/24/22 12:21	1
d5-NEtFOSAA	94		70 - 130	08/18/22 11:19	08/24/22 12:21	1

Client Sample ID: YTC-OFFP-318-DW-072722

Lab Sample ID: 410-93119-20

Date Collected: 07/27/22 09:57

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.4 J B cn	1.7 UB	1.7	1.3	0.43	ng/L		08/12/22 05:46	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1
Perfluorooctanoic acid	0.66 J cn	1.7 UB	1.7	1.3	0.43	ng/L		08/12/22 05:46	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93119-1

Client Sample ID: YTC-OFFP-318-DW-072722

Lab Sample ID: 410-93119-20

Date Collected: 07/27/22 09:57

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1
Perfluorohexanesulfonic acid	0.53	J	1.7	1.3	0.43	ng/L		08/12/22 05:46	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/12/22 05:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	93		70 - 130	08/08/22 12:35	08/12/22 05:46	1
13C2 PFHxA	92		70 - 130	08/08/22 12:35	08/12/22 05:46	1
13C3 HFPO-DA	86		70 - 130	08/08/22 12:35	08/12/22 05:46	1
d5-NEtFOSAA	88		70 - 130	08/08/22 12:35	08/12/22 05:46	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
Perfluoroheptanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
Perfluorooctanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
Perfluorononanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
Perfluorodecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
Perfluorotridecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
Perfluorotetradecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
Perfluorobutanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
Perfluorohexanesulfonic acid	0.58	J H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
Perfluorooctanesulfonic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
NEtFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
NMeFOSAA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
Perfluoroundecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
Perfluorododecanoic acid	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
HFPODA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
9Cl-PF3ONS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
11Cl-PF3OUdS	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1
DONA	<1.3	H	1.7	1.3	0.42	ng/L		08/24/22 12:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99		70 - 130	08/18/22 11:19	08/24/22 12:33	1
13C2 PFHxA	98		70 - 130	08/18/22 11:19	08/24/22 12:33	1
13C3 HFPO-DA	93		70 - 130	08/18/22 11:19	08/24/22 12:33	1
d5-NEtFOSAA	96		70 - 130	08/18/22 11:19	08/24/22 12:33	1

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG # 410-93134-1

Analyses Performed By:

Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report # 46589R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93134-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-204-DW-072822	410-93134-1	Water	7/28/2022		X
YTC-OFFP-183-DW-072822	410-93134-2	Water	7/28/2022		X
YTC-OFFP-170-DW-072822	410-93134-3	Water	7/28/2022		X
YTC-OFFP-208-DW-072822	410-93134-4	Water	7/28/2022		X
YTC-OFFP-180-DW-072822	410-93134-5	Water	7/28/2022		X
YTC-OFFP-FRB-04-072822	410-93134-6	Water	7/28/2022		X
YTC-OFFP-171-DW-072822	410-93134-7	Water	7/28/2022		X
YTC-OFFP-168-DW-072822	410-93134-8	Water	7/28/2022		X
YTC-OFFP-289-DW-072822	410-93134-9	Water	7/28/2022		X
YTC-OFFP-284-DW-072822	410-93134-10	Water	7/28/2022		X
YTC-OFFP-169-DW-072822	410-93134-11	Water	7/28/2022		X
YTC-OFFP-275-DW-072822	410-93134-12	Water	7/28/2022		X
YTC-OFFP-254-DW-072822	410-93134-13	Water	7/28/2022		X
YTC-OFFP-FD-04-072822	410-93134-14	Water	7/28/2022	YTC-OFFP-183-DW-072822	X

Notes:

1. Stage 3/4 validation was performed on sample locations YTC-OFFP-284-DW-072822 and YTC-OFFP-275-DW-072822.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location YTC-OFFP-183-DW-072822.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Yakima, Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria except as noted below.

The analyses that exceeded the holding time are presented in the following table.

Sample Location	Compounds	Holding Time	Criteria
YTC-OFFP-289-DW-072822	Perfluorohexanesulfonic acid Perfluorooctanesulfonic acid	Extraction Completed 26 days from collection	< 14 days

Sample results associated with sample locations analyzed by analytical method USEPA method 537 version 2.0 were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed past holding time	J	UJ

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance was acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of

DATA REVIEW REPORT

acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard. The initial calibration verification (ICV) standard recoveries must be within 70-130% of their true value.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in EPA method 537 version 2.0 Table 4.

The ion transitions were as specified in EPA method 537 version 2.0 Table 4.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

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Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis performed on sample location YTC-OFFP-183-DW-072822 exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
YTC-OFFP-183-DW-072822 / YTC-OFFP-FD-04-072822	All target compounds	U	U	AC

Note:

AC Acceptable

The results between the parent sample and field duplicate were acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compounds	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-289-DW-072822	Perfluorohexanesulfonic acid	--	290	290 D
	Perfluorooctanesulfonic acid	--	200	200 D
YTC-OFFP-275-DW-072822	Perfluorohexanoic acid	--	59	59 D
	Perfluorohexanesulfonic acid	--	170	170 D
	Perfluorooctanesulfonic acid	--	150	150 D

Note: The laboratory did not report the original analysis, only the diluted result.

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Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range.	D

Note a number of results were manually integrated which were spot checked. The manual quantitation (M) laboratory qualifier has been preserved with the data as informational data for the end user; there was no impact on the data usability.

10. System Performance and Overall Assessment

Some of the compound results were qualified 'cn' that is defined as Refer to Case Narrative for further detail. The case narrative was reviewed, and associated data qualified if appropriate. The case narrative comment related to only sample location YTC-OFFP-289-DW-072822 (410-93134-9) even though all data were qualified. Hence the "cn" qualifier can be ignored since the qualifiers impact to the data has been accessed and the qualifier has been removed in the database.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field reagent blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate Standard %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Stage 3/4 Validation					
System performance check		X		X	
Initial calibration %RSD/%R		X		X	
Continuing calibration %R/%D		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculations acceptable		X		X	

DATA REVIEW REPORT


PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

- %RSD Relative standard deviation
- %R Percent recovery
- RPD Relative percent difference
- %D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Suresh PR, Arcadis

SIGNATURE: 

DATE: August 29, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: August 29, 2022

Tier 3
PFAS Calibration Standards %D

SDG #: 410-93134-1
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/29/2022
 Page: 1
 Validated by: SPR

Method: EPA Method 537.1, Version 2.0

PFOS, 08/15/2022 Calibration

Instrument 24743

Page: 246

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	40522	2343719	28.68	0.01729	1.070985	1.243	0.3989	0.463	-13.839	-13.8	MATCH
0.926	84332	2272090	28.68	0.037116	1.149569	1.243	0.8564	0.926	-7.517	-7.5	MATCH
2.31	252534	2386019	28.68	0.105839	1.314054	1.243	2.4420	2.31	5.716	5.5	MATCH
4.63	474684	2313129	28.68	0.205213	1.271168	1.243	4.7349	4.63	2.266	2.3	MATCH
18.5	1824120	2286170	28.68	0.797893	1.23695	1.243	18.4100	18.5	-0.486	-0.6	MATCH
Avg RF					1.208545	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

Concentration ng/ml = (Peak area ratio/slope) x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: 410-93134-1
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/29/2022
 Page: 2
 Validated by: SPR

Method: EPA Method 537.1, Version 2.0

ICV 410-286092/8 8/15/2022 17:57 Instrument 24743 Page: 452

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	199884	2299974	28.68	0.086907	1.149	2.169273	2.21	-1.84	-1.9	Match
PFOS	200903	2299974	28.68	0.08735	1.243	2.015448	2.39	-15.67	-15.7	Match
PFOA	812363	2956886	10	0.274736	1.05	2.616533	2.5	4.66	4.7	Match

CCVLIS 410-286468/1 8/16/2022 12:03 Instrument 24743 Page 458

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	34751	2159846	28.68	0.01609	1.149	0.40161	0.443	-9.34	-9.2	Match
PFOS	39977	2159846	28.68	0.018509	1.243	0.42707	0.463	-7.76	-7.7	Match
PFOA	138523	2798346	10	0.049502	1.05	0.47145	0.5	-5.71	-5.7	Match

CCVLIS 410-286468/49 8/16/2022 21:16 Instrument 24743 Page 471

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	219295	2429200	28.68	0.090275	1.149	2.25333	2.21	1.96	1.8	Match
PFOS	249403	2429200	28.68	0.102669	1.243	2.36890	2.31	2.55	2.4	Match
PFOA	872682	3125195	10	0.279241	1.05	2.65944	2.5	6.38	6.4	Match

Concentration ng/ml = (Peak area ratio/slope) x IS concentration

Tier 3
PFAS LCS

SDG #: 410-93134-1
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/29/2022
Page: 3
Validated by: SPR

Method: EPA Method 537.1, Version 2.0

LCS ID 410-284589/2-A
ANALYTE PFOS
REPORTED LCS %R 82

Page: 106

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

LCS Concentration 15.6
LCS TV 19
LCSD TV 20.5

LCS %R 82.11 MATCH

Tier 3
PFAS MS/MSD

SDG #: 410-93134-1
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/29/2022
Page: 4
Validated by: SPR

Method: EPA Method 537.1, Version 2.0

MS/MSD Sample ID YTC-OFFP-183-DW-072822

Page: 108 & 109

ANALYTE PFOS
REPORTED MS %R 86
REPORTED MSD %R 80
REPORTED RPD 7

$$\%R = \frac{100 * \text{MS Concentration}}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * | \text{MS \%R} - \text{MSD \%R} |}{\text{Average of MS MSD \%R}}$$

Sample Concentration 0
MS Concentration 14.2
MSD Concentration 13.3
MS TV 16.5
MSD TV 16.6

MS %R 86.06 MATCH
MSD %R 80.12 MATCH
RPD 6.55 MATCH

Lab recoveries are calculated with more significant figures.
%R may not match using rounded values from MS/MSD forms

Tier 3
PFAS Sample Concentration

SDG #: 410-93134-1
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/29/2022
 Page: 5
 Validated by: SPR

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-284-DW-072822 Lab ID: 410-93134-10 Page 193
 Instrument: 24743 8/16/2022 22:02

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFBS	1091309	2591676	28.68	0.421082	1.149	10.51	1	303.4	34.64	35
PFOS 10X	737067	2705884	28.68	0.272394	1.1661	6.70	1	303.4	220.81	220
PFOA	2562166	3098676	10	0.826858	1.05	7.87	1	303.4	25.96	26

Match
Match
Match

Sample ID: YTC-OFFP-275-DW-072822 Lab ID: 410-93134-12 Page 216
 Instrument: 24743 8/16/2022 22:25

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFBS	868006	2624628	28.68	0.330716	1.149	8.25	1	285	28.96	29
PFOS 10X	472615	2722951	28.68	0.173567	1.1661	4.27	1	285	149.78	150
PFOA	3064880	3027108	10	1.012478	1.05	9.64	1	285	33.83	34

Match
Match
Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: 410-93134-1
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/29/2022
Page: 6
Validated by: SPR

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-284-DW-072822 Lab ID: 410-93134-10 Page 193

Surrogate 13C2 PFHxA
REPORTED %R 102

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 10.2
Surrogate TV 10.0
%R 102.0 MATCH

Sample ID: YTC-OFFP-275-DW-072822 Lab ID: 410-93134-12 Page 216

Surrogate 13C2 PFDA
REPORTED %R 109

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 10.9
Surrogate TV 10.0
%R 109.0 MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS





Chain of Custody Record

410-93134 Chain of Custody

Client Contact: Andrew Kopchynski		Sampler: Andrew Kopchynski		Lab PM: Gordon, Stephen J		Carrier Tracking No(s)		COC No: 410-61650-17570.9							
Phone: (631) 316-4206		E-Mail: Stephen.Gordon@eurofinsus.com		State of Origin: WA		Page: 1 of 2		Page # of 28							
Company: Seres Engineering & Services LLC				PWSID		Analysis Requested									
Address: 669 Marina Drive Suite B7		Due Date Requested:		Field # Water Matrix # 537.1_DW - DW EPA 537.1 List of 18		Job # 30059933		Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Y - Trizma Z - other (specify)							
City: Charleston		TAT Requested (days): Standard													
State, Zip: SC, 29492		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No													
Phone: 720-344-3712(Tel)		PO #: D18-218 PFAS PA/SI													
Email: afkopchynski@seres-es.com		WO #: 3005993.YTC00													
Project Name: Yakima Training Center (YTC)		Project #: 41011531		SSOW#:		Special Instructions/Note: MS/MSD									
Site:		Sample Identification		Sample Date						Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=water/oil, BT=Tissue, A=Air)	
		YTC-OFFP-204-DW-072822		7/30/22						1330		G		Drinking Water	
		YTC-OFFP-183-DW-072822		07/28/22						1237		G		Drinking Water	
		YTC-OFFP-170-DW-072822								0912		G		Drinking Water	
		YTC-OFFP-208-DW-072822								1346		G		Drinking Water	
		YTC-OFFP-180-DW-072822								1119		G		Drinking Water	
		YTC-OFFP-FRB-04-072822								1535		G		Drinking Water	
		YTC-OFFP-171-DW-072822								0958		G		Drinking Water	
		YTC-OFFP-168-DW-072822								0951		G		Drinking Water	
		YTC-OFFP-289-DW-072822				1056		G		Drinking Water					
		YTC-OFFP-284-DW-072822				1044		G		Drinking Water					
		YTC-OFFP-169-DW-072822				1016		G		Drinking Water					
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)									
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months									
Deliverable Requested: I, II, III, IV, Other (specify)						Special Instructions/QC Requirements:									
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:									
Relinquished by: A. Rod/Staff		Date/Time: 7-28-22 / 1600		Company: SERES		Received by:		Date/Time:		Company:					
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:					
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time: 8/22/22 10:34		Company: ELET					
Custody Seals Intact:		Custody Seal No.:		Cooler Temperature(s) °C:		Other Remarks:									
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				13											

- 1
- 2
- 3
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- 7
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- 11
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- 13
- 14
- 15

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 410-93134-1

Login Number: 93134

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 1

Creator: Foreman, Kai

Question	Answer	Comment
The cooler's custody seal is intact.	True	
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 ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	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	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	Not present.
VOA sample vials do not have headspace $>6\text{mm}$ in diameter (none, if from WV)?	N/A	

Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93134-1

Qualifiers

LCMS

Qualifier	Qualifier Description
cn	Refer to Case Narrative for further detail
D	The reported value is from a dilution.
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
M	Manual integrated compound.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
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

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93134-1

Client Sample ID: YTC-OFFP-204-DW-072822

Lab Sample ID: 410-93134-1

Date Collected: 07/28/22 13:30

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
Perfluorobutanesulfonic acid	0.63	J cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
Perfluorohexanesulfonic acid	0.96	J cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
9CI-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
11CI-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 19:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100	cn	70 - 130	08/10/22 09:54	08/16/22 19:44	1
13C2 PFHxA	101	cn	70 - 130	08/10/22 09:54	08/16/22 19:44	1
13C3 HFPO-DA	97	cn	70 - 130	08/10/22 09:54	08/16/22 19:44	1
d5-NEtFOSAA	85	cn	70 - 130	08/10/22 09:54	08/16/22 19:44	1

Client Sample ID: YTC-OFFP-183-DW-072822

Lab Sample ID: 410-93134-2

Date Collected: 07/28/22 12:37

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
HFPODA	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
9CI-PF3ONS	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
11CI-PF3OUdS	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1
DONA	<1.3	cn	1.7	1.3	0.44	ng/L		08/16/22 19:55	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93134-1

Client Sample ID: YTC-OFFP-183-DW-072822

Lab Sample ID: 410-93134-2

Date Collected: 07/28/22 12:37

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	104	cn	70 - 130	08/10/22 09:54	08/16/22 19:55	1
13C2 PFHxA	102	cn	70 - 130	08/10/22 09:54	08/16/22 19:55	1
13C3 HFPO-DA	102	cn	70 - 130	08/10/22 09:54	08/16/22 19:55	1
d5-NEtFOSAA	91	cn	70 - 130	08/10/22 09:54	08/16/22 19:55	1

Client Sample ID: YTC-OFFP-170-DW-072822

Lab Sample ID: 410-93134-3

Date Collected: 07/28/22 09:12

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
9CI-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
11CI-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	98	cn	70 - 130	08/10/22 09:54	08/16/22 20:30	1
13C2 PFHxA	97	cn	70 - 130	08/10/22 09:54	08/16/22 20:30	1
13C3 HFPO-DA	94	cn	70 - 130	08/10/22 09:54	08/16/22 20:30	1
d5-NEtFOSAA	88	cn	70 - 130	08/10/22 09:54	08/16/22 20:30	1

Client Sample ID: YTC-OFFP-208-DW-072822

Lab Sample ID: 410-93134-4

Date Collected: 07/28/22 13:46

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
Perfluoroheptanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
Perfluorooctanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
Perfluorononanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
Perfluorodecanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
Perfluorotridecanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
Perfluorotetradecanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
Perfluorobutanesulfonic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
Perfluorohexanesulfonic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93134-1

Client Sample ID: YTC-OFFP-208-DW-072822

Lab Sample ID: 410-93134-4

Date Collected: 07/28/22 13:46

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
NEtFOSAA	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
NMeFOSAA	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
Perfluoroundecanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
Perfluorododecanoic acid	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
HFPODA	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
9Cl-PF3ONS	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
11Cl-PF3OUdS	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1
DONA	<1.4	cn	1.8	1.4	0.46	ng/L		08/16/22 20:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99	cn	70 - 130	08/10/22 09:54	08/16/22 20:42	1
13C2 PFHxA	94	cn	70 - 130	08/10/22 09:54	08/16/22 20:42	1
13C3 HFPO-DA	93	cn	70 - 130	08/10/22 09:54	08/16/22 20:42	1
d5-NEtFOSAA	83	cn	70 - 130	08/10/22 09:54	08/16/22 20:42	1

Client Sample ID: YTC-OFFP-180-DW-072822

Lab Sample ID: 410-93134-5

Date Collected: 07/28/22 11:19

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
Perfluorobutanesulfonic acid	0.46	J cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 20:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	93	cn	70 - 130	08/10/22 09:54	08/16/22 20:53	1
13C2 PFHxA	99	cn	70 - 130	08/10/22 09:54	08/16/22 20:53	1
13C3 HFPO-DA	95	cn	70 - 130	08/10/22 09:54	08/16/22 20:53	1
d5-NEtFOSAA	87	cn	70 - 130	08/10/22 09:54	08/16/22 20:53	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93134-1

Client Sample ID: YTC-OFFP-FRB-04-072822

Lab Sample ID: 410-93134-6

Date Collected: 07/28/22 15:35

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
9CI-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
11CI-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100	cn	70 - 130	08/10/22 09:54	08/16/22 21:05	1
13C2 PFHxA	93	cn	70 - 130	08/10/22 09:54	08/16/22 21:05	1
13C3 HFPO-DA	88	cn	70 - 130	08/10/22 09:54	08/16/22 21:05	1
d5-NEtFOSAA	100	cn	70 - 130	08/10/22 09:54	08/16/22 21:05	1

Client Sample ID: YTC-OFFP-171-DW-072822

Lab Sample ID: 410-93134-7

Date Collected: 07/28/22 09:58

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
HFPODA	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
9CI-PF3ONS	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
11CI-PF3OUdS	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1
DONA	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:28	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93134-1

Client Sample ID: YTC-OFFP-171-DW-072822

Lab Sample ID: 410-93134-7

Date Collected: 07/28/22 09:58

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	98	cn	70 - 130	08/10/22 09:54	08/16/22 21:28	1
13C2 PFHxA	100	cn	70 - 130	08/10/22 09:54	08/16/22 21:28	1
13C3 HFPO-DA	95	cn	70 - 130	08/10/22 09:54	08/16/22 21:28	1
d5-NEtFOSAA	96	cn	70 - 130	08/10/22 09:54	08/16/22 21:28	1

Client Sample ID: YTC-OFFP-168-DW-072822

Lab Sample ID: 410-93134-8

Date Collected: 07/28/22 09:51

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
Perfluorobutanesulfonic acid	0.46	J cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/16/22 21:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102	cn	70 - 130	08/10/22 09:54	08/16/22 21:39	1
13C2 PFHxA	98	cn	70 - 130	08/10/22 09:54	08/16/22 21:39	1
13C3 HFPO-DA	93	cn	70 - 130	08/10/22 09:54	08/16/22 21:39	1
d5-NEtFOSAA	100	cn	70 - 130	08/10/22 09:54	08/16/22 21:39	1

Client Sample ID: YTC-OFFP-289-DW-072822

Lab Sample ID: 410-93134-9

Date Collected: 07/28/22 10:56

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	51	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
Perfluoroheptanoic acid	18	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
Perfluorooctanoic acid	29	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
Perfluorononanoic acid	2.8	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
Perfluorobutanesulfonic acid	35	M cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93134-1

Client Sample ID: YTC-OFFP-289-DW-072822

Lab Sample ID: 410-93134-9

Date Collected: 07/28/22 10:56

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
NMeFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
HFPODA	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
9CI-PF3ONS	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
11CI-PF3OUdS	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1
DONA	<1.3	cn	1.7	1.3	0.43	ng/L		08/16/22 21:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102	cn	70 - 130	08/10/22 09:54	08/16/22 21:51	1
13C2 PFHxA	103	cn	70 - 130	08/10/22 09:54	08/16/22 21:51	1
13C3 HFPO-DA	100	cn	70 - 130	08/10/22 09:54	08/16/22 21:51	1
d5-NEtFOSAA	83	cn	70 - 130	08/10/22 09:54	08/16/22 21:51	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	290	HD DJ	17	13	4.3	ng/L		08/24/22 23:11	10
Perfluorooctanesulfonic acid	200	HD DJ	17	13	4.3	ng/L		08/24/22 23:11	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103		70 - 130	08/23/22 13:34	08/24/22 23:11	10
13C2 PFHxA	106		70 - 130	08/23/22 13:34	08/24/22 23:11	10
13C3 HFPO-DA	101		70 - 130	08/23/22 13:34	08/24/22 23:11	10
d5-NEtFOSAA	98		70 - 130	08/23/22 13:34	08/24/22 23:11	10

Client Sample ID: YTC-OFFP-284-DW-072822

Lab Sample ID: 410-93134-10

Date Collected: 07/28/22 10:44

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	46	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
Perfluoroheptanoic acid	17	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
Perfluorooctanoic acid	26	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
Perfluorononanoic acid	2.9	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
Perfluorodecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
Perfluorotridecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
Perfluorotetradecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
Perfluorobutanesulfonic acid	35	M cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
NEtFOSAA	<1.2	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
NMeFOSAA	<1.2	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
Perfluoroundecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
Perfluorododecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
HFPODA	<1.2	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
9CI-PF3ONS	<1.2	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
11CI-PF3OUdS	<1.2	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1
DONA	<1.2	cn	1.6	1.2	0.41	ng/L		08/16/22 22:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101	cn	70 - 130	08/10/22 09:54	08/16/22 22:02	1
13C2 PFHxA	102	cn	70 - 130	08/10/22 09:54	08/16/22 22:02	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93134-1

Client Sample ID: YTC-OFFP-284-DW-072822

Lab Sample ID: 410-93134-10

Date Collected: 07/28/22 10:44

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	98	cn	70 - 130	08/10/22 09:54	08/16/22 22:02	1
d5-NEtFOSAA	87	cn	70 - 130	08/10/22 09:54	08/16/22 22:02	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	280	D cn	16	12	4.1	ng/L		08/18/22 12:42	10
Perfluorooctanesulfonic acid	220	D cn	16	12	4.1	ng/L		08/18/22 12:42	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	84	cn	70 - 130	08/10/22 09:54	08/18/22 12:42	10
13C2 PFHxA	82	cn	70 - 130	08/10/22 09:54	08/18/22 12:42	10
13C3 HFPO-DA	85	cn	70 - 130	08/10/22 09:54	08/18/22 12:42	10
d5-NEtFOSAA	95	cn	70 - 130	08/10/22 09:54	08/18/22 12:42	10

Client Sample ID: YTC-OFFP-169-DW-072822

Lab Sample ID: 410-93134-11

Date Collected: 07/28/22 10:16

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	0.52	J cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
Perfluoroheptanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
Perfluorooctanoic acid	<1.3	M cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
Perfluorononanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
Perfluorobutanesulfonic acid	0.58	J cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
Perfluorohexanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
Perfluorooctanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
HFPODA	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
9Cl-PF3ONS	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
11Cl-PF3OUdS	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1
DONA	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101	cn	70 - 130	08/10/22 09:54	08/16/22 22:14	1
13C2 PFHxA	102	cn	70 - 130	08/10/22 09:54	08/16/22 22:14	1
13C3 HFPO-DA	98	cn	70 - 130	08/10/22 09:54	08/16/22 22:14	1
d5-NEtFOSAA	86	cn	70 - 130	08/10/22 09:54	08/16/22 22:14	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93134-1

Client Sample ID: YTC-OFFP-275-DW-072822

Lab Sample ID: 410-93134-12

Date Collected: 07/28/22 09:31

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	24	cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
Perfluorooctanoic acid	34	cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
Perfluorononanoic acid	1.3	J cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
Perfluorobutanesulfonic acid	29	M cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
HFPODA	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
9Cl-PF3ONS	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
11Cl-PF3OUdS	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1
DONA	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	109	cn	70 - 130	08/10/22 09:54	08/16/22 22:25	1
13C2 PFHxA	104	cn	70 - 130	08/10/22 09:54	08/16/22 22:25	1
13C3 HFPO-DA	102	cn	70 - 130	08/10/22 09:54	08/16/22 22:25	1
d5-NEtFOSAA	97	cn	70 - 130	08/10/22 09:54	08/16/22 22:25	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	59	D cn D	18	13	4.4	ng/L		08/18/22 12:54	10
Perfluorohexanesulfonic acid	170	D cn D	18	13	4.4	ng/L		08/18/22 12:54	10
Perfluorooctanesulfonic acid	150	D cn D	18	13	4.4	ng/L		08/18/22 12:54	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	81	cn	70 - 130	08/10/22 09:54	08/18/22 12:54	10
13C2 PFHxA	81	cn	70 - 130	08/10/22 09:54	08/18/22 12:54	10
13C3 HFPO-DA	85	cn	70 - 130	08/10/22 09:54	08/18/22 12:54	10
d5-NEtFOSAA	77	cn	70 - 130	08/10/22 09:54	08/18/22 12:54	10

Client Sample ID: YTC-OFFP-254-DW-072822

Lab Sample ID: 410-93134-13

Date Collected: 07/28/22 14:05

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
Perfluoroheptanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
Perfluorooctanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
Perfluorononanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
Perfluorodecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
Perfluorotridecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
Perfluorotetradecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
Perfluorobutanesulfonic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
Perfluorohexanesulfonic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
Perfluorooctanesulfonic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
NEtFOSAA	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93134-1

Client Sample ID: YTC-OFFP-254-DW-072822

Lab Sample ID: 410-93134-13

Date Collected: 07/28/22 14:05

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
NMeFOSAA	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
Perfluoroundecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
Perfluorododecanoic acid	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
HFPODA	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
9CI-PF3ONS	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
11CI-PF3OUdS	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1
DONA	<1.4	cn	1.8	1.4	0.45	ng/L		08/16/22 22:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	98	cn	70 - 130	08/10/22 09:54	08/16/22 22:37	1
13C2 PFHxA	97	cn	70 - 130	08/10/22 09:54	08/16/22 22:37	1
13C3 HFPO-DA	92	cn	70 - 130	08/10/22 09:54	08/16/22 22:37	1
d5-NEtFOSAA	81	cn	70 - 130	08/10/22 09:54	08/16/22 22:37	1

Client Sample ID: YTC-OFFP-FD-04-072822

Lab Sample ID: 410-93134-14

Date Collected: 07/28/22 12:00

Matrix: Drinking Water

Date Received: 08/02/22 10:34

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
Perfluoroheptanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
Perfluorooctanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
Perfluorononanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
Perfluorobutanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
Perfluorohexanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
Perfluorooctanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
HFPODA	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
9CI-PF3ONS	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
11CI-PF3OUdS	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1
DONA	<1.3	cn	1.8	1.3	0.44	ng/L		08/16/22 22:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	115	cn	70 - 130	08/10/22 09:54	08/16/22 22:48	1
13C2 PFHxA	108	cn	70 - 130	08/10/22 09:54	08/16/22 22:48	1
13C3 HFPO-DA	107	cn	70 - 130	08/10/22 09:54	08/16/22 22:48	1
d5-NEtFOSAA	102	cn	70 - 130	08/10/22 09:54	08/16/22 22:48	1

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #410-93136-1

Analyses Performed By:
Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report #46534R
Review Level: Stage 3/4
Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93136-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-175-DW-072822	410-93136-1	Water	7/28/2022		X
YTC-OFFP-181-DW-072822	410-93136-2	Water	7/28/2022		X
YTC-OFFP-217-DW-072822	410-93136-3	Water	7/28/2022		X
YTC-OFFP-176-DW-072822	410-93136-4	Water	7/28/2022		X
YTC-OFFP-209-DW-072822	410-93136-5	Water	7/28/2022		X
YTC-OFFP-185-DW-072822	410-93136-6	Water	7/28/2022		X
YTC-OFFP-186-DW-072822	410-93136-7	Water	7/28/2022		X
YTC-OFFP-184-DW-072822	410-93136-8	Water	7/28/2022		X
YTC-OFFP-172-DW-072822	410-93136-9	Water	7/28/2022		X
YTC-OFFP-234-DW-072822	410-93136-10	Water	7/28/2022		X
YTC-OFFP-179-DW-072822	410-93136-11	Water	7/28/2022		X
YTC-OFFP-178-DW-072822	410-93136-12	Water	7/28/2022		X
YTC-OFFP-174-DW-072822	410-93136-13	Water	7/28/2022		X
YTC-OFFP-213-DW-072822	410-93136-14	Water	7/28/2022		X
YTC-OFFP-177-DW-072822	410-93136-15	Water	7/28/2022		X
YTC-OFFP-182-DW-072822	410-93136-16	Water	7/28/2022		X
YTC-OFFP-173-DW-072822	410-93136-17	Water	7/28/2022		X

Note:

1. Stage 3/4 validation was performed on sample locations YTC-OFFP-217-DW-072822 and YTC-OFFP-213-DW-072822.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on a sample from another project.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

It was noted in the Case Narrative that the Field Sampler name was not listed on the Chain of Custody and that the container count received did not match the container count listed on the Chain of Custody. An additional 4 containers for samples YTC-OFFP-181-DW-072822 (410-93136-2) and YTC-OFFP-174-DW-072822 (410-93136-13), two additional containers each, was received.

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537.1, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Yakima, Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination. No field blanks were included with this sample set.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

DATA REVIEW REPORT

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in EPA method 537 version 2.0 Table 4.

The ion transitions were as specified in the method.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

An MS/MSD pair was not collected for a sample location associated with this SDG.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

A field duplicate was not collected for a sample location associated with this SDG.

DATA REVIEW REPORT

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-213-DW-072822	Perfluorohexanesulfonic acid (PFHxS)	--	98	98 D
	Perfluorooctanesulfonic acid (PFOS)	--	87	87 D

Note: The laboratory did not report the original analysis, only the diluted result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

10. System Performance and Overall Assessment

The laboratory qualified data with "cn" which is defined as "See case narrative." The case narrative was reviewed, and data qualified if appropriate. Hence the "cn" qualifier can be ignored since the qualifiers impact to the data has been accessed. The "cn" qualifier was removed in the database.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate(MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field Duplicate (RPD)	X				X
Surrogate Standard %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Moisture Content	X				X
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %Rs		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
D. Transcription/calculations acceptable		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

- %RSD Relative standard deviation
- %R Percent recovery
- RPD Relative percent difference
- %D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Sharon Pennington, Arcadis

SIGNATURE:



DATE: 08/22/2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: 8/22/2022

Tier 3
PFAS Calibration Standards %D

SDG #: J93136
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/22/2022
 Page: 1
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

PFOS 08/17/2022 Calibration Instrument 24743

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	39334	2395371	28.68	0.016421	1.01717	1.1661	0.403867	0.463	-12.772	-12.7	MATCH
0.926	84166	2415019	28.68	0.034851	1.079405	1.1661	0.857155	0.926	-7.435	-7.4	MATCH
2.31	248878	2531157	28.68	0.098326	1.220772	1.1661	2.418303	2.31	4.688	4.5	MATCH
4.63	441447	2322468	28.68	0.190077	1.177408	1.1661	4.674898	4.63	0.970	1	MATCH
18.5	1764607	2347698	28.68	0.751633	1.165234	1.1661	18.48626	18.5	-0.074	-0.1	MATCH
Avg RF					1.131998	No Match					

PFOS 08/15/2022 Calibration Instrument 24743

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	40522	2343719	28.68	0.01729	1.070985	1.2431	0.398895	0.463	-13.846	-13.8	MATCH
0.926	84332	2272090	28.68	0.037116	1.149569	1.2431	0.856328	0.926	-7.524	-7.5	MATCH
2.31	252534	2386019	28.68	0.105839	1.314054	1.2431	2.44185	2.31	5.708	5.5	MATCH
4.63	474684	2313129	28.68	0.205213	1.271168	1.2431	4.73454	4.63	2.258	2.3	MATCH
18.5	1824120	2286170	28.68	0.797893	1.23695	1.2431	18.40848	18.5	-0.495	-0.6	MATCH
Avg RF					1.208545	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: J93136
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/22/2022
 Page: 2
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

ICVL 410-287160/7 8/17/2022 21:26 Instrument 24743 Page 426

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % R	Reported % R
PFHxS	12024	2234596	28.68	0.0053808	1.1993	0.128677	0.114	112.87	113
PFOS	12499	2234596	28.68	0.0055934	1.1661	0.137569	0.116	118.59	119

Match
Match

ICV 410-287160/8 8/17/2022 21:38 Instrument 24743 Page 435

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D
PFHxS	221360	2390105	28.68	0.0926152	1.1993	2.214795	2.36	-6.15	-6.3
PFOS	216234	2390105	28.68	0.0904705	1.1661	2.225104	2.39	-6.90	-6.9

Match
Match

CCVLIS 410-286972/1 08/17/2022, 22:35 Instrument 24743 Page 441

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D
PFHxS	41699	2254635	28.68	0.0184948	1.1993	0.442283	0.456	-3.01	-3.0
PFOS	41715	2254635	28.68	0.0185019	1.1661	0.45505	0.463	-1.72	-1.7

Match
Match

CCVIS 410-286972/33 08/18/2022, 04:44 Instrument 24743 Page 447

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D
PFHxS	248082	2481687	28.68	0.0999651	1.1993	2.39056	2.28	4.85	4.8
PFOS	246506	2481687	28.68	0.09933	1.1661	2.443002	2.31	5.76	5.6

Match
Match

Concentration ng/ml = (Peak area ratio/slope) x IS concentration

Tier 3
PFAS LCS

SDG #: J93136
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/22/2022
Page: 3
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

LCS ID LCS 410-284596/2-A
LCSD ID LCS 410-284596/3-A
ANALYTE PFOS
REPORTED LCS %R 88
REPORTED LCSD %R 92
REPORTED RPD 5

Page: 104

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration 65.0
LCSD Concentration 68.3
LCS TV 74
LCSD TV 74

LCS %R 87.84 MATCH
LCSD %R 92.30 MATCH
RPD 4.95 MATCH

LCS ID LCS 410-284589/2-A
LCSD ID _____
ANALYTE PFOS
REPORTED LCS %R 82
REPORTED LCSD %R _____
REPORTED RPD _____

Page: 103

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

LCS Concentration 15.6
LCSD Concentration _____
LCS TV 19
LCSD TV _____

LCS %R 82.11 MATCH

Tier 3
PFAS Sample Concentration

SDG #: J93136
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/22/2022
 Page: 4
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-213-DW-72822 DL Lab ID: 410-93136-14 DL Page 220
 ICAL from 8/17 DF=10

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFHxS 10X	294108	2504334	28.68	0.11744	1.1993	2.81	1	286.2	98.13	98
PFOS 10X	254595	2504334	28.68	0.101662	1.1661	2.50	1	286.2	87.36	87

Match
Match

Sample ID: YTC-OFFP-217-DW-072822 Lab ID: 410-93136-3 Page 133
 ICAL from 8/15

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFOA	86161	3122387	10	0.027595	1.0499	0.26	1	308.8	0.85	0.85 J
PFBS	125060	2375262	28.7	0.052651	1.149	1.32	1	308.8	4.26	4.3
PFOS	21012	2375262	28.7	0.008846	1.2431	0.20	1	308.8	0.66	0.66 J

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: J93136
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/22/2022
Page: 5
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-213-DW-72822 DL Lab ID: 410-93136-14 DL Page 220

Surrogate d5-NEtFOSAA
REPORTED %R 95

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration: 37.8
Surrogate TV: 40.0
%R 94.5 MATCH

Sample ID: YTC-OFFP-217-DW-072822 Lab ID: 410-93136-3 Page 133

Surrogate 13C2 PFDA
REPORTED %R 99

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration: 9.92
Surrogate TV: 10.0
%R 99.2 MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS





Chain of Custody Record

410-93136 Chain of Custody

Client Contact: Andrew Kopchynski		Sampler Gordon, Stephen J	Lab PM Gordon, Stephen J	Carrier Tracking No(s)	COC No 410-61650-17570.6	
Company Seres Engineering & Services LLC		Phone	E-Mail Stephen.Gordon@et.eurofinsus.com	State of Origin	Page Page 6 of 25 1 of 2	
Address 669 Marina Drive Suite B7		Due Date Requested:		Analysis Requested		
City Charleston		TAT Requested (days):		Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Y - Trizma Z - other (specify)		
State, Zip SC, 29492		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No				
Phone 720-344-3712(Tel)		PO # D18-218 PFAS PA/SI				
Email afkopchynski@seres-es.com		WO # 3005993.YTC00				
Project Name Yakima Training Center (YTC)		Project # 41011531				
Site		SSOW#:		Job #:		
Sample Identification		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=soil, BT=Tissue, A=Air)	Special Instructions/Note:
YTC-OFFP- 175-DW-072822	07-28-22	0955	G	Drinking Water		
YTC-OFFP- 181-DW-072822	07-28-22	1030	G	Drinking Water		
YTC-OFFP- 217-DW-072822	07-28-22	1416	G	Drinking Water		
YTC-OFFP- 176-DW-072822	07-28-22	0924	G	Drinking Water		
YTC-OFFP- 209-DW-072822	07-28-22	1400	G	Drinking Water		
YTC-OFFP- 185-DW-072822	07-28-22	1101	G	Drinking Water		
YTC-OFFP- 186-DW-072822	07-28-22	1231	G	Drinking Water		
YTC-OFFP- 184-DW-072822	07-28-22	1247	G	Drinking Water		
YTC-OFFP- 172-DW-072822	07-28-22	1011	G	Drinking Water		
YTC-OFFP- 234-DW-072822	07-28-22	1330	G	Drinking Water		
YTC-OFFP- 179-DW-072822	07-28-22	1312	G	Drinking Water		
Possible Hazard Identification			Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)			
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological			<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Deliverable Requested: I, II, III, IV, Other (specify)			Special Instructions/QC Requirements:			
Empty Kit Relinquished by		Date:	Time:	Method of Shipment:		
Relinquished by: <i>Andrew Kop</i>		Date/Time: 7-28-22 1600	SEMERIS	Received by:		Company:
Relinquished by:		Date/Time:	Company:	Received by:		Company:
Relinquished by:		Date/Time:	Company:	Received by: <i>JM</i>		Company: <i>EUE</i>
Custody Seals Intact:	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 37°C				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

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Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 410-93136-1

Login Number: 93136

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 1

Creator: Foreman, Kai

Question	Answer	Comment
The cooler's custody seal is intact.	True	
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 ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
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	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Refer to Job Narrative for details.
Sample custody seals are intact.	N/A	Not present.
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	



Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93136-1

Qualifiers

LCMS

Qualifier	Qualifier Description
cn	Refer to Case Narrative for further detail
D	The reported value is from a dilution.
E	Result exceeded calibration range.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
M	Manual integrated compound.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
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

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93136-1

Client Sample ID: YTC-OFFP-175-DW-072822

Lab Sample ID: 410-93136-1

Date Collected: 07/28/22 09:55

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
Perfluoroheptanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
Perfluorooctanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
Perfluorononanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
Perfluorodecanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
Perfluorotridecanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
Perfluorotetradecanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
Perfluorobutanesulfonic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
Perfluorohexanesulfonic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
Perfluorooctanesulfonic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
NEtFOSAA	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
NMeFOSAA	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
Perfluoroundecanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
Perfluorododecanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
HFPODA	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
9Cl-PF3ONS	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
11Cl-PF3OUdS	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1
DONA	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	104	cn	70 - 130	08/10/22 09:54	08/16/22 23:11	1
13C2 PFHxA	101	cn	70 - 130	08/10/22 09:54	08/16/22 23:11	1
13C3 HFPO-DA	95	cn	70 - 130	08/10/22 09:54	08/16/22 23:11	1
d5-NEtFOSAA	88	cn	70 - 130	08/10/22 09:54	08/16/22 23:11	1

Client Sample ID: YTC-OFFP-181-DW-072822

Lab Sample ID: 410-93136-2

Date Collected: 07/28/22 10:30

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
Perfluoroheptanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
Perfluorooctanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
Perfluorononanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
Perfluorodecanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
Perfluorotridecanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
Perfluorotetradecanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
Perfluorobutanesulfonic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
Perfluorohexanesulfonic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
Perfluorooctanesulfonic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
NEtFOSAA	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
NMeFOSAA	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
Perfluoroundecanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
Perfluorododecanoic acid	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
HFPODA	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
9Cl-PF3ONS	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
11Cl-PF3OUdS	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1
DONA	<1.2	cn	1.7	1.2	0.41	ng/L		08/16/22 23:23	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93136-1

Client Sample ID: YTC-OFFP-181-DW-072822

Lab Sample ID: 410-93136-2

Date Collected: 07/28/22 10:30

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	106	cn	70 - 130	08/10/22 09:54	08/16/22 23:23	1
13C2 PFHxA	101	cn	70 - 130	08/10/22 09:54	08/16/22 23:23	1
13C3 HFPO-DA	96	cn	70 - 130	08/10/22 09:54	08/16/22 23:23	1
d5-NEtFOSAA	93	cn	70 - 130	08/10/22 09:54	08/16/22 23:23	1

Client Sample ID: YTC-OFFP-217-DW-072822

Lab Sample ID: 410-93136-3

Date Collected: 07/28/22 14:16

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	0.89	J M cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
Perfluoroheptanoic acid	<1.2	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
Perfluorooctanoic acid	0.85	J cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
Perfluorononanoic acid	<1.2	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
Perfluorodecanoic acid	<1.2	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
Perfluorotridecanoic acid	<1.2	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
Perfluorotetradecanoic acid	<1.2	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
Perfluorobutanesulfonic acid	4.3	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
Perfluorohexanesulfonic acid	0.44	J M cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
Perfluorooctanesulfonic acid	0.66	J cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
NEtFOSAA	<1.2	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
NMeFOSAA	<1.2	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
Perfluoroundecanoic acid	<1.2	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
Perfluorododecanoic acid	<1.2	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
HFPODA	<1.2	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
9Cl-PF3ONS	<1.2	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
11Cl-PF3OUdS	<1.2	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1
DONA	<1.2	cn	1.6	1.2	0.40	ng/L		08/16/22 23:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99	cn	70 - 130	08/10/22 09:54	08/16/22 23:35	1
13C2 PFHxA	101	cn	70 - 130	08/10/22 09:54	08/16/22 23:35	1
13C3 HFPO-DA	93	cn	70 - 130	08/10/22 09:54	08/16/22 23:35	1
d5-NEtFOSAA	101	cn	70 - 130	08/10/22 09:54	08/16/22 23:35	1

Client Sample ID: YTC-OFFP-176-DW-072822

Lab Sample ID: 410-93136-4

Date Collected: 07/28/22 09:24

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
Perfluoroheptanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
Perfluorooctanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
Perfluorononanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
Perfluorodecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
Perfluorotridecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
Perfluorotetradecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
Perfluorobutanesulfonic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
Perfluorohexanesulfonic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93136-1

Client Sample ID: YTC-OFFP-176-DW-072822

Lab Sample ID: 410-93136-4

Date Collected: 07/28/22 09:24

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
NEtFOSAA	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
NMeFOSAA	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
Perfluoroundecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
Perfluorododecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
HFPODA	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
9Cl-PF3ONS	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
11Cl-PF3OUdS	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1
DONA	<1.2	cn	1.6	1.2	0.41	ng/L		08/18/22 05:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	105	cn	70 - 130	08/10/22 09:58	08/18/22 05:42	1
13C2 PFHxA	100	cn	70 - 130	08/10/22 09:58	08/18/22 05:42	1
13C3 HFPO-DA	101	cn	70 - 130	08/10/22 09:58	08/18/22 05:42	1
d5-NEtFOSAA	82	cn	70 - 130	08/10/22 09:58	08/18/22 05:42	1

Client Sample ID: YTC-OFFP-209-DW-072822

Lab Sample ID: 410-93136-5

Date Collected: 07/28/22 14:00

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
Perfluoroheptanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
Perfluorooctanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
Perfluorononanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
Perfluorobutanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
Perfluorohexanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
Perfluorooctanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
HFPODA	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
9Cl-PF3ONS	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
11Cl-PF3OUdS	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1
DONA	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 05:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	94	cn	70 - 130	08/10/22 09:58	08/18/22 05:54	1
13C2 PFHxA	101	cn	70 - 130	08/10/22 09:58	08/18/22 05:54	1
13C3 HFPO-DA	100	cn	70 - 130	08/10/22 09:58	08/18/22 05:54	1
d5-NEtFOSAA	94	cn	70 - 130	08/10/22 09:58	08/18/22 05:54	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93136-1

Client Sample ID: YTC-OFFP-185-DW-072822

Lab Sample ID: 410-93136-6

Date Collected: 07/28/22 11:01

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
Perfluorobutanesulfonic acid	0.64	J cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
Perfluorohexanesulfonic acid	0.64	J cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
HFPODA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1
DONA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	104	cn	70 - 130	08/10/22 09:58	08/18/22 06:05	1
13C2 PFHxA	103	cn	70 - 130	08/10/22 09:58	08/18/22 06:05	1
13C3 HFPO-DA	103	cn	70 - 130	08/10/22 09:58	08/18/22 06:05	1
d5-NEtFOSAA	94	cn	70 - 130	08/10/22 09:58	08/18/22 06:05	1

Client Sample ID: YTC-OFFP-186-DW-072822

Lab Sample ID: 410-93136-7

Date Collected: 07/28/22 12:31

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
Perfluorobutanesulfonic acid	1.1	J cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
Perfluorohexanesulfonic acid	<1.3	M cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 06:17	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93136-1

Client Sample ID: YTC-OFFP-186-DW-072822

Lab Sample ID: 410-93136-7

Date Collected: 07/28/22 12:31

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100	cn	70 - 130	08/10/22 09:58	08/18/22 06:17	1
13C2 PFHxA	101	cn	70 - 130	08/10/22 09:58	08/18/22 06:17	1
13C3 HFPO-DA	98	cn	70 - 130	08/10/22 09:58	08/18/22 06:17	1
d5-NEtFOSAA	100	cn	70 - 130	08/10/22 09:58	08/18/22 06:17	1

Client Sample ID: YTC-OFFP-184-DW-072822

Lab Sample ID: 410-93136-8

Date Collected: 07/28/22 12:47

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
Perfluoroheptanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
Perfluorooctanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
Perfluorononanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
Perfluorobutanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
Perfluorohexanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
Perfluorooctanesulfonic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
HFPODA	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
9Cl-PF3ONS	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
11Cl-PF3OUdS	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1
DONA	<1.3	cn	1.8	1.3	0.44	ng/L		08/18/22 06:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102	cn	70 - 130	08/10/22 09:58	08/18/22 06:28	1
13C2 PFHxA	104	cn	70 - 130	08/10/22 09:58	08/18/22 06:28	1
13C3 HFPO-DA	104	cn	70 - 130	08/10/22 09:58	08/18/22 06:28	1
d5-NEtFOSAA	87	cn	70 - 130	08/10/22 09:58	08/18/22 06:28	1

Client Sample ID: YTC-OFFP-172-DW-072822

Lab Sample ID: 410-93136-9

Date Collected: 07/28/22 10:11

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93136-1

Client Sample ID: YTC-OFFP-172-DW-072822

Lab Sample ID: 410-93136-9

Date Collected: 07/28/22 10:11

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
HFPODA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1
DONA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	108	cn	70 - 130	08/10/22 09:58	08/18/22 06:40	1
13C2 PFHxA	103	cn	70 - 130	08/10/22 09:58	08/18/22 06:40	1
13C3 HFPO-DA	103	cn	70 - 130	08/10/22 09:58	08/18/22 06:40	1
d5-NEtFOSAA	87	cn	70 - 130	08/10/22 09:58	08/18/22 06:40	1

Client Sample ID: YTC-OFFP-234-DW-072822

Lab Sample ID: 410-93136-10

Date Collected: 07/28/22 13:30

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
HFPODA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1
DONA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 06:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102	cn	70 - 130	08/10/22 09:58	08/18/22 06:51	1
13C2 PFHxA	104	cn	70 - 130	08/10/22 09:58	08/18/22 06:51	1
13C3 HFPO-DA	105	cn	70 - 130	08/10/22 09:58	08/18/22 06:51	1
d5-NEtFOSAA	88	cn	70 - 130	08/10/22 09:58	08/18/22 06:51	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93136-1

Client Sample ID: YTC-OFFP-179-DW-072822

Lab Sample ID: 410-93136-11

Date Collected: 07/28/22 13:12

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99	cn	70 - 130	08/10/22 09:58	08/18/22 07:03	1
13C2 PFHxA	102	cn	70 - 130	08/10/22 09:58	08/18/22 07:03	1
13C3 HFPO-DA	101	cn	70 - 130	08/10/22 09:58	08/18/22 07:03	1
d5-NEtFOSAA	86	cn	70 - 130	08/10/22 09:58	08/18/22 07:03	1

Client Sample ID: YTC-OFFP-178-DW-072822

Lab Sample ID: 410-93136-12

Date Collected: 07/28/22 11:35

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
HFPODA	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1
DONA	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:14	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93136-1

Client Sample ID: YTC-OFFP-178-DW-072822

Lab Sample ID: 410-93136-12

Date Collected: 07/28/22 11:35

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100	cn	70 - 130	08/10/22 09:58	08/18/22 07:14	1
13C2 PFHxA	98	cn	70 - 130	08/10/22 09:58	08/18/22 07:14	1
13C3 HFPO-DA	98	cn	70 - 130	08/10/22 09:58	08/18/22 07:14	1
d5-NEtFOSAA	84	cn	70 - 130	08/10/22 09:58	08/18/22 07:14	1

Client Sample ID: YTC-OFFP-174-DW-072822

Lab Sample ID: 410-93136-13

Date Collected: 07/28/22 09:05

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 07:26	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	90	cn	70 - 130	08/10/22 09:58	08/18/22 07:26	1
13C2 PFHxA	101	cn	70 - 130	08/10/22 09:58	08/18/22 07:26	1
13C3 HFPO-DA	99	cn	70 - 130	08/10/22 09:58	08/18/22 07:26	1
d5-NEtFOSAA	80	cn	70 - 130	08/10/22 09:58	08/18/22 07:26	1

Client Sample ID: YTC-OFFP-213-DW-072822

Lab Sample ID: 410-93136-14

Date Collected: 07/28/22 14:34

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	16	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
Perfluoroheptanoic acid	6.9	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
Perfluorooctanoic acid	11	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
Perfluorononanoic acid	0.99	J cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
Perfluorobutanesulfonic acid	14	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93136-1

Client Sample ID: YTC-OFFP-213-DW-072822

Lab Sample ID: 410-93136-14

Date Collected: 07/28/22 14:34

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
NMeFOSAA	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
HFPODA	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1
DONA	<1.3	cn	1.7	1.3	0.44	ng/L		08/18/22 07:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	98	cn	70 - 130	08/10/22 09:58	08/18/22 07:49	1
13C2 PFHxA	105	cn	70 - 130	08/10/22 09:58	08/18/22 07:49	1
13C3 HFPO-DA	106	cn	70 - 130	08/10/22 09:58	08/18/22 07:49	1
d5-NEtFOSAA	80	cn	70 - 130	08/10/22 09:58	08/18/22 07:49	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	98	D cn	17	13	4.4	ng/L		08/18/22 13:17	10
Perfluorooctanesulfonic acid	87	D cn	17	13	4.4	ng/L		08/18/22 13:17	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	86	cn	70 - 130	08/10/22 09:58	08/18/22 13:17	10
13C2 PFHxA	94	cn	70 - 130	08/10/22 09:58	08/18/22 13:17	10
13C3 HFPO-DA	96	cn	70 - 130	08/10/22 09:58	08/18/22 13:17	10
d5-NEtFOSAA	95	cn	70 - 130	08/10/22 09:58	08/18/22 13:17	10

Client Sample ID: YTC-OFFP-177-DW-072822

Lab Sample ID: 410-93136-15

Date Collected: 07/28/22 10:49

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
Perfluorobutanesulfonic acid	0.69	J cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
Perfluorohexanesulfonic acid	1.1	J cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
HFPODA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1
DONA	<1.3	cn	1.7	1.3	0.43	ng/L		08/18/22 08:00	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93136-1

Client Sample ID: YTC-OFFP-177-DW-072822

Lab Sample ID: 410-93136-15

Date Collected: 07/28/22 10:49

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103	cn	70 - 130	08/10/22 09:58	08/18/22 08:00	1
13C2 PFHxA	100	cn	70 - 130	08/10/22 09:58	08/18/22 08:00	1
13C3 HFPO-DA	101	cn	70 - 130	08/10/22 09:58	08/18/22 08:00	1
d5-NEtFOSAA	86	cn	70 - 130	08/10/22 09:58	08/18/22 08:00	1

Client Sample ID: YTC-OFFP-182-DW-072822

Lab Sample ID: 410-93136-16

Date Collected: 07/28/22 11:19

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
Perfluoroheptanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
Perfluorooctanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
Perfluorononanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
Perfluorodecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
Perfluorotridecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
Perfluorotetradecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
Perfluorobutanesulfonic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
Perfluorohexanesulfonic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
Perfluorooctanesulfonic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
NEtFOSAA	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
NMeFOSAA	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
Perfluoroundecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
Perfluorododecanoic acid	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
HFPODA	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
9Cl-PF3ONS	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
11Cl-PF3OUdS	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1
DONA	<1.2	cn	1.7	1.2	0.42	ng/L		08/18/22 08:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	98	cn	70 - 130	08/10/22 09:58	08/18/22 08:12	1
13C2 PFHxA	99	cn	70 - 130	08/10/22 09:58	08/18/22 08:12	1
13C3 HFPO-DA	98	cn	70 - 130	08/10/22 09:58	08/18/22 08:12	1
d5-NEtFOSAA	97	cn	70 - 130	08/10/22 09:58	08/18/22 08:12	1

Client Sample ID: YTC-OFFP-173-DW-072822

Lab Sample ID: 410-93136-17

Date Collected: 07/28/22 09:41

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
Perfluoroheptanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
Perfluorooctanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
Perfluorobutanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
Perfluorohexanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93136-1

Client Sample ID: YTC-OFFP-173-DW-072822

Lab Sample ID: 410-93136-17

Date Collected: 07/28/22 09:41

Matrix: Drinking Water

Date Received: 08/02/22 11:10

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
HFPODA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1
DONA	<1.3	cn	1.7	1.3	0.42	ng/L		08/18/22 08:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	95	cn	70 - 130	08/10/22 09:58	08/18/22 08:24	1
13C2 PFHxA	101	cn	70 - 130	08/10/22 09:58	08/18/22 08:24	1
13C3 HFPO-DA	103	cn	70 - 130	08/10/22 09:58	08/18/22 08:24	1
d5-NEtFOSAA	91	cn	70 - 130	08/10/22 09:58	08/18/22 08:24	1

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #410-93621-1

Analyses Performed By:
Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report #46702R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93621-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-202-DW-080122	410-93621-1	Water	8/1/2022		X
YTC-OFFP-315-DW-080122	410-93621-2	Water	8/1/2022		X
YTC-OFFP-220-DW-080122	410-93621-3	Water	8/1/2022		X
YTC-OFFP-226-DW-080122	410-93621-4	Water	8/1/2022		X
YTC-OFFP-230-DW-080122	410-93621-5	Water	8/1/2022		X
YTC-OFFP-232-DW-080122	410-93621-6	Water	8/1/2022		X
YTC-OFFP-306-DW-080122	410-93621-7	Water	8/1/2022		X
YTC-OFFP-307-DW-080122	410-93621-8	Water	8/1/2022		X
YTC-OFFP-308-DW-080122	410-93621-9	Water	8/1/2022		X
YTC-OFFP-309-DW-080122	410-93621-10	Water	8/1/2022		X
YTC-OFFP-FRB-07-DW-080122	410-93621-11	Water	8/1/2022		X
YTC-OFFP-252-DW-080222	410-93621-12	Water	8/2/2022		X
YTC-OFFP-253-DW-080222	410-93621-13	Water	8/2/2022		X
YTC-OFFP-239-DW-080222	410-93621-14	Water	8/2/2022		X
YTC-OFFP-240-DW-080222	410-93621-15	Water	8/2/2022		X
YTC-OFFP-248-DW-080222	410-93621-16	Water	8/2/2022		X
YTC-OFFP-245-DW-080222	410-93621-17	Water	8/2/2022		X
YTC-OFFP-250-DW-080222	410-93621-18	Water	8/2/2022		X

Note:

1. Stage 3/4 validation was performed on sample locations YTC-OFFP-306-DW-080122 and YTC-OFFP-252-DW-080222.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Yakima, Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance was acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard. The initial calibration verification (ICV) standard recoveries must be within 70-130% of their true value.

The initial calibration met criteria, the calibration standards and initial calibration verification standard recoveries were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

DATA REVIEW REPORT

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in EPA method 537 version 2.0 Table 4.

The ion transitions were as specified in EPA method 537 version 2.0 Table 4.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS/MSD was not performed on a sample location associated with this SDG.

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

A field duplicate was not collected for a sample location associated with this SDG.

DATA REVIEW REPORT

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Note a number of results were manually integrated which were spot checked. The manual quantitation (M) laboratory qualifier has been preserved with the data as informational data for the end user; there was no impact on the data usability. The manual quantitation (M) laboratory qualifier associated with data reported as non-detect have been removed.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field reagent blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate(MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field Duplicate (RPD)	X				X
Surrogate Standard %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Stage 3/4 Validation					
System performance check		X		X	
Initial calibration %RSD/%R		X		X	
Continuing calibration %R/%D		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculations acceptable		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Reporting limits adjusted to reflect sample dilutions		X		X	

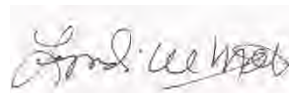
Notes:

- %RSD Relative standard deviation
- %R Percent recovery
- RPD Relative percent difference
- %D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Lyndi Mott, Arcadis

SIGNATURE:

A handwritten signature in black ink, appearing to read "Lyndi Mott", is written over a light gray rectangular background. The signature is cursive and somewhat stylized.

DATE: September 6, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: September 7, 2022

Tier 3
PFAS Calibration Standards %D

SDG #: J93621
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 9/6/2022
 Page: 1
 Validated by: LWM

Method: EPA Method 537.1, Version 2.0

PFOA 08/17/2022 Calibration Instrument 24743 Page 251

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.5	149752	3030120	10	0.049421	0.988423	1.0304	0.479631	0.5	-4.074	-4.1	MATCH
1	304866	3089344	10	0.098683	0.986831	1.0304	0.957716	1	-4.228	-4.2	MATCH
2.5	857821	3111379	10	0.275704	1.102818	1.0304	2.675703	2.5	7.028	7	MATCH
5	1520788	2938246	10	0.517584	1.035167	1.0304	5.023133	5	0.463	0.5	MATCH
20	6235229	3046477	10	2.046701	1.023351	1.0304	19.86317	20	-0.684	-0.7	MATCH
Avg RF					1.027318	No Match					

PFOS 08/22/2022 Calibration Instrument 24743 Page 318

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	36828	2062931	28.68	0.017852	1.105838	1.1787	0.434379	0.463	-6.182	-6.1	MATCH
0.926	75488	2038494	28.68	0.037031	1.146929	1.1787	0.901041	0.926	-2.695	-2.6	MATCH
2.31	222953	2092767	28.68	0.106535	1.322695	1.1787	2.592199	2.31	12.216	12.0	MATCH
4.63	400256	2108407	28.68	0.189838	1.17593	1.1787	4.61912	4.63	-0.235	-0.2	MATCH
18.5	1554219	2067450	28.68	0.751757	1.165426	1.1787	18.29166	18.5	-1.126	-1.2	MATCH
Avg RF					1.183364	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: J93621
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 9/6/2022
 Page: 2
 Validated by: LWM

Method: EPA Method 537.1, Version 2.0

ICV 410-287160/8 8/17/2022 21:38 Instrument 24743 Page 392

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFHxS	221360	2390105	28.68	0.092615	1.1993	2.214795	2.36	-6.15	-6.3	Match
PFOS	216234	2390105	28.68	0.090471	1.1661	2.225104	2.39	-6.90	-6.9	Match
PFOA	794880	2954589	10	0.269032	1.0304	2.610951	2.5	4.44	4.4	Match

CCVIS 410-287800/53 8/19/2022 20:55 Instrument 24743 Page 404

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFHxS	238230	2450557	28.68	0.097215	1.1993	2.324786	2.28	1.96	2.0	Match
PFOS	237692	2450557	28.68	0.096995	1.1661	2.385575	2.31	3.27	3.1	Match
PFOA	808242	2992334	10	0.270104	1.0304	2.621353	2.5	4.85	4.9	Match

ICV 410-287160/8 8/17/2022 21:38 Instrument 24743 Page 432

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	208551	2104409	28.68	0.099102	1.311	2.167997	2.21	-1.90	-2.0	Match
PFOS	188987	2104409	28.68	0.089805	1.1787	2.185132	2.39	-8.57	-8.6	Match
PFOA	578534	2138516	10	0.270531	1.0912	2.479203	2.5	-0.83	-0.8	Match

CCVIS 410-289227/34 8/24/2022 19:39 Instrument 24743 Page 466

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	219166	2323133	28.68	0.094341	1.311	2.063838	2.21	-6.61	-6.7	Match
PFOS	232569	2323133	28.68	0.10011	1.1787	2.435867	2.31	5.45	5.3	Match
PFOA	665558	2260575	10	0.29442	1.0912	2.698129	2.5	7.93	7.9	Match

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS LCS

SDG #: J93621
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 9/6/2022
Page: 3
Validated by: LWM

Method: EPA Method 537.1, Version 2.0

Page 107 and 109

LCS ID 410-286019/2 &3
ANALYTE PFBS
REPORTED LCS %R 82
REPORTED LCSD %R 78
REPORTED RPD 6

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration 58.3
LCSD Concentration 55.1
LCS TV 70.8
LCSD TV 70.8

LCS %R 82.34 MATCH
LCSD %R 77.82 MATCH
RPD 5.64 MATCH

Tier 3
PFAS Sample Concentration

SDG #: J93621
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 9/6/2022
 Page: 4
 Validated by: LWM

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-306-DW-080122 Lab ID: 410-93621-7 Page 164
 Instrument 24743 8/19/2022 23:02

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFHxS	61282	2548938	28.68	0.024042	1.1993	0.57	1	299.3	1.92	1.9
PFOS	29311	2548938	28.68	0.011499	1.1661	0.28	1	299.3	0.94	0.94 J
PFOA	50518	3141032	10	0.016083	1.0304	0.16	1	299.3	0.52	0.52 J

Match
Match
Match

Sample ID: YTC-OFFP-252-DW-080222 Lab ID: 410-93621-12 Page 200
 Instrument 24743 8/24/2022 20:25

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFBS	199601	2408525	28.68	0.082873	1.311	1.81	1	299.4	6.06	6.1
PFOS	1194127	2408525	28.68	0.495792	1.1787	12.06	1	299.4	40.29	40
PFOA	419879	2359591	10	0.177946	1.0912	1.63	1	299.4	5.45	5.4

Match
Match
Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: J93621
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 9/6/2022
Page: 5
Validated by: LWM

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-306-DW-080122 Lab ID: 410-93621-7

Surrogate 13C2 PFDA
REPORTED %R 97

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 9.72 Page 166
Surrogate TV 10.0
%R 97.2 MATCH

Sample ID: YTC-OFFP-252-DW-080222 Lab ID: 410-93621-12

Surrogate 13C3 HFPO-DA
REPORTED %R 93

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 9.26 Page 201
Surrogate TV 10.0
%R 92.6 MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

Client Information		Sampler <u>Andrew Kopchynski</u>		Lab PM: Gordon, Stephen J		Carrier Tracking No(s)		COC No 410-61650-17570.21	
Client Contact: Andrew Kopchynski		Phone: <u>(631) 316-4206</u>		E-Mail: Stephen.Gordon@eurofinsus.com		State of Origin: <u>WA</u>		Page <u>2</u> of <u>28</u>	
Company: Seres Engineering & Services LLC				PWSID		Analysis Requested			
Address: 669 Marina Drive Suite B7				Due Date Requested:		Job # <u>30059933</u> Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Y - Trizma Z - other (specify)			
City: Charleston		TAT Requested (days): <u>Normal</u>		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No					
State, Zip: SC, 29492		PO #: D18-218 PFAS PA/SI		WO #: 3005993 YTC00					
Phone: 720-344-3712(Tel)		Project #: 41011531		SSOW#:					
Email: afkopchynski@seres-es.com		Project Name: Yakima Training Center (YTC)		Site:					
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastewater, BT=Tissue, A=Air)	Special Instructions/Note:			
YTC-OFFP- <u>252-DW-080222</u>		<u>080222</u>	<u>1040</u>	<u>G</u>	<u>Drinking Water</u>	<u>N</u>	<u>N</u>	<u>2</u>	
YTC-OFFP- <u>253-DW-080222</u>		<u>080222</u>	<u>1057</u>	<u>G</u>	<u>Drinking Water</u>	<u>N</u>	<u>N</u>	<u>2</u>	
YTC-OFFP- <u>239-DW-080222</u>		<u>080222</u>	<u>1002</u>	<u>G</u>	<u>Drinking Water</u>	<u>N</u>	<u>N</u>	<u>2</u>	
YTC-OFFP- <u>240-DW-080222</u>		<u>080222</u>	<u>1129</u>	<u>G</u>	<u>Drinking Water</u>	<u>N</u>	<u>N</u>	<u>2</u>	
YTC-OFFP- <u>248-DW-080222</u>		<u>080222</u>	<u>1150</u>	<u>G</u>	<u>Drinking Water</u>	<u>N</u>	<u>N</u>	<u>2</u>	
YTC-OFFP- <u>245-DW-080222</u>		<u>080222</u>	<u>0917</u>	<u>G</u>	<u>Drinking Water</u>	<u>N</u>	<u>N</u>	<u>2</u>	
YTC-OFFP- <u>250-DW-080222</u>		<u>080222</u>	<u>1305</u>	<u>G</u>	<u>Drinking Water</u>	<u>N</u>	<u>N</u>	<u>2</u>	
YTC-OFFP-					<u>Drinking Water</u>				
YTC-OFFP-					<u>Drinking Water</u>				
YTC-OFFP-					<u>Drinking Water</u>				
YTC-OFFP-					<u>Drinking Water</u>				
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months				
Deliverable Requested: I, II, III, IV, Other (specify)					Special Instructions/QC Requirements:				
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:			
Relinquished by: <u>Bm Mc d</u>		Date/Time: <u>08/02/22 1505</u>		Company:		Received by:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time: <u>8/5/22 10:16</u>	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: <u>1.2</u>					

JM



Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 410-93621-1

Login Number: 93621

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 1

Creator: McCaskey, Jonathan

Question	Answer	Comment
The cooler's custody seal is intact.	True	
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 ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	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	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace $>6\text{mm}$ in diameter (none, if from WV)?	True	

Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93621-1

Qualifiers

LCMS

Qualifier	Qualifier Description
E	Result exceeded calibration range.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
M	Manual integrated compound.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
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

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93621-1

Client Sample ID: YTC-OFFP-202-DW-080122

Lab Sample ID: 410-93621-1

Date Collected: 08/01/22 09:18

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
Perfluorobutanesulfonic acid	1.1	J	1.8	1.3	0.45	ng/L		08/22/22 21:31	1
Perfluorohexanesulfonic acid	0.60	J	1.8	1.3	0.45	ng/L		08/22/22 21:31	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
NEtFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
NMeFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
HFPODA	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
9CI-PF3ONS	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1
DONA	<1.3		1.8	1.3	0.45	ng/L		08/22/22 21:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	107		70 - 130	08/15/22 11:11	08/22/22 21:31	1
13C2 PFHxA	106		70 - 130	08/15/22 11:11	08/22/22 21:31	1
13C3 HFPO-DA	100		70 - 130	08/15/22 11:11	08/22/22 21:31	1
d5-NEtFOSAA	85		70 - 130	08/15/22 11:11	08/22/22 21:31	1

Client Sample ID: YTC-OFFP-315-DW-080122

Lab Sample ID: 410-93621-2

Date Collected: 08/01/22 09:44

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
Perfluorobutanesulfonic acid	0.55	J	1.8	1.3	0.44	ng/L		08/22/22 21:42	1
Perfluorohexanesulfonic acid	1.8		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:42	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93621-1

Client Sample ID: YTC-OFFP-315-DW-080122

Lab Sample ID: 410-93621-2

Date Collected: 08/01/22 09:44

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	109		70 - 130	08/15/22 11:11	08/22/22 21:42	1
13C2 PFHxA	100		70 - 130	08/15/22 11:11	08/22/22 21:42	1
13C3 HFPO-DA	98		70 - 130	08/15/22 11:11	08/22/22 21:42	1
d5-NEtFOSAA	93		70 - 130	08/15/22 11:11	08/22/22 21:42	1

Client Sample ID: YTC-OFFP-220-DW-080122

Lab Sample ID: 410-93621-3

Date Collected: 08/01/22 10:04

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
Perfluoroheptanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
Perfluorooctanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
Perfluorononanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
Perfluorodecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
Perfluorotridecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
Perfluorotetradecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
Perfluorobutanesulfonic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
Perfluorohexanesulfonic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
Perfluorooctanesulfonic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
NEtFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
NMeFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
Perfluoroundecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
Perfluorododecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
HFPODA	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
9CI-PF3ONS	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
11CI-PF3OUdS	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1
DONA	<1.4		1.8	1.4	0.45	ng/L		08/19/22 22:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130	08/15/22 11:11	08/19/22 22:16	1
13C2 PFHxA	97		70 - 130	08/15/22 11:11	08/19/22 22:16	1
13C3 HFPO-DA	94		70 - 130	08/15/22 11:11	08/19/22 22:16	1
d5-NEtFOSAA	97		70 - 130	08/15/22 11:11	08/19/22 22:16	1

Client Sample ID: YTC-OFFP-226-DW-080122

Lab Sample ID: 410-93621-4

Date Collected: 08/01/22 10:24

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93621-1

Client Sample ID: YTC-OFFP-226-DW-080122

Lab Sample ID: 410-93621-4

Date Collected: 08/01/22 10:24

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 22:27	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130				08/15/22 11:11	08/19/22 22:27	1
13C2 PFHxA	97		70 - 130				08/15/22 11:11	08/19/22 22:27	1
13C3 HFPO-DA	96		70 - 130				08/15/22 11:11	08/19/22 22:27	1
d5-NEtFOSAA	87		70 - 130				08/15/22 11:11	08/19/22 22:27	1

Client Sample ID: YTC-OFFP-230-DW-080122

Lab Sample ID: 410-93621-5

Date Collected: 08/01/22 11:00

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	0.55	J	1.7	1.3	0.43	ng/L		08/19/22 22:39	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:39	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	97		70 - 130				08/15/22 11:11	08/19/22 22:39	1
13C2 PFHxA	98		70 - 130				08/15/22 11:11	08/19/22 22:39	1
13C3 HFPO-DA	97		70 - 130				08/15/22 11:11	08/19/22 22:39	1
d5-NEtFOSAA	97		70 - 130				08/15/22 11:11	08/19/22 22:39	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93621-1

Client Sample ID: YTC-OFFP-232-DW-080122

Lab Sample ID: 410-93621-6

Date Collected: 08/01/22 10:43

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	0.61	J	1.7	1.3	0.43	ng/L		08/19/22 22:50	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
Perfluorooctanoic acid	0.45	J	1.7	1.3	0.43	ng/L		08/19/22 22:50	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
Perfluorobutanesulfonic acid	0.43	J	1.7	1.3	0.43	ng/L		08/19/22 22:50	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 22:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102		70 - 130	08/15/22 11:11	08/19/22 22:50	1
13C2 PFHxA	98		70 - 130	08/15/22 11:11	08/19/22 22:50	1
13C3 HFPO-DA	99		70 - 130	08/15/22 11:11	08/19/22 22:50	1
d5-NEtFOSAA	92		70 - 130	08/15/22 11:11	08/19/22 22:50	1

Client Sample ID: YTC-OFFP-306-DW-080122

Lab Sample ID: 410-93621-7

Date Collected: 08/01/22 13:08

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	0.57	J	1.7	1.3	0.42	ng/L		08/19/22 23:02	1
Perfluoroheptanoic acid	0.44	J	1.7	1.3	0.42	ng/L		08/19/22 23:02	1
Perfluorooctanoic acid	0.52	J	1.7	1.3	0.42	ng/L		08/19/22 23:02	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 23:02	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 23:02	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 23:02	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 23:02	1
Perfluorobutanesulfonic acid	0.58	J	1.7	1.3	0.42	ng/L		08/19/22 23:02	1
Perfluorohexanesulfonic acid	1.9	J	1.7	1.3	0.42	ng/L		08/19/22 23:02	1
Perfluorooctanesulfonic acid	0.94	J	1.7	1.3	0.42	ng/L		08/19/22 23:02	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 23:02	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 23:02	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 23:02	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 23:02	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 23:02	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/19/22 23:02	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/19/22 23:02	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 23:02	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93621-1

Client Sample ID: YTC-OFFP-306-DW-080122

Lab Sample ID: 410-93621-7

Date Collected: 08/01/22 13:08

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	97		70 - 130	08/15/22 11:11	08/19/22 23:02	1
13C2 PFHxA	100		70 - 130	08/15/22 11:11	08/19/22 23:02	1
13C3 HFPO-DA	98		70 - 130	08/15/22 11:11	08/19/22 23:02	1
d5-NEtFOSAA	91		70 - 130	08/15/22 11:11	08/19/22 23:02	1

Client Sample ID: YTC-OFFP-307-DW-080122

Lab Sample ID: 410-93621-8

Date Collected: 08/01/22 12:37

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
Perfluoroheptanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
Perfluorooctanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
Perfluorononanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
Perfluorodecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
Perfluorotridecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
Perfluorotetradecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
Perfluorobutanesulfonic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
Perfluorohexanesulfonic acid	0.89	J	1.8	1.4	0.45	ng/L		08/19/22 23:13	1
Perfluorooctanesulfonic acid	0.90	J	1.8	1.4	0.45	ng/L		08/19/22 23:13	1
NEtFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
NMeFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
Perfluoroundecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
Perfluorododecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
HFPODA	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
9Cl-PF3ONS	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
11Cl-PF3OUdS	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1
DONA	<1.4		1.8	1.4	0.45	ng/L		08/19/22 23:13	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130	08/15/22 11:11	08/19/22 23:13	1
13C2 PFHxA	99		70 - 130	08/15/22 11:11	08/19/22 23:13	1
13C3 HFPO-DA	94		70 - 130	08/15/22 11:11	08/19/22 23:13	1
d5-NEtFOSAA	98		70 - 130	08/15/22 11:11	08/19/22 23:13	1

Client Sample ID: YTC-OFFP-308-DW-080122

Lab Sample ID: 410-93621-9

Date Collected: 08/01/22 13:53

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
Perfluorooctanoic acid	0.62	J M	1.8	1.3	0.44	ng/L		08/22/22 21:54	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
Perfluorobutanesulfonic acid	0.55	J	1.8	1.3	0.44	ng/L		08/22/22 21:54	1
Perfluorohexanesulfonic acid	1.3	J	1.8	1.3	0.44	ng/L		08/22/22 21:54	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93621-1

Client Sample ID: YTC-OFFP-308-DW-080122

Lab Sample ID: 410-93621-9

Date Collected: 08/01/22 13:53

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	2.1		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 21:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	110		70 - 130				08/15/22 11:11	08/22/22 21:54	1
13C2 PFHxA	101		70 - 130				08/15/22 11:11	08/22/22 21:54	1
13C3 HFPO-DA	97		70 - 130				08/15/22 11:11	08/22/22 21:54	1
d5-NEtFOSAA	101		70 - 130				08/15/22 11:11	08/22/22 21:54	1

Client Sample ID: YTC-OFFP-309-DW-080122

Lab Sample ID: 410-93621-10

Date Collected: 08/01/22 13:58

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.7		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
Perfluorooctanoic acid	1.1 J		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
Perfluorobutanesulfonic acid	3.0		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
Perfluorohexanesulfonic acid	1.0 J		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
Perfluorooctanesulfonic acid	1.1 J		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
NEtFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
NMeFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
HFPODA	<1.3		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
9CI-PF3ONS	<1.3		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
DONA	<1.3		1.7	1.3	0.44	ng/L		08/19/22 23:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	95		70 - 130				08/15/22 11:11	08/19/22 23:36	1
13C2 PFHxA	75		70 - 130				08/15/22 11:11	08/19/22 23:36	1
13C3 HFPO-DA	95		70 - 130				08/15/22 11:11	08/19/22 23:36	1
d5-NEtFOSAA	95		70 - 130				08/15/22 11:11	08/19/22 23:36	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93621-1

Client Sample ID: YTC-OFFP-FRB-07-DW-080122

Lab Sample ID: 410-93621-11

Date Collected: 08/01/22 13:38

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
Perfluoroheptanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
Perfluorooctanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
Perfluorononanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
Perfluorodecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
Perfluorotridecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
Perfluorotetradecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
Perfluorobutanesulfonic acid	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
Perfluorohexanesulfonic acid	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
Perfluorooctanesulfonic acid	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
NEtFOSAA	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
NMeFOSAA	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
Perfluoroundecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
Perfluorododecanoic acid	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
HFPODA	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
9CI-PF3ONS	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
11CI-PF3OUdS	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1
DONA	<1.2		1.7	1.2	0.42	ng/L		08/20/22 00:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	104		70 - 130	08/15/22 11:11	08/20/22 00:00	1
13C2 PFHxA	89		70 - 130	08/15/22 11:11	08/20/22 00:00	1
13C3 HFPO-DA	89		70 - 130	08/15/22 11:11	08/20/22 00:00	1
d5-NEtFOSAA	86		70 - 130	08/15/22 11:11	08/20/22 00:00	1

Client Sample ID: YTC-OFFP-252-DW-080222

Lab Sample ID: 410-93621-12

Date Collected: 08/02/22 10:40

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	16		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
Perfluoroheptanoic acid	5.3		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
Perfluorooctanoic acid	5.4 M		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
Perfluorobutanesulfonic acid	6.1		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
Perfluorohexanesulfonic acid	43		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
Perfluorooctanesulfonic acid	40		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:25	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:25	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93621-1

Client Sample ID: YTC-OFFP-252-DW-080222

Lab Sample ID: 410-93621-12

Date Collected: 08/02/22 10:40

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	105		70 - 130	08/15/22 16:26	08/24/22 20:25	1
13C2 PFHxA	94		70 - 130	08/15/22 16:26	08/24/22 20:25	1
13C3 HFPO-DA	93		70 - 130	08/15/22 16:26	08/24/22 20:25	1
d5-NEtFOSAA	93		70 - 130	08/15/22 16:26	08/24/22 20:25	1

Client Sample ID: YTC-OFFP-253-DW-080222

Lab Sample ID: 410-93621-13

Date Collected: 08/02/22 10:57

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	0.76	J	1.8	1.3	0.44	ng/L		08/26/22 12:37	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1
Perfluorooctanoic acid	0.46	J	1.8	1.3	0.44	ng/L		08/26/22 12:37	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1
Perfluorohexanesulfonic acid	1.7	J	1.8	1.3	0.44	ng/L		08/26/22 12:37	1
Perfluorooctanesulfonic acid	1.4	J	1.8	1.3	0.44	ng/L		08/26/22 12:37	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1
9Cl-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1
11Cl-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/26/22 12:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	78		70 - 130	08/15/22 16:26	08/26/22 12:37	1
13C2 PFHxA	72		70 - 130	08/15/22 16:26	08/26/22 12:37	1
13C3 HFPO-DA	72		70 - 130	08/15/22 16:26	08/26/22 12:37	1
d5-NEtFOSAA	72		70 - 130	08/15/22 16:26	08/26/22 12:37	1

Client Sample ID: YTC-OFFP-239-DW-080222

Lab Sample ID: 410-93621-14

Date Collected: 08/02/22 10:02

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93621-1

Client Sample ID: YTC-OFFP-239-DW-080222

Lab Sample ID: 410-93621-14

Date Collected: 08/02/22 10:02

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 20:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130				08/15/22 16:26	08/24/22 20:48	1
13C2 PFHxA	97		70 - 130				08/15/22 16:26	08/24/22 20:48	1
13C3 HFPO-DA	94		70 - 130				08/15/22 16:26	08/24/22 20:48	1
d5-NEtFOSAA	89		70 - 130				08/15/22 16:26	08/24/22 20:48	1

Client Sample ID: YTC-OFFP-240-DW-080222

Lab Sample ID: 410-93621-15

Date Collected: 08/02/22 11:29

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	104		70 - 130				08/15/22 16:26	08/24/22 21:00	1
13C2 PFHxA	96		70 - 130				08/15/22 16:26	08/24/22 21:00	1
13C3 HFPO-DA	94		70 - 130				08/15/22 16:26	08/24/22 21:00	1
d5-NEtFOSAA	85		70 - 130				08/15/22 16:26	08/24/22 21:00	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93621-1

Client Sample ID: YTC-OFFP-248-DW-080222

Lab Sample ID: 410-93621-16

Date Collected: 08/02/22 11:50

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
Perfluoroheptanoic acid	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
Perfluorooctanoic acid	1.1	J	1.6	1.2	0.41	ng/L		08/26/22 12:48	1
Perfluorononanoic acid	0.41	J	1.6	1.2	0.41	ng/L		08/26/22 12:48	1
Perfluorodecanoic acid	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
Perfluorotridecanoic acid	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
Perfluorotetradecanoic acid	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
Perfluorobutanesulfonic acid	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
Perfluorohexanesulfonic acid	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
Perfluorooctanesulfonic acid	0.49	J M	1.6	1.2	0.41	ng/L		08/26/22 12:48	1
NEtFOSAA	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
NMeFOSAA	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
Perfluoroundecanoic acid	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
Perfluorododecanoic acid	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
HFPODA	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
9CI-PF3ONS	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
11CI-PF3OUdS	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1
DONA	<1.2		1.6	1.2	0.41	ng/L		08/26/22 12:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103		70 - 130	08/15/22 16:26	08/26/22 12:48	1
13C2 PFHxA	95		70 - 130	08/15/22 16:26	08/26/22 12:48	1
13C3 HFPO-DA	94		70 - 130	08/15/22 16:26	08/26/22 12:48	1
d5-NEtFOSAA	95		70 - 130	08/15/22 16:26	08/26/22 12:48	1

Client Sample ID: YTC-OFFP-245-DW-080222

Lab Sample ID: 410-93621-17

Date Collected: 08/02/22 09:17

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:23	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93621-1

Client Sample ID: YTC-OFFP-245-DW-080222

Lab Sample ID: 410-93621-17

Date Collected: 08/02/22 09:17

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102		70 - 130	08/15/22 16:26	08/24/22 21:23	1
13C2 PFHxA	96		70 - 130	08/15/22 16:26	08/24/22 21:23	1
13C3 HFPO-DA	90		70 - 130	08/15/22 16:26	08/24/22 21:23	1
d5-NEtFOSAA	96		70 - 130	08/15/22 16:26	08/24/22 21:23	1

Client Sample ID: YTC-OFFP-250-DW-080222

Lab Sample ID: 410-93621-18

Date Collected: 08/02/22 13:05

Matrix: Drinking Water

Date Received: 08/05/22 10:16

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 21:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	107		70 - 130	08/15/22 16:26	08/24/22 21:35	1
13C2 PFHxA	100		70 - 130	08/15/22 16:26	08/24/22 21:35	1
13C3 HFPO-DA	94		70 - 130	08/15/22 16:26	08/24/22 21:35	1
d5-NEtFOSAA	97		70 - 130	08/15/22 16:26	08/24/22 21:35	1

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #410-93623-1

Analyses Performed By:
Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report #46596R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93623-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-285-DW-080422	410-93623-1	Water	08/04/2022		X
YTC-OFFP-287-DW-080422	410-93623-2	Water	08/04/2022		X
YTC-OFFP-278-DW-080422	410-93623-3	Water	08/04/2022		X
YTC-OFFP-256-DW-080422	410-93623-4	Water	08/04/2022		X
YTC-OFFP-288-DW-080422	410-93623-5	Water	08/04/2022		X
YTC-OFFP-290-DW-080422	410-93623-6	Water	08/04/2022		X
YTC-OFFP-279-DW-080422	410-93623-7	Water	08/04/2022		X
YTC-OFFP-310-DW-080422	410-93623-8	Water	08/04/2022		X
YTC-OFFP-311-DW-080422	410-93623-9	Water	08/04/2022		X
YTC-OFFP-262-DW-080322	410-93623-10	Water	08/03/2022		X
YTC-OFFP-271B-DW-080322	410-93623-11	Water	08/03/2022		X
YTC-OFFP-271A-DW-080322	410-93623-12	Water	08/03/2022		X
YTC-OFFP-258-DW-080322	410-93623-13	Water	08/03/2022		X
YTC-OFFP-322-DW-080322	410-93623-14	Water	08/03/2022		X
YTC-OFFP-270-DW-080322	410-93623-15	Water	08/03/2022		X

Note:

1. Stage 3/4 validation was performed on sample locations YTC-OFFP-258-DW-080322 and YTC-OFFP-270-DW-080322.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was not performed on sample location associated with this SDG.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

The case narrative noted that a field reagent blank was not submitted for analysis.

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Yakima, Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance was acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard. The initial calibration verification (ICV) standard recoveries must be within 70-130% of their true value.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

DATA REVIEW REPORT

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in EPA method 537 version 2.0 Table 4.

The ion transitions were as specified in EPA method 537 version 2.0 Table 4.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis was not performed on sample associated with this SDG.

7. Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS/LCSD analysis exhibited recoveries and RPDs within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

DATA REVIEW REPORT

A field duplicate was not collected for a sample location associated with this SDG.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compounds	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-285-DW-080422	Perfluorohexanesulfonic acid	--	180	180 D
	Perfluorooctanesulfonic acid	--	120	120 D
YTC-OFFP-287-DW-080422	Perfluorohexanesulfonic acid	--	63	63 D
YTC-OFFP-278-DW-080422	Perfluorohexanesulfonic acid	--	230	230 D
	Perfluorooctanesulfonic acid	--	150	150 D
YTC-OFFP-288-DW-080422	Perfluorohexanesulfonic acid	--	160	160 D
	Perfluorooctanesulfonic acid	--	98	98 D
YTC-OFFP-290-DW-080422	Perfluorohexanoic acid	--	60	60 D
	Perfluorohexanesulfonic acid	--	230	230 D
	Perfluorooctanesulfonic acid	--	160	160 D
YTC-OFFP-279-DW-080422	Perfluorohexanesulfonic acid	--	110	110 D
	Perfluorooctanesulfonic acid	--	67	67 D
YTC-OFFP-310-DW-080422	Perfluorohexanesulfonic acid	--	51	51 D
YTC-OFFP-271B-DW-080322	Perfluorohexanoic acid	--	100	100 D
	Perfluorohexanesulfonic acid	--	350	350 D
	Perfluorooctanesulfonic acid	--	280	280 D
YTC-OFFP-271A-DW-080322	Perfluorohexanoic acid	--	110	110 D
	Perfluorohexanesulfonic acid	--	350	350 D
	Perfluorooctanesulfonic acid	--	290	290 D

Note: The laboratory did not report the original analysis, only the diluted result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range.	D

DATA REVIEW REPORT

Note a number of results were manually integrated which were spot checked. The manual quantitation (M) laboratory qualifier has been preserved with the data as informational data for the end user; there was no impact on the data usability.

10. System Performance and Overall Assessment

Some of the compound results were qualified 'cn' that is defined as Refer to Case Narrative for further detail. The case narrative was reviewed, and associated data qualified if appropriate. The case narrative noted the lack of a field reagent blank. The associated sample results are not affected. Hence the "cn" qualifier can be ignored since the qualifiers impact to the data has been accessed and the qualifier has been removed in the database.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field reagent blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field Duplicate (RPD)	X				X
Surrogate Standard %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Stage 3/4 Validation					
System performance check		X		X	
Initial calibration %RSD/%R		X		X	
Continuing calibration %R/%D		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculations acceptable		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Pruthvi Kumar C, Arcadis

SIGNATURE:



DATE: August 29, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: August 29, 2022

Tier 3
PFAS Calibration Standards %D

SDG #: 410-93623-1
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/29/2022
 Page: 1
 Validated by: PK

Method: EPA Method 537.1, Version 2.0

PFOS, 08/17/2022 Calibration

Instrument 24743

Page: 317

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	39334	2395371	28.68	0.016421	1.01717	1.1661	0.4039	0.463	-12.772	-12.7	MATCH
0.926	84166	2415019	28.68	0.034851	1.079405	1.1661	0.8572	0.926	-7.435	-7.4	MATCH
2.31	248878	2531157	28.68	0.098326	1.220772	1.1661	2.4183	2.31	4.688	4.5	MATCH
4.63	441447	2322468	28.68	0.190077	1.177408	1.1661	4.6749	4.63	0.970	1	MATCH
18.5	1764607	2347698	28.68	0.751633	1.165234	1.1661	18.4863	18.5	-0.074	-0.1	MATCH
Avg RF					1.131998	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: 410-93623-1
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/29/2022
 Page: 2
 Validated by: PK

Method: EPA Method 537.1, Version 2.0

ICV 410-287160/8 8/17/2022 21:38:00 PM Instrument 24743 Page: 604

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	206807	2390105	28.68	0.086526	1.1325	2.191236	2.21	-0.85	-0.9	Match
PFOS	216234	2390105	28.68	0.090471	1.1661	2.225104	2.39	-6.90	-6.9	Match
PFOA	794880	2954589	10	0.269032	1.0304	2.610951	2.5	4.44	4.4	Match

CCVLIS 410-287800/1, 8/19/2022 11:19 Instrument 24743 Page 610

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	36327	2241249	28.68	0.016208	1.1325	0.41047	0.443	-7.34	-7.2	Match
PFOS	40312	2241249	28.68	0.017986	1.1661	0.44237	0.463	-4.46	-4.4	Match
PFOA	132858	2808196	10	0.047311	1.0304	0.45915	0.5	-8.17	-8.2	Match

CCVIS 410-287800/25 8/19/2022 15:44 Instrument 24743 Page 616

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	221929	2566761	28.68	0.086463	1.1325	2.18962	2.21	-0.92	-1.0	Match
PFOS	254483	2566761	28.68	0.099146	1.1661	2.43847	2.31	5.56	5.4	Match
PFOA	835111	3186425	10	0.262084	1.0304	2.54352	2.50	1.74	1.7	Match

Concentration ng/ml = (Peak area ratio/slope) x IS concentration

Tier 3
PFAS LCS LCSD

SDG #: 410-93623-1
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/29/2022
Page: 3
Validated by: PK

Method: EPA Method 537.1, Version 2.0

LCS ID 410-286472/2-A

Page 116

LCSD ID 410-286472/3-A

Page 119

ANALYTE PFHxA

REPORTED LCS %R 89

REPORTED LCSD %R 90

REPORTED RPD 2

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration 71.2

LCSD Concentration 72.2

LCS TV 80

LCSD TV 80

LCS %R 89.00 MATCH

LCSD %R 90.25 MATCH

RPD 1.39

Tier 3
PFAS Sample Concentration

SDG #: 410-93623-1
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/29/2022
 Page: 4
 Validated by: PK

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-258-DW-080322 Lab ID: 410-93623-13 Page 296
 Instrument: 24743 8/19/2022 17:16

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFBS	53706	2503745	28.68	0.02145	1.1325	0.54	1	288.1	1.89	1.9
PFOS	48303	2503745	28.68	0.019292	1.1661	0.47	1	288.1	1.65	1.6
PFOA	168667	3328098	10	0.05068	1.0304	0.49	1	288.1	1.71	1.7

Match
Match
Match

Sample ID: YTC-OFFP-270-DW-080322 Lab ID: 410-93623-15 Page 310
 Instrument: 24743 8/19/2022 17:39

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFBS	90431	2631305	28.68	0.034367	1.1325	0.87	1	299.7	2.90	2.9
PFOS	181868	2631305	28.68	0.069117	1.1661	1.70	1	299.7	5.67	5.7
PFOA	289184	3222646	10	0.089735	1.0304	0.87	1	299.7	2.91	2.9

Match
Match
Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: 410-93623-1
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/29/2022
Page: 5
Validated by: PK

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-258-DW-080322 Lab ID: 410-93623-13 Page 296

Surrogate 13C2 PFDA
REPORTED %R 97

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 9.73
Surrogate TV 10.0
%R 97.3 MATCH

Sample ID: YTC-OFFP-270-DW-080322 Lab ID: 410-93623-15 Page 310

Surrogate 13C2 PFHxA
REPORTED %R 100

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 9.98
Surrogate TV 10.0
%R 99.8 MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS



Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93623-1

Client Sample ID: YTC-OFFP-285-DW-080422

Lab Sample ID: 410-93623-1

Date Collected: 08/04/22 12:27

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	29		1.7	1.3	0.42	ng/L		08/19/22 05:01	1
Perfluoroheptanoic acid	10		1.7	1.3	0.42	ng/L		08/19/22 05:01	1
Perfluorooctanoic acid	18	M	1.7	1.3	0.42	ng/L		08/19/22 05:01	1
Perfluorononanoic acid	1.5	J	1.7	1.3	0.42	ng/L		08/19/22 05:01	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:01	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:01	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:01	1
Perfluorobutanesulfonic acid	25		1.7	1.3	0.42	ng/L		08/19/22 05:01	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:01	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:01	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:01	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:01	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:01	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:01	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:01	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130	08/16/22 15:19	08/19/22 05:01	1
13C2 PFHxA	99		70 - 130	08/16/22 15:19	08/19/22 05:01	1
13C3 HFPO-DA	97		70 - 130	08/16/22 15:19	08/19/22 05:01	1
d5-NEtFOSAA	95	M	70 - 130	08/16/22 15:19	08/19/22 05:01	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	180	D	17	13	4.2	ng/L		08/22/22 08:41	10
Perfluorooctanesulfonic acid	120	D	17	13	4.2	ng/L		08/22/22 08:41	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	105		70 - 130	08/16/22 15:19	08/22/22 08:41	10
13C2 PFHxA	101		70 - 130	08/16/22 15:19	08/22/22 08:41	10
13C3 HFPO-DA	111		70 - 130	08/16/22 15:19	08/22/22 08:41	10
d5-NEtFOSAA	104		70 - 130	08/16/22 15:19	08/22/22 08:41	10

Client Sample ID: YTC-OFFP-287-DW-080422

Lab Sample ID: 410-93623-2

Date Collected: 08/04/22 13:00

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	14		1.7	1.3	0.44	ng/L		08/19/22 05:13	1
Perfluoroheptanoic acid	5.6		1.7	1.3	0.44	ng/L		08/19/22 05:13	1
Perfluorooctanoic acid	8.4	M	1.7	1.3	0.44	ng/L		08/19/22 05:13	1
Perfluorononanoic acid	<1.3	M	1.7	1.3	0.44	ng/L		08/19/22 05:13	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 05:13	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 05:13	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 05:13	1
Perfluorobutanesulfonic acid	15		1.7	1.3	0.44	ng/L		08/19/22 05:13	1
Perfluorooctanesulfonic acid	59		1.7	1.3	0.44	ng/L		08/19/22 05:13	1
NEtFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/19/22 05:13	1
NMeFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/19/22 05:13	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93623-1

Client Sample ID: YTC-OFFP-287-DW-080422

Lab Sample ID: 410-93623-2

Date Collected: 08/04/22 13:00

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 05:13	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 05:13	1
HFPODA	<1.3		1.7	1.3	0.44	ng/L		08/19/22 05:13	1
9CI-PF3ONS	<1.3		1.7	1.3	0.44	ng/L		08/19/22 05:13	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.44	ng/L		08/19/22 05:13	1
DONA	<1.3		1.7	1.3	0.44	ng/L		08/19/22 05:13	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103		70 - 130	08/16/22 15:19	08/19/22 05:13	1
13C2 PFHxA	95		70 - 130	08/16/22 15:19	08/19/22 05:13	1
13C3 HFPO-DA	95		70 - 130	08/16/22 15:19	08/19/22 05:13	1
d5-NEtFOSAA	95		70 - 130	08/16/22 15:19	08/19/22 05:13	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	63	D	17	13	4.4	ng/L		08/22/22 08:52	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130	08/16/22 15:19	08/22/22 08:52	10
13C2 PFHxA	88		70 - 130	08/16/22 15:19	08/22/22 08:52	10
13C3 HFPO-DA	93		70 - 130	08/16/22 15:19	08/22/22 08:52	10
d5-NEtFOSAA	95		70 - 130	08/16/22 15:19	08/22/22 08:52	10

Client Sample ID: YTC-OFFP-278-DW-080422

Lab Sample ID: 410-93623-3

Date Collected: 08/04/22 09:17

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	66		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
Perfluoroheptanoic acid	26		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
Perfluorooctanoic acid	48	M	1.7	1.3	0.42	ng/L		08/19/22 05:24	1
Perfluorononanoic acid	3.3		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
Perfluorobutanesulfonic acid	37		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:24	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 05:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	114		70 - 130	08/16/22 15:19	08/19/22 05:24	1
13C2 PFHxA	111		70 - 130	08/16/22 15:19	08/19/22 05:24	1
13C3 HFPO-DA	105		70 - 130	08/16/22 15:19	08/19/22 05:24	1
d5-NEtFOSAA	91		70 - 130	08/16/22 15:19	08/19/22 05:24	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93623-1

Client Sample ID: YTC-OFFP-278-DW-080422

Lab Sample ID: 410-93623-3

Date Collected: 08/04/22 09:17

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	230	D	17	13	4.2	ng/L		08/22/22 09:04	10
Perfluorooctanesulfonic acid	150	D	17	13	4.2	ng/L		08/22/22 09:04	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	88		70 - 130	08/16/22 15:19	08/22/22 09:04	10
13C2 PFHxA	85		70 - 130	08/16/22 15:19	08/22/22 09:04	10
13C3 HFPO-DA	93		70 - 130	08/16/22 15:19	08/22/22 09:04	10
d5-NEtFOSAA	85		70 - 130	08/16/22 15:19	08/22/22 09:04	10

Client Sample ID: YTC-OFFP-256-DW-080422

Lab Sample ID: 410-93623-4

Date Collected: 08/04/22 09:28

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	2.8		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
Perfluoroheptanoic acid	1.2	J	1.7	1.3	0.43	ng/L		08/22/22 09:16	1
Perfluorooctanoic acid	1.2	J M	1.7	1.3	0.43	ng/L		08/22/22 09:16	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
Perfluorobutanesulfonic acid	3.2		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
Perfluorohexanesulfonic acid	18		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
Perfluorooctanesulfonic acid	2.0		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:16	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	97		70 - 130	08/16/22 15:19	08/22/22 09:16	1
13C2 PFHxA	91		70 - 130	08/16/22 15:19	08/22/22 09:16	1
13C3 HFPO-DA	97		70 - 130	08/16/22 15:19	08/22/22 09:16	1
d5-NEtFOSAA	94		70 - 130	08/16/22 15:19	08/22/22 09:16	1

Client Sample ID: YTC-OFFP-288-DW-080422

Lab Sample ID: 410-93623-5

Date Collected: 08/04/22 11:54

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	29		1.7	1.3	0.43	ng/L		08/22/22 09:27	1
Perfluoroheptanoic acid	12		1.7	1.3	0.43	ng/L		08/22/22 09:27	1
Perfluorooctanoic acid	20	M	1.7	1.3	0.43	ng/L		08/22/22 09:27	1
Perfluorononanoic acid	1.7		1.7	1.3	0.43	ng/L		08/22/22 09:27	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:27	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93623-1

Client Sample ID: YTC-OFFP-288-DW-080422

Lab Sample ID: 410-93623-5

Date Collected: 08/04/22 11:54

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:27	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:27	1
Perfluorobutanesulfonic acid	23		1.7	1.3	0.43	ng/L		08/22/22 09:27	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:27	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:27	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:27	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:27	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:27	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:27	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:27	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/22/22 09:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99		70 - 130	08/16/22 15:19	08/22/22 09:27	1
13C2 PFHxA	88		70 - 130	08/16/22 15:19	08/22/22 09:27	1
13C3 HFPO-DA	103		70 - 130	08/16/22 15:19	08/22/22 09:27	1
d5-NEtFOSAA	92		70 - 130	08/16/22 15:19	08/22/22 09:27	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	160	D	17	13	4.3	ng/L		08/22/22 09:39	10
Perfluorooctanesulfonic acid	98	D	17	13	4.3	ng/L		08/22/22 09:39	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	93		70 - 130	08/16/22 15:19	08/22/22 09:39	10
13C2 PFHxA	86		70 - 130	08/16/22 15:19	08/22/22 09:39	10
13C3 HFPO-DA	98		70 - 130	08/16/22 15:19	08/22/22 09:39	10
d5-NEtFOSAA	91		70 - 130	08/16/22 15:19	08/22/22 09:39	10

Client Sample ID: YTC-OFFP-290-DW-080422

Lab Sample ID: 410-93623-6

Date Collected: 08/04/22 11:23

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	27	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
Perfluorooctanoic acid	49	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
Perfluorononanoic acid	3.1	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
Perfluorobutanesulfonic acid	34	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
HFPODA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
9Cl-PF3ONS	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
11Cl-PF3OUdS	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1
DONA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 02:44	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93623-1

Client Sample ID: YTC-OFFP-290-DW-080422

Lab Sample ID: 410-93623-6

Date Collected: 08/04/22 11:23

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	106	cn	70 - 130	08/17/22 11:16	08/24/22 02:44	1
13C2 PFHxA	102	cn	70 - 130	08/17/22 11:16	08/24/22 02:44	1
13C3 HFPO-DA	95	cn	70 - 130	08/17/22 11:16	08/24/22 02:44	1
d5-NEtFOSAA	87	cn	70 - 130	08/17/22 11:16	08/24/22 02:44	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	60	D cn	18	13	4.4	ng/L		08/24/22 13:30	10
Perfluorohexanesulfonic acid	230	D cn	18	13	4.4	ng/L		08/24/22 13:30	10
Perfluorooctanesulfonic acid	160	D cn	18	13	4.4	ng/L		08/24/22 13:30	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	91	cn	70 - 130	08/17/22 11:16	08/24/22 13:30	10
13C2 PFHxA	82	cn	70 - 130	08/17/22 11:16	08/24/22 13:30	10
13C3 HFPO-DA	83	cn	70 - 130	08/17/22 11:16	08/24/22 13:30	10
d5-NEtFOSAA	87	cn	70 - 130	08/17/22 11:16	08/24/22 13:30	10

Client Sample ID: YTC-OFFP-279-DW-080422

Lab Sample ID: 410-93623-7

Date Collected: 08/04/22 09:41

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	37	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
Perfluoroheptanoic acid	15	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
Perfluorooctanoic acid	27	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
Perfluorononanoic acid	1.7	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
Perfluorodecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
Perfluorotridecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
Perfluorotetradecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
Perfluorobutanesulfonic acid	20	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
NEtFOSAA	<1.2	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
NMeFOSAA	<1.2	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
Perfluoroundecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
Perfluorododecanoic acid	<1.2	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
HFPODA	<1.2	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
9Cl-PF3ONS	<1.2	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
11Cl-PF3OUdS	<1.2	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1
DONA	<1.2	cn	1.6	1.2	0.41	ng/L		08/24/22 03:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101	cn	70 - 130	08/17/22 11:16	08/24/22 03:07	1
13C2 PFHxA	98	cn	70 - 130	08/17/22 11:16	08/24/22 03:07	1
13C3 HFPO-DA	93	cn	70 - 130	08/17/22 11:16	08/24/22 03:07	1
d5-NEtFOSAA	97	cn	70 - 130	08/17/22 11:16	08/24/22 03:07	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	110	D cn	16	12	4.1	ng/L		08/24/22 13:42	10
Perfluorooctanesulfonic acid	67	D cn	16	12	4.1	ng/L		08/24/22 13:42	10

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93623-1

Client Sample ID: YTC-OFFP-279-DW-080422

Lab Sample ID: 410-93623-7

Date Collected: 08/04/22 09:41

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	71	cn	70 - 130	08/17/22 11:16	08/24/22 13:42	10
13C2 PFHxA	66	S1- cn	70 - 130	08/17/22 11:16	08/24/22 13:42	10
13C3 HFPO-DA	67	S1- cn	70 - 130	08/17/22 11:16	08/24/22 13:42	10
d5-NEtFOSAA	69	S1- cn	70 - 130	08/17/22 11:16	08/24/22 13:42	10

Client Sample ID: YTC-OFFP-310-DW-080422

Lab Sample ID: 410-93623-8

Date Collected: 08/04/22 10:05

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	15	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
Perfluoroheptanoic acid	6.1	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
Perfluorooctanoic acid	9.1	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
Perfluorononanoic acid	0.88	J cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
Perfluorodecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
Perfluorotridecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
Perfluorotetradecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
Perfluorobutanesulfonic acid	14	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
Perfluorooctanesulfonic acid	59	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
NEtFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
NMeFOSAA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
Perfluoroundecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
Perfluorododecanoic acid	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
HFPODA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
9Cl-PF3ONS	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
11Cl-PF3OUdS	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1
DONA	<1.3	cn	1.8	1.3	0.44	ng/L		08/24/22 03:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	110	cn	70 - 130	08/17/22 11:16	08/24/22 03:19	1
13C2 PFHxA	101	cn	70 - 130	08/17/22 11:16	08/24/22 03:19	1
13C3 HFPO-DA	95	cn	70 - 130	08/17/22 11:16	08/24/22 03:19	1
d5-NEtFOSAA	101	cn	70 - 130	08/17/22 11:16	08/24/22 03:19	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	51	D cn	18	13	4.4	ng/L		08/24/22 13:53	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	73	cn	70 - 130	08/17/22 11:16	08/24/22 13:53	10
13C2 PFHxA	69	S1- cn	70 - 130	08/17/22 11:16	08/24/22 13:53	10
13C3 HFPO-DA	68	S1- cn	70 - 130	08/17/22 11:16	08/24/22 13:53	10
d5-NEtFOSAA	67	S1- cn	70 - 130	08/17/22 11:16	08/24/22 13:53	10

Client Sample ID: YTC-OFFP-311-DW-080422

Lab Sample ID: 410-93623-9

Date Collected: 08/04/22 10:22

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	6.5	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93623-1

Client Sample ID: YTC-OFFP-311-DW-080422

Lab Sample ID: 410-93623-9

Date Collected: 08/04/22 10:22

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	3.2	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
Perfluorooctanoic acid	4.8	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
Perfluorononanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
Perfluorodecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
Perfluorotridecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
Perfluorotetradecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
Perfluorobutanesulfonic acid	5.1	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
Perfluorohexanesulfonic acid	37	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
Perfluorooctanesulfonic acid	31	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
NEtFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
NMeFOSAA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
Perfluoroundecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
Perfluorododecanoic acid	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
HFPODA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
9Cl-PF3ONS	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
11Cl-PF3OUdS	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1
DONA	<1.3	cn	1.7	1.3	0.43	ng/L		08/24/22 03:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99	cn	70 - 130	08/17/22 11:16	08/24/22 03:30	1
13C2 PFHxA	99	cn	70 - 130	08/17/22 11:16	08/24/22 03:30	1
13C3 HFPO-DA	92	cn	70 - 130	08/17/22 11:16	08/24/22 03:30	1
d5-NEtFOSAA	90	cn	70 - 130	08/17/22 11:16	08/24/22 03:30	1

Client Sample ID: YTC-OFFP-262-DW-080322

Lab Sample ID: 410-93623-10

Date Collected: 08/03/22 10:36

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	5.7		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
Perfluoroheptanoic acid	2.2		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
Perfluorooctanoic acid	5.0	M	1.7	1.3	0.44	ng/L		08/19/22 16:41	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
Perfluorobutanesulfonic acid	4.0		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
Perfluorohexanesulfonic acid	21		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
Perfluorooctanesulfonic acid	9.2		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
NEtFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
NMeFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
HFPODA	<1.3		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.44	ng/L		08/19/22 16:41	1
DONA	<1.3		1.7	1.3	0.44	ng/L		08/19/22 16:41	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93623-1

Client Sample ID: YTC-OFFP-262-DW-080322

Lab Sample ID: 410-93623-10

Date Collected: 08/03/22 10:36

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130	08/16/22 11:16	08/19/22 16:41	1
13C2 PFHxA	96		70 - 130	08/16/22 11:16	08/19/22 16:41	1
13C3 HFPO-DA	97		70 - 130	08/16/22 11:16	08/19/22 16:41	1
d5-NEtFOSAA	101		70 - 130	08/16/22 11:16	08/19/22 16:41	1

Client Sample ID: YTC-OFFP-271B-DW-080322

Lab Sample ID: 410-93623-11

Date Collected: 08/03/22 11:06

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	36		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
Perfluorooctanoic acid	62		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
Perfluorononanoic acid	3.3		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
Perfluorobutanesulfonic acid	50		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
9Cl-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
11Cl-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/19/22 16:53	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 16:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	92		70 - 130	08/16/22 11:16	08/19/22 16:53	1
13C2 PFHxA	94		70 - 130	08/16/22 11:16	08/19/22 16:53	1
13C3 HFPO-DA	96		70 - 130	08/16/22 11:16	08/19/22 16:53	1
d5-NEtFOSAA	76		70 - 130	08/16/22 11:16	08/19/22 16:53	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	100	D	18	13	4.4	ng/L		08/22/22 19:59	10
Perfluorohexanesulfonic acid	350	D	18	13	4.4	ng/L		08/22/22 19:59	10
Perfluorooctanesulfonic acid	280	D	18	13	4.4	ng/L		08/22/22 19:59	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	86		70 - 130	08/16/22 11:16	08/22/22 19:59	10
13C2 PFHxA	87		70 - 130	08/16/22 11:16	08/22/22 19:59	10
13C3 HFPO-DA	84		70 - 130	08/16/22 11:16	08/22/22 19:59	10
d5-NEtFOSAA	76		70 - 130	08/16/22 11:16	08/22/22 19:59	10

Client Sample ID: YTC-OFFP-271A-DW-080322

Lab Sample ID: 410-93623-12

Date Collected: 08/03/22 10:53

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	37		1.7	1.3	0.43	ng/L		08/19/22 17:05	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93623-1

Client Sample ID: YTC-OFFP-271A-DW-080322

Lab Sample ID: 410-93623-12

Date Collected: 08/03/22 10:53

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanoic acid	61		1.7	1.3	0.43	ng/L		08/19/22 17:05	1
Perfluorononanoic acid	3.1		1.7	1.3	0.43	ng/L		08/19/22 17:05	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:05	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:05	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:05	1
Perfluorobutanesulfonic acid	56		1.7	1.3	0.43	ng/L		08/19/22 17:05	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:05	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:05	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:05	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:05	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:05	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:05	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:05	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	96		70 - 130	08/16/22 11:16	08/19/22 17:05	1
13C2 PFHxA	99		70 - 130	08/16/22 11:16	08/19/22 17:05	1
13C3 HFPO-DA	101		70 - 130	08/16/22 11:16	08/19/22 17:05	1
d5-NEtFOSAA	91		70 - 130	08/16/22 11:16	08/19/22 17:05	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	110	D	17	13	4.3	ng/L		08/22/22 20:10	10
Perfluorohexanesulfonic acid	350	D	17	13	4.3	ng/L		08/22/22 20:10	10
Perfluorooctanesulfonic acid	290	D	17	13	4.3	ng/L		08/22/22 20:10	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	92		70 - 130	08/16/22 11:16	08/22/22 20:10	10
13C2 PFHxA	96		70 - 130	08/16/22 11:16	08/22/22 20:10	10
13C3 HFPO-DA	91		70 - 130	08/16/22 11:16	08/22/22 20:10	10
d5-NEtFOSAA	84		70 - 130	08/16/22 11:16	08/22/22 20:10	10

Client Sample ID: YTC-OFFP-258-DW-080322

Lab Sample ID: 410-93623-13

Date Collected: 08/03/22 09:45

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	4.1		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
Perfluoroheptanoic acid	1.2	J	1.7	1.3	0.43	ng/L		08/19/22 17:16	1
Perfluorooctanoic acid	1.7		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
Perfluorobutanesulfonic acid	1.9		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
Perfluorohexanesulfonic acid	8.6		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
Perfluorooctanesulfonic acid	1.6	J	1.7	1.3	0.43	ng/L		08/19/22 17:16	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:16	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93623-1

Client Sample ID: YTC-OFFP-258-DW-080322

Lab Sample ID: 410-93623-13

Date Collected: 08/03/22 09:45

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:16	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 17:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	97		70 - 130	08/16/22 11:16	08/19/22 17:16	1
13C2 PFHxA	98		70 - 130	08/16/22 11:16	08/19/22 17:16	1
13C3 HFPO-DA	95		70 - 130	08/16/22 11:16	08/19/22 17:16	1
d5-NEtFOSAA	91		70 - 130	08/16/22 11:16	08/19/22 17:16	1

Client Sample ID: YTC-OFFP-322-DW-080322

Lab Sample ID: 410-93623-14

Date Collected: 08/03/22 10:04

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	97		70 - 130	08/16/22 11:16	08/19/22 17:28	1
13C2 PFHxA	100		70 - 130	08/16/22 11:16	08/19/22 17:28	1
13C3 HFPO-DA	99		70 - 130	08/16/22 11:16	08/19/22 17:28	1
d5-NEtFOSAA	85		70 - 130	08/16/22 11:16	08/19/22 17:28	1

Client Sample ID: YTC-OFFP-270-DW-080322

Lab Sample ID: 410-93623-15

Date Collected: 08/03/22 10:40

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	4.7		1.7	1.3	0.42	ng/L		08/19/22 17:39	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93623-1

Client Sample ID: YTC-OFFP-270-DW-080322

Lab Sample ID: 410-93623-15

Date Collected: 08/03/22 10:40

Matrix: Drinking Water

Date Received: 08/05/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	1.7		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
Perfluorooctanoic acid	2.9		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
Perfluorobutanesulfonic acid	2.9		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
Perfluorohexanesulfonic acid	13		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
Perfluorooctanesulfonic acid	5.7		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:39	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/19/22 17:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	98		70 - 130	08/16/22 11:16	08/19/22 17:39	1
13C2 PFHxA	100		70 - 130	08/16/22 11:16	08/19/22 17:39	1
13C3 HFPO-DA	97		70 - 130	08/16/22 11:16	08/19/22 17:39	1
d5-NEtFOSAA	102		70 - 130	08/16/22 11:16	08/19/22 17:39	1

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #410-93629-1

Analyses Performed By:
Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report #46585R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93629-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-266-DW-080322	410-93629-1	Water	8/3/2022		X
YTC-OFFP-272-DW-080322	410-93629-2	Water	8/3/2022		X
YTC-OFFP-82-DW-080322	410-93629-3	Water	8/3/2022		X
YTC-OFFP-304-DW-080322	410-93629-4	Water	8/3/2022		X
YTC-OFFP-FRB-09-DW-080322	410-93629-5	Water	8/3/2022		X
YTC-OFFP-FRB-10-DW-080422	410-93629-6	Water	8/4/2022		X
YTC-OFFP-276-DW-080422	410-93629-7	Water	8/4/2022		X
YTC-OFFP-273-DW-080422	410-93629-8	Water	8/4/2022		X
YTC-OFFP-277-DW-080422	410-93629-9	Water	8/4/2022		X
YTC-OFFP-282-DW-080422	410-93629-10	Water	8/4/2022		X
YTC-OFFP-286-DW-080422	410-93629-11	Water	8/4/2022		X
YTC-OFFP-291-DW-080422	410-93629-12	Water	8/4/2022		X
YTC-OFFP-FD-09-080422	410-93629-13	Water	8/4/2022	YTC-OFFP-282-DW-080422	X

Note:

1. Stage 3/4 validation was performed on sample locations YTC-OFFP-82-DW-080322 and YTC-OFFP-291-DW-080422.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location YTC-OFFP-282-DW-080422.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X	X		
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): YTC-OFFP-FRB-10-DW-080422 (410-93629-6). The container labels list YTC-OFFP-FRB-09-DW-080322, while the COC lists YTC-OFFP-FRB-10-DW-080422. The sample ID was entered per COC.

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Yakima, Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance was acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

DATA REVIEW REPORT

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in EPA method 537 version 2.0 Table 4.

The ion transitions were as specified in EPA method 537 version 2.0 Table 4.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis performed on sample location YTC-OFFP-282-DW-080422 exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

7. Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

DATA REVIEW REPORT

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
YTC-OFFP-282-DW-080422/ YTC-OFFP-FD-09-080422	Perfluorohexanoic acid	3.7	3.7	AC
	Perfluoroheptanoic acid	1.6 J	1.7	AC
	Perfluorooctanoic acid	3.7	3.8	AC
	Perfluorobutanesulfonic acid	9.1	9.7	6.4%
	Perfluorohexanesulfonic acid	33	34	3.0%
	Perfluorooctanesulfonic acid	11	11	0.0%

Notes:

AC Acceptable

The calculated RPD and results between the parent sample and field duplicate were acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-82-DW-080322	Perfluorohexane sulfonic acid	--	340	340 D
	Perfluorooctane sulfonic acid	--	340	340 D
YTC-OFFP-304-DW-080322	Perfluorohexane sulfonic acid	--	97	97 D
	Perfluorooctane sulfonic acid	--	67	67 D

Note: The laboratory did not report the original analysis, only the diluted result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range.	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range.	EDJ
Original sample result greater than the calibration range	EJ

DATA REVIEW REPORT

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field reagent blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate Standard %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Stage 3/4 Validation					
System performance check		X		X	
Initial calibration %RSD/%R		X		X	
Continuing calibration %R/%D		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculations acceptable		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

- %RSD Relative standard deviation
- %R Percent recovery
- RPD Relative percent difference
- %D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Lyndi Mott, Arcadis

SIGNATURE:

A handwritten signature in black ink, appearing to read "Lyndi Mott", is written over a light pink rectangular background. Below the signature is a solid black horizontal line.

DATE: August 26, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: August 29, 2022

Tier 3
PFAS Calibration Standards %D

SDG #: J93629
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/26/2022
 Page: 1
 Validated by: LWM

Method: EPA Method 537.1, Version 2.0

PFOS, 08/17/2022 Calibration Instrument 24743 Page: 240

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	39334	2395371	28.68	0.016421	1.01717	1.1661	0.4039	0.463	-12.772	-12.7	MATCH
0.926	84166	2415019	28.68	0.034851	1.079405	1.1661	0.8572	0.926	-7.435	-7.4	MATCH
2.31	248878	2531157	28.68	0.098326	1.220772	1.1661	2.4183	2.31	4.688	4.5	MATCH
4.63	441447	2322468	28.68	0.190077	1.177408	1.1661	4.6749	4.63	0.970	1	MATCH
18.5	1764607	2347698	28.68	0.751633	1.165234	1.1661	18.4863	18.5	-0.074	-0.1	MATCH
Avg RF					1.131998	No Match					

PFOS, 08/22/2022 Calibration Instrument 24743 Page: 307

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	36828	2062931	28.68	0.017852	1.105838	1.1787	0.4344	0.463	-6.182	-6.1	MATCH
0.926	75488	2038494	28.68	0.037031	1.146929	1.1787	0.9010	0.926	-2.695	-2.6	MATCH
2.31	222953	2092767	28.68	0.106535	1.322695	1.1787	2.5922	2.31	12.216	12	MATCH
4.63	400256	2108407	28.68	0.189838	1.17593	1.1787	4.6191	4.63	-0.235	-0.2	MATCH
18.5	1554219	2067450	28.68	0.751757	1.165426	1.1787	18.2917	18.5	-1.126	-1.2	MATCH
Avg RF					1.183364	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: J93629
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/26/2022
 Page: 2
 Validated by: LWM

Method: EPA Method 537.1, Version 2.0

ICV 410-287160/8 8/17/2022 21:38:00 PM Instrument 24743 Page: 381

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	206807	2390105	28.68	0.086526	1.1325	2.191236	2.21	-0.85	-0.9	Match
PFOS	216234	2390105	28.68	0.090471	1.1661	2.225104	2.39	-6.90	-6.9	Match
PFOA	794880	2954589	10	0.269032	1.0304	2.610951	2.5	4.44	4.4	Match

CCVLIS 410-287800/1, 8/19/2022 11:19 Instrument 24743 Page 387

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	36327	2241249	28.68	0.016208	1.1325	0.41047	0.443	-7.34	-7.2	Match
PFOS	40312	2241249	28.68	0.017986	1.1661	0.44237	0.463	-4.46	-4.4	Match
PFOA	132858	2808196	10	0.047311	1.0304	0.45915	0.5	-8.17	-8.2	Match

ICV 410-288402/8 8/22/2022 13:49 Instrument 24743 Page: 444

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	208551	2104409	28.68	0.099102	1.311	2.167997	2.21	-1.90	-2	Match
PFOS	188987	2104409	28.68	0.089805	1.1787	2.185132	2.39	-8.57	-8.6	Match
PFOA	578534	2138516	10	0.270531	1.0912	2.479203	2.5	-0.83	-0.8	Match

CCVIS 410-288425/25 8/22/2022 19:47 Instrument 24743 Page 459

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	1658487	2056301	28.68	0.806539	1.311	17.64419	17.7	-0.32	-0.3	Match
PFOS	1557197	2056301	28.68	0.757281	1.1787	18.42607	18.5	-0.40	-0.4	Match
PFOA	4465567	2039277	10	2.18978	1.0912	20.06763	20	0.34	0.3	Match

Concentration ng/ml = (Peak area ratio/slope) x IS concentration

Tier 3
PFAS LCS

SDG #: J93629
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/26/2022
Page: 3
Validated by: LWM

Method: EPA Method 537.1, Version 2.0

LCS ID 410-286958/2-A

Page 109 and 112

ANALYTE PFOA

REPORTED LCS %R 99

REPORTED LCSD %R 105

REPORTED RPD 6

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration 20.3

LCSD Concentration 21.6

LCS TV 20.5

LCSD TV 20.5

LCS %R 99.02 MATCH

LCSD %R 105.37 MATCH

RPD 6.21

Tier 3
PFAS MS/MSD

SDG #: J93629
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/26/2022
Page: 4
Validated by: LWM

Method: EPA Method 537.1, Version 2.0

MS/MSD Sample ID YTC-OFFP-282-DW-080422

ANALYTE PFOS

REPORTED MS %R 97

REPORTED MSD %R 105

REPORTED RPD 5

$$\%R = \frac{100 * \text{MS Concentration}}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * | \text{MS \%R} - \text{MSD \%R} |}{\text{Average of MS MSD \%R}}$$

Sample Concentration 11
MS Concentration 27.3
MSD Concentration 28.6
MS TV 17.3
MSD TV 17.1

MS %R 94.22 MATCH
MSD %R 102.92 MATCH
RPD 4.65 MATCH

Lab recoveries are calculated with more significant figures.
%R may not match using rounded values from MS/MSD forms

Tier 3
PFAS Sample Concentration

SDG #: J93629
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/26/2022
 Page: 5
 Validated by: LWM

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-82-DW-080322 Lab ID: 410-93629-3 Page 145
 Instrument: 24743 8/22/2022 20:22 DL 8/22/2022 20:33

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBS	1232072	2006415	28.68	0.614066	1.311	13.43	1	283.7	47.35	47	Match
PFOS 10X	897338	2253907	28.68	0.398126	1.1787	9.69	1	283.7	341.46	340	Match
PFOA	2330322	2166665	10	1.075534	1.0912	9.86	1	283.7	34.74	35	Match

Sample ID: YTC-OFFP-291-DW-080422 Lab ID: 410-93629-12 Page 225
 Instrument: 24743 8/21/2022 23:33

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBS	343893	2478245	28.68	0.138765	1.1325	3.51	1	282.3	12.45	12	Match
PFOS	1467219	2478245	28.68	0.59204	1.1661	14.56	1	282.3	51.58	52	Match
PFOA	755638	3197908	10	0.236291	1.0304	2.29	1	282.3	8.12	8.1	Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: J93629
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/26/2022
Page: 6
Validated by: LWM

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-82-DW-080322 Lab ID: 410-93629-3 Page 145

Surrogate 13C2 PFDA
REPORTED %R 107

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 10.7
Surrogate TV 10.0
%R 107.0 MATCH

Sample ID: YTC-OFFP-291-DW-080422 Lab ID: 410-93629-12 Page 225

Surrogate 13C2 PFHxA
REPORTED %R 97

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 9.67
Surrogate TV 10.0
%R 96.7 MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS





Chain of Custody Record

410-93629 Chain of Custody

Sampler: Andrew Kopchynski		Lab PM: Gordon, Stephen J		Carrier Tracking No(s):		COC No: 410-61650-17570 22	
Phone: (631) 316-4206		E-Mail: Stephen.Gordon@et.eurofins.com		State of Origin: WA		Page: 22 of 28	
Company: Seres Engineering & Services LLC				Analysis Requested			
Address: 669 Marina Drive Suite B7				Job #: 30059933			
City: Charleston				Preservation Codes:			
State, Zip: SC, 29492				A - HCL M - Hexane			
Phone: 720-344-3712(Tel)				B - NaOH N - None			
Email: afkopchynski@seres-es.com				C - Zn Acetate O - AsNaO2			
Project Name: Yakima Training Center (YTC)				D - Nitric Acid P - Na2O4S			
Site: _____				E - NaHSO4 Q - Na2SO3			
Due Date Requested:				F - MeOH R - Na2S2O3			
TAT Requested (days): Normal				G - Amchlor S - H2SO4			
Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No				H - Ascorbic Acid T - TSP Dodecahydrate			
PO #: D18-218 PFAS PA/SI				I - Ice U - Acetone			
WO #: 3005993.YTC00				J - DI Water V - MCAA			
Project #: 41011531				K - EDTA W - pH 4-5			
SSOW#:				L - EDTA Y - Trizma			
				Z - other (specify)			
				Other:			
				Special Instructions/Note:			
Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, D=dregs/tail, BT=tissue, A=air)	Field Filtered Sample (Yes/No)	517.1_DW - DW EPA 517.1 List of 18	Total Number of Containers
YTC-OFFP- 266-DW-080322	08/03/22	1700	G	Drinking Water	N	N	2
YTC-OFFP- 272-DW-080322	08/03/22	1718	G	Drinking Water	N	N	2
YTC-OFFP- 82-DW-080322	08/03/22	1610	G	Drinking Water	N	N	2
YTC-OFFP- 304-DW-080322	08/03/22	1640	G	Drinking Water	N	N	2
YTC-OFFP- FRB-09-DW-080322	08/03/22	1303	G	Drinking Water	N	N	2
YTC-OFFP- FRB-10-DW-080422	08/04/22	1114	G	Drinking Water	N	N	2
YTC-OFFP- 276-DW-080422	08/04/22	1111	G	Drinking Water	N	N	2
YTC-OFFP- 273-DW-080422	08/04/22	1209	G	Drinking Water	N	N	2
YTC-OFFP- 277-DW-080422	08/04/22	1125	S	Drinking Water	N	N	2
YTC-OFFP- 282-DW-080422	08/04/22	1148	G	Drinking Water	N	Y	6
YTC-OFFP- 286-DW-080422	08/04/22	1245	G	Drinking Water	N	N	2
Possible Hazard Identification				Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)			
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological				<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Deliverable Requested: I, II, III, IV, Other (specify)				Special Instructions/QC Requirements:			
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by: Tom Mc...		Date/Time: 08/04/22 1420		Company: Seres		Received by: _____	
Relinquished by: _____		Date/Time: _____		Company: _____		Received by: _____	
Relinquished by: _____		Date/Time: _____		Company: _____		Received by: es	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 0.4			

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Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 410-93629-1

Login Number: 93629

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 1

Creator: McCaskey, Jonathan

Question	Answer	Comment
The cooler's custody seal is intact.	True	
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 ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
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	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace $>6\text{mm}$ in diameter (none, if from WV)?	N/A	

Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93629-1

Qualifiers

LCMS

Qualifier	Qualifier Description
D	The reported value is from a dilution.
E	Result exceeded calibration range.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
M	Manual integrated compound.

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
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
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

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93629-1

Client Sample ID: YTC-OFFP-266-DW-080322

Lab Sample ID: 410-93629-1

Date Collected: 08/03/22 17:00

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	11		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
Perfluoroheptanoic acid	3.9		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
Perfluorooctanoic acid	5.4		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
Perfluorobutanesulfonic acid	8.4		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
Perfluorohexanesulfonic acid	30		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
Perfluorooctanesulfonic acid	6.8		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/19/22 17:51	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 17:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	97		70 - 130	08/16/22 11:16	08/19/22 17:51	1
13C2 PFHxA	101		70 - 130	08/16/22 11:16	08/19/22 17:51	1
13C3 HFPO-DA	99		70 - 130	08/16/22 11:16	08/19/22 17:51	1
d5-NEtFOSAA	94		70 - 130	08/16/22 11:16	08/19/22 17:51	1

Client Sample ID: YTC-OFFP-272-DW-080322

Lab Sample ID: 410-93629-2

Date Collected: 08/03/22 17:18

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:02	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93629-1

Client Sample ID: YTC-OFFP-272-DW-080322

Lab Sample ID: 410-93629-2

Date Collected: 08/03/22 17:18

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130	08/16/22 11:16	08/19/22 18:02	1
13C2 PFHxA	101		70 - 130	08/16/22 11:16	08/19/22 18:02	1
13C3 HFPO-DA	94		70 - 130	08/16/22 11:16	08/19/22 18:02	1
d5-NEtFOSAA	86		70 - 130	08/16/22 11:16	08/19/22 18:02	1

Client Sample ID: YTC-OFFP-82-DW-080322

Lab Sample ID: 410-93629-3

Date Collected: 08/03/22 16:10

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	65		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
Perfluoroheptanoic acid	21		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
Perfluorooctanoic acid	35		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
Perfluorononanoic acid	4.4		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
Perfluorobutanesulfonic acid	47		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/22/22 20:22	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 20:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	107		70 - 130	08/16/22 11:16	08/22/22 20:22	1
13C2 PFHxA	98		70 - 130	08/16/22 11:16	08/22/22 20:22	1
13C3 HFPO-DA	96		70 - 130	08/16/22 11:16	08/22/22 20:22	1
d5-NEtFOSAA	101		70 - 130	08/16/22 11:16	08/22/22 20:22	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	340	D	18	13	4.4	ng/L		08/22/22 20:33	10
Perfluorooctanesulfonic acid	340	D	18	13	4.4	ng/L		08/22/22 20:33	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130	08/16/22 11:16	08/22/22 20:33	10
13C2 PFHxA	96		70 - 130	08/16/22 11:16	08/22/22 20:33	10
13C3 HFPO-DA	93		70 - 130	08/16/22 11:16	08/22/22 20:33	10
d5-NEtFOSAA	104		70 - 130	08/16/22 11:16	08/22/22 20:33	10

Client Sample ID: YTC-OFFP-304-DW-080322

Lab Sample ID: 410-93629-4

Date Collected: 08/03/22 16:40

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	29		1.7	1.3	0.43	ng/L		08/19/22 18:25	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93629-1

Client Sample ID: YTC-OFFP-304-DW-080322

Lab Sample ID: 410-93629-4

Date Collected: 08/03/22 16:40

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	8.5		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
Perfluorooctanoic acid	8.1		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
Perfluorobutanesulfonic acid	17		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/19/22 18:25	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/19/22 18:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	91		70 - 130	08/16/22 11:16	08/19/22 18:25	1
13C2 PFHxA	97		70 - 130	08/16/22 11:16	08/19/22 18:25	1
13C3 HFPO-DA	95		70 - 130	08/16/22 11:16	08/19/22 18:25	1
d5-NEtFOSAA	95		70 - 130	08/16/22 11:16	08/19/22 18:25	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	97	D	17	13	4.3	ng/L		08/22/22 20:45	10
Perfluorooctanesulfonic acid	67	D	17	13	4.3	ng/L		08/22/22 20:45	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130	08/16/22 11:16	08/22/22 20:45	10
13C2 PFHxA	99		70 - 130	08/16/22 11:16	08/22/22 20:45	10
13C3 HFPO-DA	92		70 - 130	08/16/22 11:16	08/22/22 20:45	10
d5-NEtFOSAA	88		70 - 130	08/16/22 11:16	08/22/22 20:45	10

Client Sample ID: YTC-OFFP-FRB-09-DW-080322

Lab Sample ID: 410-93629-5

Date Collected: 08/03/22 13:03

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93629-1

Client Sample ID: YTC-OFFP-FRB-09-DW-080322

Lab Sample ID: 410-93629-5

Date Collected: 08/03/22 13:03

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/19/22 18:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130	08/16/22 11:16	08/19/22 18:48	1
13C2 PFHxA	90		70 - 130	08/16/22 11:16	08/19/22 18:48	1
13C3 HFPO-DA	87		70 - 130	08/16/22 11:16	08/19/22 18:48	1
d5-NEtFOSAA	88		70 - 130	08/16/22 11:16	08/19/22 18:48	1

Client Sample ID: YTC-OFFP-FRB-10-DW-080422

Lab Sample ID: 410-93629-6

Date Collected: 08/04/22 14:14

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 03:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	109		70 - 130	08/17/22 11:16	08/24/22 03:42	1
13C2 PFHxA	98		70 - 130	08/17/22 11:16	08/24/22 03:42	1
13C3 HFPO-DA	92		70 - 130	08/17/22 11:16	08/24/22 03:42	1
d5-NEtFOSAA	99		70 - 130	08/17/22 11:16	08/24/22 03:42	1

Client Sample ID: YTC-OFFP-276-DW-080422

Lab Sample ID: 410-93629-7

Date Collected: 08/04/22 11:11

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	12		1.8	1.4	0.45	ng/L		08/24/22 03:53	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93629-1

Client Sample ID: YTC-OFFP-276-DW-080422

Lab Sample ID: 410-93629-7

Date Collected: 08/04/22 11:11

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	4.0		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
Perfluorooctanoic acid	6.0		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
Perfluorononanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
Perfluorodecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
Perfluorotridecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
Perfluorotetradecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
Perfluorobutanesulfonic acid	4.5		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
Perfluorohexanesulfonic acid	28		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
Perfluorooctanesulfonic acid	23		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
NEtFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
NMeFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
Perfluoroundecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
Perfluorododecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
HFPODA	<1.4		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
9CI-PF3ONS	<1.4		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
11CI-PF3OUdS	<1.4		1.8	1.4	0.45	ng/L		08/24/22 03:53	1
DONA	<1.4		1.8	1.4	0.45	ng/L		08/24/22 03:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	105		70 - 130	08/17/22 11:16	08/24/22 03:53	1
13C2 PFHxA	100		70 - 130	08/17/22 11:16	08/24/22 03:53	1
13C3 HFPO-DA	93		70 - 130	08/17/22 11:16	08/24/22 03:53	1
d5-NEtFOSAA	90		70 - 130	08/17/22 11:16	08/24/22 03:53	1

Client Sample ID: YTC-OFFP-273-DW-080422

Lab Sample ID: 410-93629-8

Date Collected: 08/04/22 12:09

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
Perfluorobutanesulfonic acid	2.2		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
Perfluorohexanesulfonic acid	7.5		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
Perfluorooctanesulfonic acid	2.2 M		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 04:05	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93629-1

Client Sample ID: YTC-OFFP-273-DW-080422

Lab Sample ID: 410-93629-8

Date Collected: 08/04/22 12:09

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103		70 - 130	08/17/22 11:16	08/24/22 04:05	1
13C2 PFHxA	100		70 - 130	08/17/22 11:16	08/24/22 04:05	1
13C3 HFPO-DA	91		70 - 130	08/17/22 11:16	08/24/22 04:05	1
d5-NEtFOSAA	94		70 - 130	08/17/22 11:16	08/24/22 04:05	1

Client Sample ID: YTC-OFFP-277-DW-080422

Lab Sample ID: 410-93629-9

Date Collected: 08/04/22 11:25

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	0.92	J	1.7	1.3	0.44	ng/L		08/21/22 22:35	1
Perfluoroheptanoic acid	0.45	J	1.7	1.3	0.44	ng/L		08/21/22 22:35	1
Perfluorooctanoic acid	1.1	J	1.7	1.3	0.44	ng/L		08/21/22 22:35	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
Perfluorobutanesulfonic acid	4.6		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
Perfluorohexanesulfonic acid	14		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
Perfluorooctanesulfonic acid	3.0		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
NEtFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
NMeFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
HFPODA	<1.3		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
9CI-PF3ONS	<1.3		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.44	ng/L		08/21/22 22:35	1
DONA	<1.3		1.7	1.3	0.44	ng/L		08/21/22 22:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	88		70 - 130	08/17/22 17:20	08/21/22 22:35	1
13C2 PFHxA	92		70 - 130	08/17/22 17:20	08/21/22 22:35	1
13C3 HFPO-DA	94		70 - 130	08/17/22 17:20	08/21/22 22:35	1
d5-NEtFOSAA	86		70 - 130	08/17/22 17:20	08/21/22 22:35	1

Client Sample ID: YTC-OFFP-282-DW-080422

Lab Sample ID: 410-93629-10

Date Collected: 08/04/22 11:48

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	3.7		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
Perfluoroheptanoic acid	1.6	J	1.8	1.3	0.44	ng/L		08/21/22 22:47	1
Perfluorooctanoic acid	3.7	M	1.8	1.3	0.44	ng/L		08/21/22 22:47	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
Perfluorobutanesulfonic acid	9.1		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
Perfluorohexanesulfonic acid	33		1.8	1.3	0.44	ng/L		08/21/22 22:47	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93629-1

Client Sample ID: YTC-OFFP-282-DW-080422

Lab Sample ID: 410-93629-10

Date Collected: 08/04/22 11:48

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	11		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/21/22 22:47	1
Surrogate	%Recovery	Qualifier	Limits		Prepared		Analyzed	Dil Fac	
13C2 PFDA	93		70 - 130		08/17/22 17:20		08/21/22 22:47	1	
13C2 PFHxA	94		70 - 130		08/17/22 17:20		08/21/22 22:47	1	
13C3 HFPO-DA	93		70 - 130		08/17/22 17:20		08/21/22 22:47	1	
d5-NEtFOSAA	87		70 - 130		08/17/22 17:20		08/21/22 22:47	1	

Client Sample ID: YTC-OFFP-286-DW-080422

Lab Sample ID: 410-93629-11

Date Collected: 08/04/22 12:45

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	0.52	J	1.7	1.3	0.44	ng/L		08/23/22 20:47	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
Perfluorooctanoic acid	1.1	J	1.7	1.3	0.44	ng/L		08/23/22 20:47	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
Perfluorohexanesulfonic acid	1.1	J M	1.7	1.3	0.44	ng/L		08/23/22 20:47	1
Perfluorooctanesulfonic acid	2.1		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
NEtFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
NMeFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
HFPODA	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
9CI-PF3ONS	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
DONA	<1.3		1.7	1.3	0.44	ng/L		08/23/22 20:47	1
Surrogate	%Recovery	Qualifier	Limits		Prepared		Analyzed	Dil Fac	
13C2 PFDA	99		70 - 130		08/17/22 17:20		08/23/22 20:47	1	
13C2 PFHxA	95		70 - 130		08/17/22 17:20		08/23/22 20:47	1	
13C3 HFPO-DA	88		70 - 130		08/17/22 17:20		08/23/22 20:47	1	
d5-NEtFOSAA	90		70 - 130		08/17/22 17:20		08/23/22 20:47	1	

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93629-1

Client Sample ID: YTC-OFFP-291-DW-080422

Lab Sample ID: 410-93629-12

Date Collected: 08/04/22 13:02

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	12		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
Perfluoroheptanoic acid	4.5		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
Perfluorooctanoic acid	8.1		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
Perfluorononanoic acid	0.83	J	1.8	1.3	0.44	ng/L		08/21/22 23:33	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
Perfluorobutanesulfonic acid	12		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
Perfluorohexanesulfonic acid	61		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
Perfluorooctanesulfonic acid	52		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/21/22 23:33	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/21/22 23:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	88		70 - 130	08/17/22 17:20	08/21/22 23:33	1
13C2 PFHxA	97		70 - 130	08/17/22 17:20	08/21/22 23:33	1
13C3 HFPO-DA	91		70 - 130	08/17/22 17:20	08/21/22 23:33	1
d5-NEtFOSAA	90		70 - 130	08/17/22 17:20	08/21/22 23:33	1

Client Sample ID: YTC-OFFP-FD-09-080422

Lab Sample ID: 410-93629-13

Date Collected: 08/04/22 12:00

Matrix: Drinking Water

Date Received: 08/05/22 10:28

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	3.7		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
Perfluoroheptanoic acid	1.7		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
Perfluorooctanoic acid	3.8		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
Perfluorobutanesulfonic acid	9.7	M	1.7	1.3	0.43	ng/L		08/23/22 20:58	1
Perfluorohexanesulfonic acid	34		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
Perfluorooctanesulfonic acid	11		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:58	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 20:58	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93629-1

Client Sample ID: YTC-OFFP-FD-09-080422

Lab Sample ID: 410-93629-13

Date Collected: 08/04/22 12:00

Matrix: Drinking Water

Date Received: 08/05/22 10:28

<u>Surrogate</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
13C2 PFDA	98		70 - 130	08/17/22 17:20	08/23/22 20:58	1
13C2 PFHxA	94		70 - 130	08/17/22 17:20	08/23/22 20:58	1
13C3 HFPO-DA	89		70 - 130	08/17/22 17:20	08/23/22 20:58	1
d5-NEtFOSAA	82		70 - 130	08/17/22 17:20	08/23/22 20:58	1

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #410-93634-1

Analyses Performed By:

Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report #46636R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93634-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-321-DW-080222	410-93634-1	Water	8/2/2022		X
YTC-OFFP-236-DW-080222	410-93634-2	Water	8/2/2022		X
YTC-OFFP-241-DW-080222	410-93634-3	Water	8/2/2022		X
YTC-OFFP-242-DW-080222	410-93634-4	Water	8/2/2022		X
YTC-OFFP-244-DW-080222	410-93634-5	Water	8/2/2022		X
YTC-OFFP-131-DW-080222	410-93634-6	Water	8/2/2022		X
YTC-OFFP-246-DW-080222	410-93634-7	Water	8/2/2022		X
YTC-OFFP-247-DW-080222	410-93634-8	Water	8/2/2022		X
YTC-OFFP-249-DW-080222	410-93634-9	Water	8/2/2022		X
YTC-OFFP-FD-07-DW-080222	410-93634-10	Water	8/2/2022	YTC-OFFP-242-DW-080222	X
YTC-OFFP-FRB-08-DW-080222	410-93634-11	Water	8/2/2022		X
YTC-OFFP-255-DW-080322	410-93634-12	Water	8/3/2022		X
YTC-OFFP-259-DW-080322	410-93634-13	Water	8/3/2022		X
YTC-OFFP-260-DW-080322	410-93634-14	Water	8/3/2022		X
YTC-OFFP-261-DW-080322	410-93634-15	Water	8/3/2022		X
YTC-OFFP-263-DW-080322	410-93634-16	Water	8/3/2022		X
YTC-OFFP-265-DW-080322	410-93634-17	Water	8/3/2022		X
YTC-OFFP-269-DW-080322	410-93634-18	Water	8/3/2022		X
YTC-OFFP-FD-08-DW-080322	410-93634-19	Water	8/3/2022	YTC-OFFP-263-DW-080322	X

Note:

DATA REVIEW REPORT

1. Stage 3/4 validation was performed on sample locations YTC-OFFP-242-DW-080222 and YTC-OFFP-265-DW-080322.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample locations YTC-OFFP-242-DW-080222 and YTC-OFFP-263-DW-080322.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Yakima, Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance was acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard. The initial calibration verification (ICV) standard recoveries must be within 70-130% of their true value.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

DATA REVIEW REPORT

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in EPA method 537 version 2.0 Table 4.

The ion transitions were as specified in EPA method 537 version 2.0 Table 4.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis performed on sample locations YTC-OFFP-242-DW-080222 and YTC-OFFP-263-DW-080322 exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

7. Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

DATA REVIEW REPORT

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
YTC-OFFP-242-DW-080222/ YTC-OFFP-FD-07-DW-080222	Perfluorohexanoic acid	38	37	2.7%
	Perfluoroheptanoic acid	12	12	0.0%
	Perfluorooctanoic acid	13	12	8.0%
	Perfluorononanoic acid	0.52 J	0.52 J	AC
	Perfluorobutanesulfonic acid	17	16	6.1%
	Perfluorohexanesulfonic acid	89	92	3.3%
	Perfluorooctanesulfonic acid	92	89	3.3%
YTC-OFFP-263-DW-080322/ YTC-OFFP-FD-08-DW-080322	Perfluorohexanoic acid	1.9	2.0	AC
	Perfluoroheptanoic acid	0.74 J	0.76 J	
	Perfluorooctanoic acid	1.0 J	1.1 J	
	Perfluorobutanesulfonic acid	0.76 J	0.80 J	
	Perfluorohexanesulfonic acid	2.4	2.4	
	Perfluorooctanesulfonic acid	2.1	2.1	

Notes:

AC Acceptable

The calculated RPD and results between the parent samples and their associated field duplicate were acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-242-DW-080222	Perfluorohexanesulfonic acid	--	89	89 D
	Perfluorooctanesulfonic acid	--	92	92 D
YTC-OFFP-FD-07-DW-080222	Perfluorohexanesulfonic acid	--	92	92 D
	Perfluorooctanesulfonic acid	--	89	89 D

Note: The laboratory did not report the original analysis, only the diluted result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

DATA REVIEW REPORT

Reported Sample Results	Qualification
Diluted sample result within calibration range.	D

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field reagent blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate Standard %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Stage 3/4 Validation					
System performance check		X		X	
Initial calibration %RSD/%R		X		X	
Continuing calibration %R/%D		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculations acceptable		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

- %RSD Relative standard deviation
- %R Percent recovery
- RPD Relative percent difference
- %D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Lyndi Mott, Arcadis

SIGNATURE:

A handwritten signature in black ink, appearing to read "Lyndi Mott", is written over a light pink rectangular background. Below the signature is a solid black horizontal line.

DATE: August 29, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: August 30, 2022

Tier 3
PFAS Calibration Standards %D

SDG #: J93634
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/29/2022
 Page: 1
 Validated by: LWM

Method: EPA Method 537.1, Version 2.0

PFBS 08/22/2022 Calibration Instrument 24743 Page 367

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.443	38933	2062931	28.68	0.018873	1.221824	1.311	0.412866	0.443	-6.802	-6.7	MATCH
0.885	80694	2038494	28.68	0.039585	1.282826	1.311	0.865981	0.885	-2.149	-2.2	MATCH
2.21	227812	2092767	28.68	0.108857	1.412676	1.311	2.381399	2.21	7.756	7.6	MATCH
4.43	426051	2108407	28.68	0.202072	1.308225	1.311	4.420624	4.43	-0.212	-0.1	MATCH
17.7	1661846	2067450	28.68	0.803814	1.302452	1.311	17.58459	17.7	-0.652	-0.7	MATCH
Avg RF					1.305601	No Match					

PFOS 08/21/2022 Calibration Instrument 30730 Page 432

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	125753	6620001	28.68	0.018996	1.17668	1.2217	0.445938	0.463	-3.685	-3.6	MATCH
0.926	242837	6495796	28.68	0.037384	1.157846	1.2217	0.877601	0.926	-5.227	-5.2	MATCH
2.31	699823	6669652	28.68	0.104926	1.302723	1.2217	2.4632	2.31	6.632	6.5	MATCH
4.63	1347449	6681587	28.68	0.201666	1.249197	1.2217	4.734207	4.63	2.251	2.3	MATCH
18.5	5057870	6482024	28.68	0.780292	1.209663	1.2217	18.31773	18.5	-0.985	-1.0	MATCH
Avg RF					1.219222	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope
 Concentration ng/ml = (Peak area ratio/slope) x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: J93634
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/29/2022
 Page: 2
 Validated by: LWM

Method: EPA Method 537.1, Version 2.0

ICV 410-288402/8 8/22/2022 13:49 Instrument 24743 Page 626

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	208551	2104409	28.68	0.099102	1.311	2.1680	2.21	-1.90	-2.0	Match
PFOS	188987	2104409	28.68	0.089805	1.1787	2.1851	2.39	-8.57	-8.6	Match
PFHxA	579373	2138516	10	0.270923	1.0835	2.5004	2.5	0.02	0.0	Match

CCVIS 410-289227/48, 08/24/2022, 22:21 Instrument 24743 Page 645

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFBS	1631048	2179001	28.68	0.74853	1.311	16.375	17.7	-7.48	-7.5	Match
PFOS	1641841	2179001	28.68	0.753483	1.1787	18.334	18.5	-0.90	-0.9	Match
PFHxA	4848939	2285779	10	2.121351	1.0835	19.579	20	-2.11	-2.1	Match

ICV 410-288773/8 8/23/2022 16:25 Instrument 30730 Page 718

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFOA	1572814	5227752	10	0.300859	1.1471	2.6228	2.5	4.91	4.9	Match
PFOS	669991	6959168	28.68	0.096275	1.2324	2.2405	2.39	-6.26	-6.3	Match
PFHxS	789271	6959168	28.68	0.113415	1.4328	2.2702	2.36	-3.81	-4.0	Match

CCVIS 410-288829/19, 08/23/2022, 22:02 Instrument 30730 Page 730

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFOA	11359132	5553100	10	2.045548	1.1471	17.832	20	-10.84	-10.8	Match
PFOS	5340309	6814590	28.68	0.783658	1.2324	18.237	18.5	-1.42	-1.5	Match
PFHxS	6020149	6814590	28.68	0.883421	1.4328	17.683	18.2	-2.84	-3.1	Match

Concentration ng/ml = (Peak area ratio/slope) x IS concentration

Tier 3
PFAS LCS

SDG #: J93634
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/29/2022
Page: 3
Validated by: LWM

Method: EPA Method 537.1, Version 2.0

LCS ID 410-286472/2-A

Page 122 - 123

ANALYTE PFOS

REPORTED LCS %R 95
REPORTED LCSD %R 99
REPORTED RPD 4

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration 70.1
LCSD Concentration 73
LCS TV 74
LCSD TV 74

LCS %R 94.73 MATCH
LCSD %R 98.65 MATCH
RPD 4.05

Tier 3
PFAS MS/MSD

SDG #: J93634
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/29/2022
Page: 4
Validated by: LWM

Method: EPA Method 537.1, Version 2.0

MS/MSD Sample ID YTC-OFFP-242-DW-080222

Page 124 and 126

ANALYTE PFOA
REPORTED MS %R 98
REPORTED MSD %R 99
REPORTED RPD 1

$$\%R = \frac{100 * \text{MS Concentration}}{\text{MS TV}}$$

$$\text{RPD} = \frac{100 * | \text{MS \%R} - \text{MSD \%R} |}{\text{Average of MS MSD \%R}}$$

Sample Concentration 13
MS Concentration 30.1
MSD Concentration 30.5
MS TV 17.9
MSD TV 18.0

MS %R 95.53 MATCH
MSD %R 97.22 MATCH
RPD 1.32 MATCH

Differences in %R may be due to rounded values from the MS/MSD Form III used to calculate the recoveries

Tier 3
PFAS Sample Concentration

SDG #: J93634
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/29/2022
 Page: 5
 Validated by: LWM

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-242-DW-080222 Lab ID: 410-93634-4 Page 168
 Instrument: 24743 8/24/2022 22:32 DL 8/26/2022 13:00

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFBS	521495	2280375	28.68	0.228688	1.311	5.00	1	299.9	16.68	17
PFOS 10x	280767	2485117	28.68	0.112979	1.1787	2.75	1	299.9	91.66	92
PFHxA	2960491	2399144	10	1.233978	1.0835	11.39	1	299.9	37.98	38

Match
Match
Match

Sample ID: YTC-OFFP-265-DW-080322 Lab ID: 410-93634-17 Page 276
 Instrument: 30730 8/23/2022 23:23

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L
PFOA	577078	6425217	10	0.089815	1.1471	0.78	1	295.1	2.65	2.7
PFOS	792301	7516635	28.68	0.105406	1.2324	2.45	1	295.1	8.31	8.3
PFHxS	1521351	7516635	28.68	0.202398	1.4328	4.05	1	295.1	13.73	14

Match
Match
Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: J93634
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/29/2022
Page: 6
Validated by: LWM

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-242-DW-080222 Lab ID: 410-93634-4 Page 168

Surrogate 13C2 PFDA
REPORTED %R 108

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 10.8
Surrogate TV 10.0
%R 108.0 MATCH

Sample ID: YTC-OFFP-265-DW-080322 Lab ID: 410-93634-17 Page 276

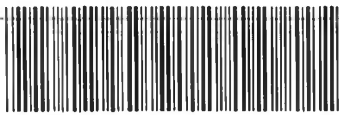
Surrogate 13C3 HFPO-DA
REPORTED %R 91

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 9.08
Surrogate TV 10.0
%R 90.8 MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS





Chain of Custody Record

410-93634 Chain of Custody

Sampler: Andrew Kopchynski		Lab PM: Gordon, Stephen J		Carrier Tracking No(s):		COC No: 410-61650-17570 22						
Phone: (631) 316-4206		E-Mail: Stephen.Gordon@et.eurofinsus.com		State of Origin: WA		Page: 1 2 Page 22 of 28						
Company: Seres Engineering & Services LLC		PWSID:		Analysis Requested				Job #: 30059933				
Address: 669 Marina Drive Suite B7		Due Date Requested:										
City: Charleston		TAT Requested (days): Normal		<table border="1"> <tr><td>Field Filtered Sample</td></tr> <tr><td>537.1 DW - DW EPA 537.1 List of 18</td></tr> <tr><td>Total Number of Co</td></tr> </table>				Field Filtered Sample	537.1 DW - DW EPA 537.1 List of 18	Total Number of Co	Preservation Codes:	
Field Filtered Sample												
537.1 DW - DW EPA 537.1 List of 18												
Total Number of Co												
State, Zip: SC, 29492		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No						A - HCL		M - Hexane		
Phone: 720-344-3712(Tel)		PO #: D18-218 PFAS PA/SI						B - NaOH		N - None		
Email: afkopchynski@seres-es.com		WO #: 3005993.YTC00						C - Zn Acetate		O - AsNaO2		
Project Name: Yakima Training Center (YTC)		Project #: 41011531						D - Nitric Acid		P - Na2O4S		
Site: ---		SSOW#:						E - NaHSO4		Q - Na2SO3		
								F - MeOH		R - Na2S2O3		
				G - Amchlor		S - H2SO4						
				H - Ascortric Acid		T - TSP Dodecahydrate						
				I - Ice		U - Acetone						
				J - DI Water		V - MCAA						
				K - EDTA		W - pH 4-5						
				L - EDA		Y - Trizma						
						Z - other (specify)						
						Other:						
						Special Instructions/Note:						

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=tissue, A=air)	Field Filtered Sample	537.1 DW - DW EPA 537.1 List of 18	Total Number of Co	Special Instructions/Note:
YTC-OFFP-321-DW-080222	08/02/22	1427	G	Drinking Water	N	N	2	
YTC-OFFP-236-DW-080222	08/02/22	1042	G	Drinking Water	N	N	2	
YTC-OFFP-241-DW-080222	08/02/22	1027	G	Drinking Water	N	N	2	
YTC-OFFP-242-DW-080222	08/02/22	0955	G	Drinking Water	N	Y	6	
YTC-OFFP-244-DW-080222	08/02/22	0919	G	Drinking Water	N	N	2	
YTC-OFFP-131-DW-080222	08/02/22	1330	G	Drinking Water	N	N	2	
YTC-OFFP-246-DW-080222	08/02/22	1124	G	Drinking Water	N	N	2	
YTC-OFFP-247-DW-080222	08/02/22	1103	G	Drinking Water	N	N	2	
YTC-OFFP-249-DW-080222	08/02/22	1305	G	Drinking Water	N	N	2	
YTC-OFFP-AD-07-DW-080222	08/02/22	1200	G	Drinking Water	N	N	2	
YTC-OFFP-FRB-08-DW-080222	08/02/22	1542	G	Drinking Water	N	N	2	

Possible Hazard Identification: Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return To Client Disposal By Lab Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: _____ Date: _____ Time: _____ Method of Shipment: _____

Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by: JN	Date/Time: 8/5/22 10:23	Company: EWET

Custody Seals Intact: Yes No Custody Seal No.: _____ Cooler Temperature(s) °C and Other Remarks: **1.2**



.1M

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 410-93634-1

Login Number: 93634

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 1

Creator: McCaskey, Jonathan

Question	Answer	Comment
The cooler's custody seal is intact.	True	
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 ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	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	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	Not present.
VOA sample vials do not have headspace $> 6\text{mm}$ in diameter (none, if from WV)?	N/A	

Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93634-1

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.
D	The reported value is from a dilution.
E	Result exceeded calibration range.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
M	Manual integrated compound.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
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

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93634-1

Client Sample ID: YTC-OFFP-321-DW-080222

Lab Sample ID: 410-93634-1

Date Collected: 08/02/22 14:27

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	14		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
Perfluoroheptanoic acid	2.7		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
Perfluorooctanoic acid	3.8		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
Perfluorobutanesulfonic acid	11		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
Perfluorohexanesulfonic acid	62		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
Perfluorooctanesulfonic acid	44		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/24/22 21:46	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 21:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	109		70 - 130	08/15/22 16:26	08/24/22 21:46	1
13C2 PFHxA	100		70 - 130	08/15/22 16:26	08/24/22 21:46	1
13C3 HFPO-DA	97		70 - 130	08/15/22 16:26	08/24/22 21:46	1
d5-NEtFOSAA	90		70 - 130	08/15/22 16:26	08/24/22 21:46	1

Client Sample ID: YTC-OFFP-236-DW-080222

Lab Sample ID: 410-93634-2

Date Collected: 08/02/22 10:42

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
Perfluoroheptanoic acid	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
Perfluorooctanoic acid	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
Perfluorononanoic acid	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
Perfluorodecanoic acid	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
Perfluorotridecanoic acid	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
Perfluorotetradecanoic acid	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
Perfluorobutanesulfonic acid	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
Perfluorohexanesulfonic acid	0.95	J	1.9	1.4	0.48	ng/L		08/24/22 21:58	1
Perfluorooctanesulfonic acid	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
NEtFOSAA	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
NMeFOSAA	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
Perfluoroundecanoic acid	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
Perfluorododecanoic acid	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
HFPODA	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
9CI-PF3ONS	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
11CI-PF3OUdS	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1
DONA	<1.4		1.9	1.4	0.48	ng/L		08/24/22 21:58	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93634-1

Client Sample ID: YTC-OFFP-236-DW-080222

Lab Sample ID: 410-93634-2

Date Collected: 08/02/22 10:42

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130	08/15/22 16:26	08/24/22 21:58	1
13C2 PFHxA	92		70 - 130	08/15/22 16:26	08/24/22 21:58	1
13C3 HFPO-DA	92		70 - 130	08/15/22 16:26	08/24/22 21:58	1
d5-NEtFOSAA	92		70 - 130	08/15/22 16:26	08/24/22 21:58	1

Client Sample ID: YTC-OFFP-241-DW-080222

Lab Sample ID: 410-93634-3

Date Collected: 08/02/22 10:27

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
NEtFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
NMeFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
HFPODA	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
9Cl-PF3ONS	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
11Cl-PF3OUdS	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1
DONA	<1.3		1.8	1.3	0.45	ng/L		08/24/22 22:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	98		70 - 130	08/15/22 16:26	08/24/22 22:09	1
13C2 PFHxA	95		70 - 130	08/15/22 16:26	08/24/22 22:09	1
13C3 HFPO-DA	90		70 - 130	08/15/22 16:26	08/24/22 22:09	1
d5-NEtFOSAA	87		70 - 130	08/15/22 16:26	08/24/22 22:09	1

Client Sample ID: YTC-OFFP-242-DW-080222

Lab Sample ID: 410-93634-4

Date Collected: 08/02/22 09:55

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	38		1.7	1.3	0.42	ng/L		08/24/22 22:32	1
Perfluoroheptanoic acid	12		1.7	1.3	0.42	ng/L		08/24/22 22:32	1
Perfluorooctanoic acid	13		1.7	1.3	0.42	ng/L		08/24/22 22:32	1
Perfluorononanoic acid	0.52	J	1.7	1.3	0.42	ng/L		08/24/22 22:32	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 22:32	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 22:32	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 22:32	1
Perfluorobutanesulfonic acid	17		1.7	1.3	0.42	ng/L		08/24/22 22:32	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 22:32	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93634-1

Client Sample ID: YTC-OFFP-242-DW-080222

Lab Sample ID: 410-93634-4

Date Collected: 08/02/22 09:55

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 22:32	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 22:32	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/24/22 22:32	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 22:32	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/24/22 22:32	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/24/22 22:32	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/24/22 22:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	108		70 - 130	08/15/22 16:26	08/24/22 22:32	1
13C2 PFHxA	101		70 - 130	08/15/22 16:26	08/24/22 22:32	1
13C3 HFPO-DA	95		70 - 130	08/15/22 16:26	08/24/22 22:32	1
d5-NEtFOSAA	90		70 - 130	08/15/22 16:26	08/24/22 22:32	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	89	D	17	13	4.2	ng/L		08/26/22 13:00	10
Perfluorooctanesulfonic acid	92	D	17	13	4.2	ng/L		08/26/22 13:00	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103		70 - 130	08/15/22 16:26	08/26/22 13:00	10
13C2 PFHxA	94		70 - 130	08/15/22 16:26	08/26/22 13:00	10
13C3 HFPO-DA	96		70 - 130	08/15/22 16:26	08/26/22 13:00	10
d5-NEtFOSAA	91		70 - 130	08/15/22 16:26	08/26/22 13:00	10

Client Sample ID: YTC-OFFP-244-DW-080222

Lab Sample ID: 410-93634-5

Date Collected: 08/02/22 09:19

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
Perfluoroheptanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
Perfluorooctanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
Perfluorononanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
Perfluorodecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
Perfluorotridecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
Perfluorotetradecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
Perfluorobutanesulfonic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
Perfluorohexanesulfonic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
Perfluorooctanesulfonic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
NEtFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
NMeFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
Perfluoroundecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
Perfluorododecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
HFPODA	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
9CI-PF3ONS	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
11CI-PF3OUdS	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1
DONA	<1.4		1.8	1.4	0.45	ng/L		08/24/22 23:07	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93634-1

Client Sample ID: YTC-OFFP-244-DW-080222

Lab Sample ID: 410-93634-5

Date Collected: 08/02/22 09:19

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130	08/15/22 16:26	08/24/22 23:07	1
13C2 PFHxA	93		70 - 130	08/15/22 16:26	08/24/22 23:07	1
13C3 HFPO-DA	88		70 - 130	08/15/22 16:26	08/24/22 23:07	1
d5-NEtFOSAA	90		70 - 130	08/15/22 16:26	08/24/22 23:07	1

Client Sample ID: YTC-OFFP-131-DW-080222

Lab Sample ID: 410-93634-6

Date Collected: 08/02/22 13:30

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
9Cl-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
11Cl-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	101		70 - 130	08/15/22 16:26	08/24/22 23:18	1
13C2 PFHxA	95		70 - 130	08/15/22 16:26	08/24/22 23:18	1
13C3 HFPO-DA	91		70 - 130	08/15/22 16:26	08/24/22 23:18	1
d5-NEtFOSAA	89		70 - 130	08/15/22 16:26	08/24/22 23:18	1

Client Sample ID: YTC-OFFP-246-DW-080222

Lab Sample ID: 410-93634-7

Date Collected: 08/02/22 11:24

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
Perfluoroheptanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
Perfluorooctanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
Perfluorobutanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
Perfluorohexanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93634-1

Client Sample ID: YTC-OFFP-246-DW-080222

Lab Sample ID: 410-93634-7

Date Collected: 08/02/22 11:24

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/24/22 23:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	99		70 - 130				08/15/22 16:26	08/24/22 23:30	1
13C2 PFHxA	90		70 - 130				08/15/22 16:26	08/24/22 23:30	1
13C3 HFPO-DA	85		70 - 130				08/15/22 16:26	08/24/22 23:30	1
d5-NEtFOSAA	89		70 - 130				08/15/22 16:26	08/24/22 23:30	1

Client Sample ID: YTC-OFFP-247-DW-080222

Lab Sample ID: 410-93634-8

Date Collected: 08/02/22 11:03

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
Perfluoroheptanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
Perfluorooctanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
Perfluorononanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
Perfluorodecanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
Perfluorotridecanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
Perfluorotetradecanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
Perfluorobutanesulfonic acid	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
Perfluorohexanesulfonic acid	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
Perfluorooctanesulfonic acid	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
NEtFOSAA	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
NMeFOSAA	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
Perfluoroundecanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
Perfluorododecanoic acid	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
HFPODA	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
9Cl-PF3ONS	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
11Cl-PF3OUdS	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
DONA	<1.2		1.7	1.2	0.41	ng/L		08/24/22 23:41	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	104		70 - 130				08/15/22 16:26	08/24/22 23:41	1
13C2 PFHxA	100		70 - 130				08/15/22 16:26	08/24/22 23:41	1
13C3 HFPO-DA	94		70 - 130				08/15/22 16:26	08/24/22 23:41	1
d5-NEtFOSAA	102		70 - 130				08/15/22 16:26	08/24/22 23:41	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93634-1

Client Sample ID: YTC-OFFP-249-DW-080222

Lab Sample ID: 410-93634-9

Date Collected: 08/02/22 13:05

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
9Cl-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
11Cl-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/24/22 23:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	106		70 - 130	08/15/22 16:26	08/24/22 23:53	1
13C2 PFHxA	97		70 - 130	08/15/22 16:26	08/24/22 23:53	1
13C3 HFPO-DA	93		70 - 130	08/15/22 16:26	08/24/22 23:53	1
d5-NEtFOSAA	98		70 - 130	08/15/22 16:26	08/24/22 23:53	1

Client Sample ID: YTC-OFFP-FD-07-DW-080222

Lab Sample ID: 410-93634-10

Date Collected: 08/02/22 12:00

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	37		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
Perfluoroheptanoic acid	12		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
Perfluorooctanoic acid	12		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
Perfluorononanoic acid	0.52	J	1.7	1.3	0.43	ng/L		08/25/22 00:04	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
Perfluorobutanesulfonic acid	16		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/25/22 00:04	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/25/22 00:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	105		70 - 130	08/15/22 16:26	08/25/22 00:04	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93634-1

Client Sample ID: YTC-OFFP-FD-07-DW-080222

Lab Sample ID: 410-93634-10

Date Collected: 08/02/22 12:00

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	98		70 - 130	08/15/22 16:26	08/25/22 00:04	1
13C3 HFPO-DA	93		70 - 130	08/15/22 16:26	08/25/22 00:04	1
d5-NEtFOSAA	94		70 - 130	08/15/22 16:26	08/25/22 00:04	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	92	D	17	13	4.3	ng/L		08/26/22 13:11	10
Perfluorooctanesulfonic acid	89	D	17	13	4.3	ng/L		08/26/22 13:11	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	99		70 - 130	08/15/22 16:26	08/26/22 13:11	10
13C2 PFHxA	92		70 - 130	08/15/22 16:26	08/26/22 13:11	10
13C3 HFPO-DA	94		70 - 130	08/15/22 16:26	08/26/22 13:11	10
d5-NEtFOSAA	89		70 - 130	08/15/22 16:26	08/26/22 13:11	10

Client Sample ID: YTC-OFFP-FRB-08-DW-080222

Lab Sample ID: 410-93634-11

Date Collected: 08/02/22 15:42

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
NEtFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
NMeFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
HFPODA	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
9CI-PF3ONS	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1
DONA	<1.3		1.8	1.3	0.45	ng/L		08/25/22 00:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	97		70 - 130	08/15/22 16:26	08/25/22 00:16	1
13C2 PFHxA	87		70 - 130	08/15/22 16:26	08/25/22 00:16	1
13C3 HFPO-DA	85		70 - 130	08/15/22 16:26	08/25/22 00:16	1
d5-NEtFOSAA	85		70 - 130	08/15/22 16:26	08/25/22 00:16	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93634-1

Client Sample ID: YTC-OFFP-255-DW-080322

Lab Sample ID: 410-93634-12

Date Collected: 08/03/22 09:09

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
Perfluorooctanoic acid	0.49	J	1.8	1.3	0.45	ng/L		08/19/22 19:00	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
Perfluorobutanesulfonic acid	0.88	J	1.8	1.3	0.45	ng/L		08/19/22 19:00	1
Perfluorohexanesulfonic acid	3.8		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
Perfluorooctanesulfonic acid	0.54	J	1.8	1.3	0.45	ng/L		08/19/22 19:00	1
NEtFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
NMeFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
HFPODA	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
9CI-PF3ONS	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1
DONA	<1.3		1.8	1.3	0.45	ng/L		08/19/22 19:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	100		70 - 130	08/16/22 11:16	08/19/22 19:00	1
13C2 PFHxA	100		70 - 130	08/16/22 11:16	08/19/22 19:00	1
13C3 HFPO-DA	96		70 - 130	08/16/22 11:16	08/19/22 19:00	1
d5-NEtFOSAA	92		70 - 130	08/16/22 11:16	08/19/22 19:00	1

Client Sample ID: YTC-OFFP-259-DW-080322

Lab Sample ID: 410-93634-13

Date Collected: 08/03/22 10:15

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
Perfluoroheptanoic acid	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
Perfluorooctanoic acid	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
Perfluorononanoic acid	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
Perfluorodecanoic acid	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
Perfluorotridecanoic acid	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
Perfluorotetradecanoic acid	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
Perfluorobutanesulfonic acid	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
Perfluorohexanesulfonic acid	0.49	J	1.9	1.4	0.46	ng/L		08/19/22 19:11	1
Perfluorooctanesulfonic acid	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
NEtFOSAA	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
NMeFOSAA	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
Perfluoroundecanoic acid	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
Perfluorododecanoic acid	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
HFPODA	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
9CI-PF3ONS	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
11CI-PF3OUdS	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1
DONA	<1.4		1.9	1.4	0.46	ng/L		08/19/22 19:11	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93634-1

Client Sample ID: YTC-OFFP-259-DW-080322

Lab Sample ID: 410-93634-13

Date Collected: 08/03/22 10:15

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	97		70 - 130	08/16/22 11:16	08/19/22 19:11	1
13C2 PFHxA	98		70 - 130	08/16/22 11:16	08/19/22 19:11	1
13C3 HFPO-DA	96		70 - 130	08/16/22 11:16	08/19/22 19:11	1
d5-NEtFOSAA	90		70 - 130	08/16/22 11:16	08/19/22 19:11	1

Client Sample ID: YTC-OFFP-260-DW-080322

Lab Sample ID: 410-93634-14

Date Collected: 08/03/22 10:25

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.1	J	1.8	1.3	0.44	ng/L		08/23/22 22:25	1
Perfluoroheptanoic acid	0.57	J	1.8	1.3	0.44	ng/L		08/23/22 22:25	1
Perfluorooctanoic acid	0.85	J M	1.8	1.3	0.44	ng/L		08/23/22 22:25	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:25	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:25	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:25	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:25	1
Perfluorobutanesulfonic acid	0.54	J	1.8	1.3	0.44	ng/L		08/23/22 22:25	1
Perfluorohexanesulfonic acid	2.6		1.8	1.3	0.44	ng/L		08/23/22 22:25	1
Perfluorooctanesulfonic acid	0.88	J	1.8	1.3	0.44	ng/L		08/23/22 22:25	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:25	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:25	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:25	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:25	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:25	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:25	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:25	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	96		70 - 130	08/16/22 10:41	08/23/22 22:25	1
13C2 PFHxA	86		70 - 130	08/16/22 10:41	08/23/22 22:25	1
13C3 HFPO-DA	83		70 - 130	08/16/22 10:41	08/23/22 22:25	1
d5-NEtFOSAA	96		70 - 130	08/16/22 10:41	08/23/22 22:25	1

Client Sample ID: YTC-OFFP-261-DW-080322

Lab Sample ID: 410-93634-15

Date Collected: 08/03/22 10:43

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	2.6		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
Perfluoroheptanoic acid	1.0	J	1.7	1.3	0.42	ng/L		08/23/22 22:37	1
Perfluorooctanoic acid	2.3	M	1.7	1.3	0.42	ng/L		08/23/22 22:37	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
Perfluorobutanesulfonic acid	1.9		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
Perfluorohexanesulfonic acid	9.6		1.7	1.3	0.42	ng/L		08/23/22 22:37	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93634-1

Client Sample ID: YTC-OFFP-261-DW-080322

Lab Sample ID: 410-93634-15

Date Collected: 08/03/22 10:43

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	3.4		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/23/22 22:37	1
Surrogate	%Recovery	Qualifier	Limits		Prepared		Analyzed	Dil Fac	
13C2 PFDA	94		70 - 130		08/16/22 10:41		08/23/22 22:37	1	
13C2 PFHxA	89		70 - 130		08/16/22 10:41		08/23/22 22:37	1	
13C3 HFPO-DA	86		70 - 130		08/16/22 10:41		08/23/22 22:37	1	
d5-NEtFOSAA	90		70 - 130		08/16/22 10:41		08/23/22 22:37	1	

Client Sample ID: YTC-OFFP-263-DW-080322

Lab Sample ID: 410-93634-16

Date Collected: 08/03/22 09:35

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	1.9		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
Perfluoroheptanoic acid	0.74	J	1.8	1.4	0.45	ng/L		08/23/22 22:49	1
Perfluorooctanoic acid	1.0	J M	1.8	1.4	0.45	ng/L		08/23/22 22:49	1
Perfluorononanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
Perfluorodecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
Perfluorotridecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
Perfluorotetradecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
Perfluorobutanesulfonic acid	0.76	J	1.8	1.4	0.45	ng/L		08/23/22 22:49	1
Perfluorohexanesulfonic acid	2.4		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
Perfluorooctanesulfonic acid	2.1		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
NEtFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
NMeFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
Perfluoroundecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
Perfluorododecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
HFPODA	<1.4		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
9CI-PF3ONS	<1.4		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
11CI-PF3OUdS	<1.4		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
DONA	<1.4		1.8	1.4	0.45	ng/L		08/23/22 22:49	1
Surrogate	%Recovery	Qualifier	Limits		Prepared		Analyzed	Dil Fac	
13C2 PFDA	92		70 - 130		08/16/22 10:41		08/23/22 22:49	1	
13C2 PFHxA	83		70 - 130		08/16/22 10:41		08/23/22 22:49	1	
13C3 HFPO-DA	78		70 - 130		08/16/22 10:41		08/23/22 22:49	1	
d5-NEtFOSAA	96		70 - 130		08/16/22 10:41		08/23/22 22:49	1	

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93634-1

Client Sample ID: YTC-OFFP-265-DW-080322

Lab Sample ID: 410-93634-17

Date Collected: 08/03/22 09:57

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	4.8		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
Perfluoroheptanoic acid	1.7		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
Perfluorooctanoic acid	2.7	M	1.7	1.3	0.42	ng/L		08/23/22 23:23	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
Perfluorobutanesulfonic acid	2.6		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
Perfluorohexanesulfonic acid	14		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
Perfluorooctanesulfonic acid	8.3		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/23/22 23:23	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/23/22 23:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130	08/16/22 10:41	08/23/22 23:23	1
13C2 PFHxA	91		70 - 130	08/16/22 10:41	08/23/22 23:23	1
13C3 HFPO-DA	91		70 - 130	08/16/22 10:41	08/23/22 23:23	1
d5-NEtFOSAA	93		70 - 130	08/16/22 10:41	08/23/22 23:23	1

Client Sample ID: YTC-OFFP-269-DW-080322

Lab Sample ID: 410-93634-18

Date Collected: 08/03/22 11:12

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	6.6		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
Perfluoroheptanoic acid	2.1		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
Perfluorooctanoic acid	2.4	M	1.7	1.3	0.43	ng/L		08/23/22 23:35	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
Perfluorobutanesulfonic acid	8.5		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
Perfluorohexanesulfonic acid	27		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
Perfluorooctanesulfonic acid	4.1		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/23/22 23:35	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 23:35	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93634-1

Client Sample ID: YTC-OFFP-269-DW-080322

Lab Sample ID: 410-93634-18

Date Collected: 08/03/22 11:12

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130	08/16/22 10:41	08/23/22 23:35	1
13C2 PFHxA	88		70 - 130	08/16/22 10:41	08/23/22 23:35	1
13C3 HFPO-DA	88		70 - 130	08/16/22 10:41	08/23/22 23:35	1
d5-NEtFOSAA	96		70 - 130	08/16/22 10:41	08/23/22 23:35	1

Client Sample ID: YTC-OFFP-FD-08-DW-080322

Lab Sample ID: 410-93634-19

Date Collected: 08/03/22 12:00

Matrix: Drinking Water

Date Received: 08/05/22 10:23

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	2.0		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
Perfluoroheptanoic acid	0.76	J	1.8	1.3	0.45	ng/L		08/23/22 23:47	1
Perfluorooctanoic acid	1.1	J M	1.8	1.3	0.45	ng/L		08/23/22 23:47	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
Perfluorobutanesulfonic acid	0.80	J	1.8	1.3	0.45	ng/L		08/23/22 23:47	1
Perfluorohexanesulfonic acid	2.4		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
Perfluorooctanesulfonic acid	2.1		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
NEtFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
NMeFOSAA	<1.3		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
HFPODA	<1.3		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
9Cl-PF3ONS	<1.3		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
11Cl-PF3OUdS	<1.3		1.8	1.3	0.45	ng/L		08/23/22 23:47	1
DONA	<1.3		1.8	1.3	0.45	ng/L		08/23/22 23:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	93		70 - 130	08/16/22 10:41	08/23/22 23:47	1
13C2 PFHxA	88		70 - 130	08/16/22 10:41	08/23/22 23:47	1
13C3 HFPO-DA	85		70 - 130	08/16/22 10:41	08/23/22 23:47	1
d5-NEtFOSAA	94		70 - 130	08/16/22 10:41	08/23/22 23:47	1

Yakima Training Center Off-Post PFAS

DATA REVIEW

Yakima, Washington

Perfluoroalkyl Substances (PFAS) Analysis

SDG #410-93882-1

Analyses Performed By:
Eurofins Lancaster Laboratories Environmental
Lancaster, Pennsylvania

Report #46588R

Review Level: Stage 3/4

Project: 30059933.YTC00

DATA REVIEW REPORT

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 410-93882-1 for samples collected in association with the Yakima Training Center Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP) Off-Post Private Well Investigations of Per- and Polyfluoroalkyl Substances (PFAS) in the Cleanup/Restoration Program at Active Army Installations (Arcadis, 2021). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
YTC-OFFP-305-DW-080522	410-93882-1	Drinking Water	08/05/2022		X
YTC-OFFP-296-DW-080522	410-93882-2	Drinking Water	08/05/2022		X
YTC-OFFP-297-DW-080522	410-93882-3	Drinking Water	08/05/2022		X
YTC-OFFP-294-DW-080522	410-93882-4	Drinking Water	08/05/2022		X
YTC-OFFP-301-DW-080522	410-93882-5	Drinking Water	08/05/2022		X
YTC-OFFP-86-DW-080522	410-93882-6	Drinking Water	08/05/2022		X
YTC-OFFP-293-DW-080522	410-93882-7	Drinking Water	08/05/2022		X
YTC-OFFP-298-DW-080522	410-93882-8	Drinking Water	08/05/2022		X
YTC-OFFP-295-DW-080522	410-93882-9	Drinking Water	08/05/2022		X
YTC-OFFP-FRB-11-DW-080522	410-93882-10	Drinking Water	08/05/2022		X

Note:

1. Stage 3/4 validation was performed on sample location YTC-OFFP-305-DW-080522.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) method 537 version 2.0 for drinking water. Data were reviewed in accordance with USEPA Method 537, ELLE SOP T-PFAS-WI25232, USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, EPA 910-R-18-001, November 2018, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis), and Uniform Federal Policy-Quality Assurance Project Plan Addendum Off-Post Sampling USAEC Per- and Polyfluoroalkyl Substances, Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), Yakima, Washington, August 2021 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
 - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The reported result was an estimated value with an unknown bias.
 - J+ The result was an estimated quantity, but the result may be biased high.
 - J- The result was an estimated quantity, but the result may be biased low.
 - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
 - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 Version 2.0	Drinking Water	14 days to extraction; 28 days from extraction to analysis	Trizma. Cool to <10 °C for first 48 hours.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance was acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard. The initial calibration verification (ICV) standard recoveries must be within 70-130% of their true value.

The initial calibration met criteria, and the calibration standards and initial calibration verification standard were within method specified control limits.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%R) within 70% to 130%.

All compounds associated with the continuing calibration verification standards were within the method specified control limits.

DATA REVIEW REPORT

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 50 to 150%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in EPA method 537 version 2.0 Table 4.

The ion transitions were as specified in EPA method 537 version 2.0 Table 4.

5. Isotopically labeled Standards

5.1 Surrogates

Labeled standards must be added to all field samples and QC samples prior to extraction. The surrogate recoveries associated with EPA method 537 version 2.0 must be within 70% to 130% of the true value.

All surrogate recoveries were within control limits.

5.2 Injection Internal Standards

Injection internal standards (IS) must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the average peak area calculated during the initial calibration and the peak areas must be within 70-140% from the most recent CCV.

All internal standard responses were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%. The relative percent difference (RPD) between the MS/MSD recoveries must be $\leq 30\%$.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

An MS/MSD pair was not collected for a sample location associated with this SDG.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the method specified acceptance limits of 70 to 130%.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied.

DATA REVIEW REPORT

A field duplicate was not collected for a sample location associated with this SDG.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
YTC-OFFP-305-DW-080522 (410-93882-1)	Perfluorohexanoic acid (PFHxA)	--	88	88 D
	Perfluorooctanoic acid (PFOA)	--	64	64 D
	Perfluorohexanesulfonic acid (PFHxS)	--	340	340 D
	Perfluorooctanesulfonic acid (PFOS)	--	220	220 D
YTC-OFFP-297-DW-080522 (410-93882-3)	Perfluorohexanoic acid (PFHxA)	--	100	100 D
	Perfluorobutanesulfonic acid (PFBS)	--	59	58 D
	Perfluorohexanesulfonic acid (PFHxS)	--	530	530 D
	Perfluorooctanesulfonic acid (PFOS)	--	400	400 D
YTC-OFFP-294-DW-080522 (410-93882-4)	Perfluorohexanoic acid (PFHxA)	--	80	80 D
	Perfluorohexanesulfonic acid (PFHxS)	--	360	360 D
	Perfluorooctanesulfonic acid (PFOS)	--	300	300 D
YTC-OFFP-301-DW-080522 (410-93882-5)	Perfluorohexanoic acid (PFHxA)	--	95	95 D
	Perfluorohexanesulfonic acid (PFHxS)	--	290	290 D
	Perfluorooctanesulfonic acid (PFOS)	--	310	310 D
YTC-OFFP-86-DW-080522 (410-93882-6)	Perfluorohexanesulfonic acid (PFHxS)	--	110	110 D
	Perfluorooctanesulfonic acid (PFOS)	--	72	72 D
YTC-OFFP-293-DW-080522 (410-93882-7)	Perfluorohexanesulfonic acid (PFHxS)	--	88	88 D
YTC-OFFP-295-DW-080522 (410-93882-9)	Perfluorohexanoic acid (PFHxA)	--	120	120 D
	Perfluorohexanesulfonic acid (PFHxS)	--	360	360 D
	Perfluorooctanesulfonic acid (PFOS)	--	380	380 D

Note: The laboratory did not report the original analysis, only the diluted result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

DATA REVIEW REPORT

Reported Sample Results	Qualification
Diluted sample result within calibration range.	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range.	EDJ
Original sample result greater than the calibration range	EJ

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field reagent blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate(MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field Duplicate (RPD)	X				X
Surrogate Standard %R		X		X	
Injection Internal Standard %R		X		X	
Dilution Factor		X		X	
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSD/%D		X		X	
Continuing calibration %R/%D		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculations acceptable		X		X	

DATA REVIEW REPORT

PFAS: USEPA 537 Version 2.0	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

- %RSD Relative standard deviation
- %R Percent recovery
- RPD Relative percent difference
- %D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Sharon Pennington, Arcadis

SIGNATURE:



DATE: 08/26/2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: 8/26/2022

Tier 3
PFAS Calibration Standards %D

SDG #: J93882
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/26/2022
 Page: 1
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

PFOS, 08/17/2022 Calibration Instrument 24743 Page: 227

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	39334	2395371	28.7	0.016421	1.017879	1.1661	0.404149	0.463	-12.711	-12.7	MATCH
0.926	84166	2415019	28.7	0.034851	1.080157	1.1661	0.857753	0.926	-7.370	-7.4	MATCH
2.31	248878	2531157	28.7	0.098326	1.221623	1.1661	2.41999	2.31	4.761	4.5	MATCH
4.63	441447	2322468	28.7	0.190077	1.178229	1.1661	4.678159	4.63	1.040	1	MATCH
18.5	1764607	2347698	28.7	0.751633	1.166047	1.1661	18.49915	18.5	-0.005	-0.1	MATCH
Avg RF					1.132787	No Match					

PFOS, 08/22/2022 Calibration Instrument 24743 Page: 294

Cal Conc ng/ml	Std Area	IS Area	IS Conc	Area Ratio	Calculated RF	Lab Generated Slope	Calc Amount	Tvalue ng/ml	Calculated % D	Reported % D	
0.463	36828	2062931	28.7	0.017852	1.106609	1.1787	0.434682	0.463	-6.116	-6.1	MATCH
0.926	75488	2038494	28.7	0.037031	1.147729	1.1787	0.901669	0.926	-2.628	-2.6	MATCH
2.31	222953	2092767	28.7	0.106535	1.323617	1.1787	2.594006	2.31	12.295	12	MATCH
4.63	400256	2108407	28.7	0.189838	1.17675	1.1787	4.622341	4.63	-0.165	-0.2	MATCH
18.5	1554219	2067450	28.7	0.751757	1.166238	1.1787	18.30441	18.5	-1.057	-1.2	MATCH
Avg RF					1.184189	No Match					

Lab performed a linear regression forced through zero. Therefore, avg RF will not match lab calculated slope

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS ICV CCV Standards %D

SDG #: J93882
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/26/2022
 Page: 2
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

ICV 410-287160/8 8/17/2022 21:38:00 PM Instrument 24743 Page: 368

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFHxS	221360	2390105	28.68	0.092615	1.1993	2.214795	2.36	-6.15	-6.3	Match
PFOS	216234	2390105	28.68	0.090471	1.1661	2.225104	2.39	-6.90	-6.9	Match
PFOA	794880	2954589	10	0.269032	1.0304	2.610951	2.5	4.44	4.4	Match

CCVIS 410-288136/53, 08/21/2022, 21:49 Instrument 24743 Page: 383

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFHxS	1690467	2191764	28.68	0.771281	1.1993	18.44439	18.2	1.34	1.1	Match
PFOS	1692289	2191764	28.68	0.772113	1.1661	18.98996	18.5	2.65	2.6	Match
PFOA	5842534	2864470	10	2.039656	1.0304	19.7948	20	-1.03	-1.0	Match

ICV 410-288402/8 8/22/2022 13:49 Instrument 24743 Page: 412

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFHxS	204406	2104409	28.68	0.097132	1.2693	2.194716	2.36	-7.00	-7.2	Match
PFOS	188987	2104409	28.68	0.089805	1.1787	2.185132	2.39	-8.57	-8.6	Match
PFOA	578534	2138516	10	0.270531	1.0912	2.479203	2.5	-0.83	-0.8	Match

CCVIS 410-288765/39, 08/23/2022, 20:35 Instrument 24743 Page: 426

Analyte	Analyte Area	IS Area	IS Conc	Area Ratio	Slope	Calc Amount	Tvalue	Calculated % D	Reported % D	
PFHxS	1751389	2094510	28.68	0.836181	1.2693	18.89361	18.2	3.81	3.6	Match
PFOS	1640987	2094510	28.68	0.783471	1.1787	19.06332	18.5	3.04	3.0	Match
PFOA	4820884	2246160	10	2.146278	1.0912	19.66897	20	-1.66	-1.7	Match

Concentration ng/ml = (Peak area ratio/slope) x DF x IS concentration

Tier 3
PFAS LCS

SDG #: J93882
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/26/2022
Page: 3
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

LCS ID LCS 410-287129/2-A
ANALYTE PFOS
REPORTED LCS %R 97
REPORTED LCSD %R _____
REPORTED RPD _____

Page 97

$$\%R = \frac{100 * \text{LCS Concentration}}{\text{LCS TV}}$$

$$\text{RPD} = \frac{100 * | \text{LCS \%R} - \text{LCSD \%R} |}{\text{Average of LCS LCSD \%R}}$$

LCS Concentration 18.3
LCSD Concentration _____
LCS TV 19
LCSD TV _____

LCS %R 96.32 MATCH
LCSD %R _____
RPD _____

iding of the true value

Tier 3
PFAS Sample Concentration

SDG #: J93882
 Lab: Eurofins Lancaster
 Project: Yakima Training Center

Date: 8/26/2022
 Page: 4
 Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-305-DW-080522 DL Lab ID: 410-93882-1 DL Page 115 Dilution = 10

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFOA	500391	2586140	10	0.19349	1.0912	1.77	1	275.3	64.41	64	Match
PFOS	594407	2404877	28.68	0.247167	1.1787	6.01	1	275.3	218.45	220	Match

Sample ID: YTC-OFFP-297-DW-080522 DL Lab ID: 410-93882-3 DL Page 136 Dilution = 10

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxS	1616524	2433457	28.68	0.664291	1.2693	15.01	1	282.6	531.13	530	Match
PFOS	1137026	2433457	28.68	0.467247	1.1787	11.37	1	282.6	402.30	400	Match

Sample ID: YTC-OFFP-294-DW-080522 DL Lab ID: 410-93882-4 DL Page 150 Dilution = 10

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxS	1011982	2315262	28.68	0.437092	1.2693	9.88	1	271.7	363.49	360	Match
PFOS	785199	2315262	28.68	0.33914	1.1787	8.25	1	271.7	303.71	300	Match

Sample ID: YTC-OFFP-301-DW-080522 DL Lab ID: 410-93882-5 DL Page 164 Dilution = 10

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxS	920967	2460902	28.68	0.37424	1.2693	8.46	1	293.9	287.72	290	Match
PFOS	925525	2460902	28.68	0.376092	1.1787	9.15	1	293.9	311.37	310	Match

Sample ID: YTC-OFFP-86-DW-080522 DL Lab ID: 410-93882-6 DL Page 213 Dilution = 10

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxS	322049	2351686	28.68	0.136944	1.2693	3.09	1	285.4	108.42	110	Match
PFOS	198941	2351686	28.68	0.084595	1.1787	2.06	1	285.4	72.12	72	Match

Sample ID: YTC-OFFP-295-DW-080522 DL Lab ID: 410-93882-9 DL Page 213 Dilution = 10

Analyte	Area	IS Area	IS Conc ng/ml	Area Ratio	Slope	Calculated Amount ng/ml	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxS	1091538	2360978	28.68	0.462325	1.2693	10.45	1	286.2	365.00	360	Match
PFOS	1044821	2360978	28.68	0.442537	1.1787	10.77	1	286.2	376.23	380	Match

Calculated Amount ng/L = ((Area Ratio x IS Conc)/Avg RF)

Calculated ng/L = DF x ((calculated ng/ml x 1 ml) / extracted sample volume L)

Tier 3
PFAS Surrogate

SDG #: J93882
Lab: Eurofins Lancaster
Project: Yakima Training Center

Date: 8/26/2022
Page: 5
Validated by: SKP

Method: EPA Method 537.1, Version 2.0

Sample ID: YTC-OFFP-86-DW-080522 DL Lab ID: 410-93882-6 DL Page 178

Surrogate 13C2 PFDA
REPORTED %R 98

$$\%R = \frac{100 * \text{Surrogate Found Concentration}}{\text{Surrogate TV}}$$

Found Concentration 9.809
Surrogate TV 10.0
%R 98.1 MATCH

CHAIN OF CUSTODY AND SAMPLE ANALYSIS DATA SHEETS



Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 410-93882-1

Login Number: 93882

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 1

Creator: McBeth, Jessica

Question	Answer	Comment
The cooler's custody seal is intact.	True	
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 ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	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	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace $>6\text{mm}$ in diameter (none, if from WV)?	True	

Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93882-1

Qualifiers

LCMS

Qualifier	Qualifier Description
D	The reported value is from a dilution.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
M	Manual integrated compound.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
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

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93882-1

Client Sample ID: YTC-OFFP-305-DW-080522

Lab Sample ID: 410-93882-1

Date Collected: 08/05/22 09:55

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	37		1.8	1.4	0.45	ng/L		08/23/22 21:10	1
Perfluorononanoic acid	4.3		1.8	1.4	0.45	ng/L		08/23/22 21:10	1
Perfluorodecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/23/22 21:10	1
Perfluorotridecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/23/22 21:10	1
Perfluorotetradecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/23/22 21:10	1
Perfluorobutanesulfonic acid	44	M	1.8	1.4	0.45	ng/L		08/23/22 21:10	1
NEtFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/23/22 21:10	1
NMeFOSAA	<1.4		1.8	1.4	0.45	ng/L		08/23/22 21:10	1
Perfluoroundecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/23/22 21:10	1
Perfluorododecanoic acid	<1.4		1.8	1.4	0.45	ng/L		08/23/22 21:10	1
HFPODA	<1.4		1.8	1.4	0.45	ng/L		08/23/22 21:10	1
9CI-PF3ONS	<1.4		1.8	1.4	0.45	ng/L		08/23/22 21:10	1
11CI-PF3OUdS	<1.4		1.8	1.4	0.45	ng/L		08/23/22 21:10	1
DONA	<1.4		1.8	1.4	0.45	ng/L		08/23/22 21:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	105		70 - 130	08/17/22 17:20	08/23/22 21:10	1
13C2 PFHxA	94		70 - 130	08/17/22 17:20	08/23/22 21:10	1
13C3 HFPO-DA	94		70 - 130	08/17/22 17:20	08/23/22 21:10	1
d5-NEtFOSAA	89		70 - 130	08/17/22 17:20	08/23/22 21:10	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	88	D	18	14	4.5	ng/L		08/23/22 21:21	10
Perfluorooctanoic acid	64	D	18	14	4.5	ng/L		08/23/22 21:21	10
Perfluorohexanesulfonic acid	340	D	18	14	4.5	ng/L		08/23/22 21:21	10
Perfluorooctanesulfonic acid	220	D	18	14	4.5	ng/L		08/23/22 21:21	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	89		70 - 130	08/17/22 17:20	08/23/22 21:21	10
13C2 PFHxA	84		70 - 130	08/17/22 17:20	08/23/22 21:21	10
13C3 HFPO-DA	83		70 - 130	08/17/22 17:20	08/23/22 21:21	10
d5-NEtFOSAA	88		70 - 130	08/17/22 17:20	08/23/22 21:21	10

Client Sample ID: YTC-OFFP-296-DW-080522

Lab Sample ID: 410-93882-2

Date Collected: 08/05/22 09:35

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	17		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
Perfluoroheptanoic acid	6.3		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
Perfluorooctanoic acid	7.8		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
Perfluorononanoic acid	0.46	J	1.7	1.3	0.43	ng/L		08/23/22 21:33	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
Perfluorobutanesulfonic acid	14		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
Perfluorohexanesulfonic acid	52		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
Perfluorooctanesulfonic acid	27		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 21:33	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93882-1

Client Sample ID: YTC-OFFP-296-DW-080522

Lab Sample ID: 410-93882-2

Date Collected: 08/05/22 09:35

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/23/22 21:33	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 21:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	95		70 - 130	08/17/22 17:20	08/23/22 21:33	1
13C2 PFHxA	94		70 - 130	08/17/22 17:20	08/23/22 21:33	1
13C3 HFPO-DA	88		70 - 130	08/17/22 17:20	08/23/22 21:33	1
d5-NEtFOSAA	90		70 - 130	08/17/22 17:20	08/23/22 21:33	1

Client Sample ID: YTC-OFFP-297-DW-080522

Lab Sample ID: 410-93882-3

Date Collected: 08/05/22 09:20

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	36		1.8	1.3	0.44	ng/L		08/22/22 00:19	1
Perfluorooctanoic acid	68		1.8	1.3	0.44	ng/L		08/22/22 00:19	1
Perfluorononanoic acid	6.6		1.8	1.3	0.44	ng/L		08/22/22 00:19	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 00:19	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 00:19	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 00:19	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 00:19	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 00:19	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 00:19	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 00:19	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 00:19	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/22/22 00:19	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/22/22 00:19	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 00:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	97		70 - 130	08/17/22 17:20	08/22/22 00:19	1
13C2 PFHxA	93		70 - 130	08/17/22 17:20	08/22/22 00:19	1
13C3 HFPO-DA	94		70 - 130	08/17/22 17:20	08/22/22 00:19	1
d5-NEtFOSAA	86		70 - 130	08/17/22 17:20	08/22/22 00:19	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	100	D	18	13	4.4	ng/L		08/23/22 21:44	10
Perfluorobutanesulfonic acid	59	D	18	13	4.4	ng/L		08/23/22 21:44	10
Perfluorohexanesulfonic acid	530	D	18	13	4.4	ng/L		08/23/22 21:44	10
Perfluorooctanesulfonic acid	400	D	18	13	4.4	ng/L		08/23/22 21:44	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	86		70 - 130	08/17/22 17:20	08/23/22 21:44	10
13C2 PFHxA	83		70 - 130	08/17/22 17:20	08/23/22 21:44	10

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93882-1

Client Sample ID: YTC-OFFP-297-DW-080522

Lab Sample ID: 410-93882-3

Date Collected: 08/05/22 09:20

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	81		70 - 130	08/17/22 17:20	08/23/22 21:44	10
d5-NEtFOSAA	93		70 - 130	08/17/22 17:20	08/23/22 21:44	10

Client Sample ID: YTC-OFFP-294-DW-080522

Lab Sample ID: 410-93882-4

Date Collected: 08/05/22 08:57

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	26		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
Perfluorooctanoic acid	50		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
Perfluorononanoic acid	4.9		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
Perfluorodecanoic acid	<1.4		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
Perfluorotridecanoic acid	<1.4		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
Perfluorotetradecanoic acid	<1.4		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
Perfluorobutanesulfonic acid	50		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
NEtFOSAA	<1.4		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
NMeFOSAA	<1.4		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
Perfluoroundecanoic acid	<1.4		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
Perfluorododecanoic acid	<1.4		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
HFPODA	<1.4		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
9CI-PF3ONS	<1.4		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
11CI-PF3OUdS	<1.4		1.8	1.4	0.46	ng/L		08/23/22 21:56	1
DONA	<1.4		1.8	1.4	0.46	ng/L		08/23/22 21:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103		70 - 130	08/17/22 17:20	08/23/22 21:56	1
13C2 PFHxA	92		70 - 130	08/17/22 17:20	08/23/22 21:56	1
13C3 HFPO-DA	91		70 - 130	08/17/22 17:20	08/23/22 21:56	1
d5-NEtFOSAA	93		70 - 130	08/17/22 17:20	08/23/22 21:56	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	80	D	18	14	4.6	ng/L		08/23/22 22:07	10
Perfluorohexanesulfonic acid	360	D	18	14	4.6	ng/L		08/23/22 22:07	10
Perfluorooctanesulfonic acid	300	D	18	14	4.6	ng/L		08/23/22 22:07	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	87		70 - 130	08/17/22 17:20	08/23/22 22:07	10
13C2 PFHxA	86		70 - 130	08/17/22 17:20	08/23/22 22:07	10
13C3 HFPO-DA	85		70 - 130	08/17/22 17:20	08/23/22 22:07	10
d5-NEtFOSAA	87		70 - 130	08/17/22 17:20	08/23/22 22:07	10

Client Sample ID: YTC-OFFP-301-DW-080522

Lab Sample ID: 410-93882-5

Date Collected: 08/05/22 10:21

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	33		1.7	1.3	0.43	ng/L		08/23/22 22:19	1
Perfluorooctanoic acid	42		1.7	1.3	0.43	ng/L		08/23/22 22:19	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93882-1

Client Sample ID: YTC-OFFP-301-DW-080522

Lab Sample ID: 410-93882-5

Date Collected: 08/05/22 10:21

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorononanoic acid	1.9		1.7	1.3	0.43	ng/L		08/23/22 22:19	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 22:19	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 22:19	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 22:19	1
Perfluorobutanesulfonic acid	45		1.7	1.3	0.43	ng/L		08/23/22 22:19	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 22:19	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 22:19	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 22:19	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/23/22 22:19	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 22:19	1
9Cl-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/23/22 22:19	1
11Cl-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/23/22 22:19	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/23/22 22:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	93		70 - 130	08/17/22 17:20	08/23/22 22:19	1
13C2 PFHxA	88		70 - 130	08/17/22 17:20	08/23/22 22:19	1
13C3 HFPO-DA	90		70 - 130	08/17/22 17:20	08/23/22 22:19	1
d5-NEtFOSAA	87		70 - 130	08/17/22 17:20	08/23/22 22:19	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	95	D	17	13	4.3	ng/L		08/23/22 22:30	10
Perfluorohexanesulfonic acid	290	D	17	13	4.3	ng/L		08/23/22 22:30	10
Perfluorooctanesulfonic acid	310	D	17	13	4.3	ng/L		08/23/22 22:30	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	84		70 - 130	08/17/22 17:20	08/23/22 22:30	10
13C2 PFHxA	79		70 - 130	08/17/22 17:20	08/23/22 22:30	10
13C3 HFPO-DA	75		70 - 130	08/17/22 17:20	08/23/22 22:30	10
d5-NEtFOSAA	83		70 - 130	08/17/22 17:20	08/23/22 22:30	10

Client Sample ID: YTC-OFFP-86-DW-080522

Lab Sample ID: 410-93882-6

Date Collected: 08/05/22 09:17

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	32		1.8	1.3	0.44	ng/L		08/23/22 22:54	1
Perfluoroheptanoic acid	9.6		1.8	1.3	0.44	ng/L		08/23/22 22:54	1
Perfluorooctanoic acid	14		1.8	1.3	0.44	ng/L		08/23/22 22:54	1
Perfluorononanoic acid	1.3	J	1.8	1.3	0.44	ng/L		08/23/22 22:54	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:54	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:54	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:54	1
Perfluorobutanesulfonic acid	27		1.8	1.3	0.44	ng/L		08/23/22 22:54	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:54	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:54	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:54	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:54	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:54	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93882-1

Client Sample ID: YTC-OFFP-86-DW-080522

Lab Sample ID: 410-93882-6

Date Collected: 08/05/22 09:17

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:54	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:54	1
DONA	<1.3		1.8	1.3	0.44	ng/L		08/23/22 22:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	108		70 - 130	08/17/22 17:20	08/23/22 22:54	1
13C2 PFHxA	98		70 - 130	08/17/22 17:20	08/23/22 22:54	1
13C3 HFPO-DA	96		70 - 130	08/17/22 17:20	08/23/22 22:54	1
d5-NEtFOSAA	94		70 - 130	08/17/22 17:20	08/23/22 22:54	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	110	D	18	13	4.4	ng/L		08/23/22 23:05	10
Perfluorooctanesulfonic acid	72	D	18	13	4.4	ng/L		08/23/22 23:05	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	98		70 - 130	08/17/22 17:20	08/23/22 23:05	10
13C2 PFHxA	89		70 - 130	08/17/22 17:20	08/23/22 23:05	10
13C3 HFPO-DA	87		70 - 130	08/17/22 17:20	08/23/22 23:05	10
d5-NEtFOSAA	97		70 - 130	08/17/22 17:20	08/23/22 23:05	10

Client Sample ID: YTC-OFFP-293-DW-080522

Lab Sample ID: 410-93882-7

Date Collected: 08/05/22 10:11

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	17		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
Perfluoroheptanoic acid	5.5		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
Perfluorooctanoic acid	8.3		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
Perfluorononanoic acid	0.47	J	1.7	1.3	0.42	ng/L		08/22/22 01:17	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
Perfluorobutanesulfonic acid	15		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
Perfluorooctanesulfonic acid	54		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
NEtFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
NMeFOSAA	<1.3		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
HFPODA	<1.3		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
9CI-PF3ONS	<1.3		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.42	ng/L		08/22/22 01:17	1
DONA	<1.3		1.7	1.3	0.42	ng/L		08/22/22 01:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	92		70 - 130	08/17/22 17:20	08/22/22 01:17	1
13C2 PFHxA	96		70 - 130	08/17/22 17:20	08/22/22 01:17	1
13C3 HFPO-DA	95		70 - 130	08/17/22 17:20	08/22/22 01:17	1
d5-NEtFOSAA	93		70 - 130	08/17/22 17:20	08/22/22 01:17	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93882-1

Client Sample ID: YTC-OFFP-293-DW-080522

Lab Sample ID: 410-93882-7

Date Collected: 08/05/22 10:11

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanesulfonic acid	88	D	17	13	4.2	ng/L		08/23/22 23:17	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	90		70 - 130	08/17/22 17:20	08/23/22 23:17	10
13C2 PFHxA	86		70 - 130	08/17/22 17:20	08/23/22 23:17	10
13C3 HFPO-DA	85		70 - 130	08/17/22 17:20	08/23/22 23:17	10
d5-NEtFOSAA	96		70 - 130	08/17/22 17:20	08/23/22 23:17	10

Client Sample ID: YTC-OFFP-298-DW-080522

Lab Sample ID: 410-93882-8

Date Collected: 08/05/22 09:31

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	9.2		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
Perfluoroheptanoic acid	3.5		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
Perfluorooctanoic acid	6.0		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
Perfluorononanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
Perfluorobutanesulfonic acid	8.5		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
Perfluorohexanesulfonic acid	34		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
Perfluorooctanesulfonic acid	10		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
NEtFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
NMeFOSAA	<1.3		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
HFPODA	<1.3		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
9CI-PF3ONS	<1.3		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.43	ng/L		08/22/22 01:28	1
DONA	<1.3		1.7	1.3	0.43	ng/L		08/22/22 01:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	95		70 - 130	08/17/22 17:20	08/22/22 01:28	1
13C2 PFHxA	98		70 - 130	08/17/22 17:20	08/22/22 01:28	1
13C3 HFPO-DA	94		70 - 130	08/17/22 17:20	08/22/22 01:28	1
d5-NEtFOSAA	96		70 - 130	08/17/22 17:20	08/22/22 01:28	1

Client Sample ID: YTC-OFFP-295-DW-080522

Lab Sample ID: 410-93882-9

Date Collected: 08/05/22 08:57

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluoroheptanoic acid	42		1.7	1.3	0.44	ng/L		08/23/22 23:28	1
Perfluorooctanoic acid	47		1.7	1.3	0.44	ng/L		08/23/22 23:28	1
Perfluorononanoic acid	1.9		1.7	1.3	0.44	ng/L		08/23/22 23:28	1
Perfluorodecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/23/22 23:28	1
Perfluorotridecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/23/22 23:28	1
Perfluorotetradecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/23/22 23:28	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Yakima Training Center (YTC)

Job ID: 410-93882-1

Client Sample ID: YTC-OFFP-295-DW-080522

Lab Sample ID: 410-93882-9

Date Collected: 08/05/22 08:57

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid	56		1.7	1.3	0.44	ng/L		08/23/22 23:28	1
NEtFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/23/22 23:28	1
NMeFOSAA	<1.3		1.7	1.3	0.44	ng/L		08/23/22 23:28	1
Perfluoroundecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/23/22 23:28	1
Perfluorododecanoic acid	<1.3		1.7	1.3	0.44	ng/L		08/23/22 23:28	1
HFPODA	<1.3		1.7	1.3	0.44	ng/L		08/23/22 23:28	1
9CI-PF3ONS	<1.3		1.7	1.3	0.44	ng/L		08/23/22 23:28	1
11CI-PF3OUdS	<1.3		1.7	1.3	0.44	ng/L		08/23/22 23:28	1
DONA	<1.3		1.7	1.3	0.44	ng/L		08/23/22 23:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	107		70 - 130	08/17/22 17:20	08/23/22 23:28	1
13C2 PFHxA	94		70 - 130	08/17/22 17:20	08/23/22 23:28	1
13C3 HFPO-DA	93		70 - 130	08/17/22 17:20	08/23/22 23:28	1
d5-NEtFOSAA	93		70 - 130	08/17/22 17:20	08/23/22 23:28	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	120	D	17	13	4.4	ng/L		08/23/22 23:40	10
Perfluorohexanesulfonic acid	360	D	17	13	4.4	ng/L		08/23/22 23:40	10
Perfluorooctanesulfonic acid	380	D	17	13	4.4	ng/L		08/23/22 23:40	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	91		70 - 130	08/17/22 17:20	08/23/22 23:40	10
13C2 PFHxA	87		70 - 130	08/17/22 17:20	08/23/22 23:40	10
13C3 HFPO-DA	83		70 - 130	08/17/22 17:20	08/23/22 23:40	10
d5-NEtFOSAA	84		70 - 130	08/17/22 17:20	08/23/22 23:40	10

Client Sample ID: YTC-OFFP-FRB-11-DW-080522

Lab Sample ID: 410-93882-10

Date Collected: 08/05/22 10:44

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorohexanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
Perfluoroheptanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
Perfluorooctanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
Perfluorononanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
Perfluorodecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
Perfluorotridecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
Perfluorotetradecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
Perfluorobutanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
Perfluorohexanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
Perfluorooctanesulfonic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
NEtFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
NMeFOSAA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
Perfluoroundecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
Perfluorododecanoic acid	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
HFPODA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
9CI-PF3ONS	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1
11CI-PF3OUdS	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Yakima Training Center (YTC)

Job ID: 410-93882-1

Client Sample ID: YTC-OFFP-FRB-11-DW-080522

Lab Sample ID: 410-93882-10

Date Collected: 08/05/22 10:44

Matrix: Drinking Water

Date Received: 08/09/22 10:06

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
DONA	<1.3		1.8	1.3	0.44	ng/L		08/22/22 01:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	94		70 - 130	08/17/22 17:20	08/22/22 01:51	1
13C2 PFHxA	91		70 - 130	08/17/22 17:20	08/22/22 01:51	1
13C3 HFPO-DA	87		70 - 130	08/17/22 17:20	08/22/22 01:51	1
d5-NEtFOSAA	84		70 - 130	08/17/22 17:20	08/22/22 01:51	1