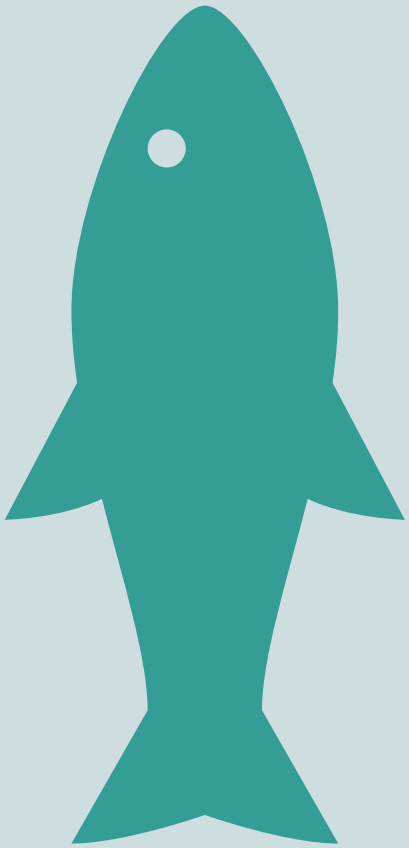
Final Report:
Evaluation of PFAS in Commercial Fish Tissue

2023



Washington State Department of HEALTH

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Executive Summary

Per- and polyfluoroalkyl substances (PFASs) have been increasingly identified in fish. PFAS are used in many industrial and consumer applications, such as water-, stain-, and oil-repelling coatings, and fire-fighting foams. In Washington state, PFAS have been detected in surface waters, groundwater, wastewater treatment plant (WWTP) effluent, freshwater and marine sediments, freshwater fish tissue, and osprey eggs.

This project measured a subset of PFAS, with a history of detection in fish, in the top ten most purchased fish from Washington grocery stores. A total of 50 samples were analyzed. The results have been compared with what is known about PFAS incidence in freshwater fish throughout Washington state and to what is known currently about commercial fish available to consumers.

All PFOS concentrations were below DOH's PFOS screening value for the general population and the high consumer population. The summation of PFAS exceeded the general population screening value in only one sample. Therefore, from this market analysis we conclude that PFAS exposure risk from consumption of these commercial fish is low and, that these are good alternative sources of dietary fish when consumption advisories recommend avoiding fish that are high in PFOS.

DOH encourages all Washingtonians to eat at least eight to twelve ounces of fish per week in accordance with The Dietary Guidelines for Americans. People may eat more than this amount of fish weekly; however frequent consumers should consider taking steps to reduce exposure to contaminants in the fish that they eat. Some general guidance is as follows:

- Eat a variety of fish that are low in contaminants according to guidance provided by DOH (http://www.doh.wa.gov/fish/) and local health agencies.
- If consuming self-caught fish: consume younger, smaller fish (within legal limits). These fish typically contain lower levels of accumulative contaminants than older, larger fish.
- When cleaning fish, remove the skin, fat, and internal organs before cooking; this will help to reduce the amount of some contaminants.
- Grill, bake, or broil fish so that fat drips off while cooking. (Advice is for fat stored contaminants like PCBs)
- Young children and small adults should eat proportionally smaller meal sizes (see Table 3).

Introduction

Prior investigations by the Department of Health (DOH) have shown that, for most Washingtonians, fish purchased from commercial markets/grocery stores are consumed at the highest rates (DOH 2008). In 2004-05, DOH tested the top purchased fish from markets in Washington for common persistent, bioaccumulative, and toxic compounds (PBTs) to allow seafood consumers to make informed decisions on their purchases regarding environmental contaminant risk (DOH 2012). In the years since this work was completed a large class of chemicals known as per- and polyfluoroalkyl substances (PFASs) have been increasingly identified in fish. PFAS are used in many industrial and consumer applications, such as water-, stain-, and oil-repelling coatings, and fire-fighting foams. Some of the chemicals in this group such as perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) have been identified as PBTs.

In Washington state, PFAS have been detected in surface waters, groundwater, wastewater treatment plant (WWTP) effluent, freshwater and marine sediments, freshwater fish tissue, and osprey eggs (Ecology 2010, Ecology 2017). PFAS concentrations are highest in urban surface water and surface waters receiving WWTP effluent. Stormwater, WWTP effluent, and runoff of aqueous film-forming foam (AFFF) are thought to be primary ways that PFAS are delivered to our waterbodies. In 2016 and 2018 surveys of freshwater fish conducted by the Department of Ecology (Ecology), found that some species of fish from Washington's urban rivers and lakes had fillet concentrations of PFOS that exceeded DOH's screening level of 1.8 ppb and 0.6 ppb for the general population and high consumers, respectively (DOH 2022). Fish liver was found to contain higher levels than fillets and more frequently contained measurable amounts of other PFAS. Marine species from Puget Sound (mussels, Chinook salmon, and English sole) have only limited sampling data for human health assessment but levels of all PFAS including PFOS were near or below DOH's provisional screening levels in these fillets (Ecology 2021). PFOS was the dominant PFAS detected followed by PFOA.

Health concerns for these PFAS are based on adverse outcomes observed in laboratory animals and supporting evidence from epidemiological studies. In animals, the best studied PFAS produce developmental and reproductive toxicity, liver toxicity, immune toxicity, testicular and thyroid toxicity, endocrine disruption (especially altered testosterone and thyroid hormones) and increased tumors in liver and other organs (EPA 2016a, EPA 2016b, ATSDR 2021). Supporting evidence from epidemiological studies show associations between the best studied PFAS and lower fetal growth, reduced immune response to vaccines, higher serum cholesterol and liver enzymes, and increased rates of kidney and testicular cancer. PFOS, PFOA, and their known precursors were largely phased out in the United States in the mid-2000s and early 2010s.

Data on PFAS levels in fish that are consumed the most by Washingtonians are lacking. Limited

commercial fish and shellfish have been sampled for PFAS in other states, but no sampling has occurred in WA markets (Ruffle et al 2020). Furthermore, it is not known how sport caught freshwater fish species PFAS concentrations compare with seafood purchased from grocery stores. Current data are inadequate to provide much needed consumption advice based on these emerging contaminants to allow consumers to make safe choices.

This project measured a subset of PFAS, with a history of detection in fish, in commonly purchased fish from Washington grocery stores. The results have been compared with what is known about PFAS incidence in freshwater fish throughout Washington state and to what is known currently about commercial fish available to consumers. These results allow consumers to understand fish meal options that are lower in PFAS contaminants.

Methods

Fish collection was conducted in collaboration with Western Washington University's Department of Environmental Science in the College of the Environment, July through November 2021. Fish samples were purchased from major grocery stores in cities covering six counties (Whatcom, Skagit, Snohomish, King, Pierce, and Thurston). Counties were selected as they represent the majority of the population of Washington state and for ease of sampling.

Three major seafood suppliers in the western Washington area (LusAmerica, Pacific Seafood, and Ocean Beauty) provided the retail chains they sold the most fish to. Retailers also had to be accessible (i.e. no membership requirement) for inclusion resulting in a list consisting of QFC, Fred Meyer, Whole Foods, Safeway, Albertson's, Grocery Outlet, and Haggen. A total of 250 stores were identified. To ensure that the stores selected served socioeconomically diverse communities, addresses were overlaid with the Washington State Department of Health's Environmental Disparities (ED) map filtered by socioeconomic factors to further classify stores. The ED map defines socioeconomic rankings from 1-10 (1 = poorer areas, 10 = affluent areas), for simplicity socioeconomic rankings were binned low (1-4), medium (5-7), and high (8-10) and stores were categorized accordingly. Stores were than randomly selected from each category/location combo to build the location list (Table A1). Two stores, "Medium/Skagit" and "Low/Whatcom", were the only stores for their socioeconomic category and location and were therefore selected by default, as the goal was to sample from every category/county combination if possible.

Ten fish product/species were originally selected for sampling based on revenue sales from Washington markets as well as listing by the National Marine Fisheries Services (NMFS) as used in previous studies; canned white (WTN) and light tuna (LTN) packed in water, catfish (CAT), cod (COD), flounder (FDR), halibut (HAL), red snapper (RSP), pollock (POL), Chinook salmon (CHK), and tilapia (TIL). Fish samples were purchased as available in store.

Individual fish samples (n = 250) were stored in original packaging in plastic bags on ice during

collection and transport to the prep lab. Upon arrival to Washington State Department of Ecology's sample prep lab, samples were stored (-20°C to 4°C) until processing and aliquoting. Fish samples were processed and homogenized according to Ecology's Standard Operating Procedures for Resecting Finfish Whole Body, Body Parts, or Tissue Samples (Sandvik, 2018a and 2018b). Composite fish samples were composed of 5 individual fish fillets, unless otherwise noted (Table A2). Fish tissue was homogenized using a stainless-steel grinder until a consistent color and texture was reached. Grinders were cleaned with soap and water known to be below detection for PFAS and rinsed with methanol before each homogenization. Homogenized samples were placed in HDPE jars, frozen, and sent to the Manchester Environmental Lab (MEL) with blue ice. A total of five composite samples for each of the ten fish species were analyzed, 50 samples total.

Laboratory work was completed by MEL and samples were processed in accordance with EPA method 8327-modified for PFAS compounds, see Table 1 for a complete list of analytes. All laboratory samples were analyzed in accordance with established standard laboratory methods, procedures, and QA procedures. Method reporting limits ranged from 0.1 – 0.2 ug/kg comprehensive details for entire analysis are available in Appendix B. All blanks were below LLOQ and one analyte (M6-2 FTS) for one QC returned outside the acceptable recovery criteria. This QC was an SRM evaluating PFOS recovery, therefore, the recovery exceedance for the surrogate M6-2 FTS was deemed not impactful.

Table 1. List of PFAS analyzed in each composite sample.

PFAS	CAS #
6:2 Fluorotelomer sulfonic acid	27619-97-2
Perfluorobutanesulfonic acid	375-73-5
Perfluorodecanoic acid	335-76-2
Perfluorododecanoic acid	307-55-1
Perfluorohexanesulfonic acid	355-46-4
Perfluorohexanoic acid	307-24-4
Perfluorononanoic acid	375-95-1
Perfluorooctanesulfonamide	754-91-6
Perfluorooctanesulfonic acid	1763-23-1
Perfluorooctanoic acid	335-67-1
Perfluorotetradecanoic acid	376-06-7
Perfluorotridecanoic acid	72629-94-8
Perfluoroundecanoic acid	2058-94-8

Detailed methods for the derivation of fish tissue screening levels are discussed in DOHs Fish Advisory Evaluation: PFOS in Fish from Lakes Meridian, Sammamish, and Washington (DOH 2022) and in Volume 1 of EPA's Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories (EPA 2000a). Briefly, DOH derived the health protective screening value for PFOS in fish tissue as follows:

$$Screening\ Level\ (SL_{nc}) = \frac{RfD\ x\ BW\ x\ UCF}{CR} \times RSC$$

Using a PFOS reference dose (RfD) of 3 x 10^{-6} mg/kg-day, from the current State Action Level (2021) in drinking water based on Dong et. al. 2011; consumption rates of 8 and 23 meals per month, one meal is defined as one 8-oz serving (6-oz. cooked), for general and high consumer groups respectively; a bodyweight of 70 kg; and a relative source contribution (RSC) of 0.5. Yeilding PFOS fish tissue screening levels of 1.8 ug/kg for general consumption and 0.6 ug/kg for high consumption.

Results and Discussion

Of the 50 composite samples analyzed, 33 contained detectable PFAS, however, only 14 contained PFAS above the lower limit of quantitation (Table 2). The long chain perfluorocarboxylic acid (PFCA) perfluoroundecanoic acid (PFUnDA - C11 PFCA) was the most frequently detected and quantified across the sample set. Nine samples detected PFOS, with three samples containing quantifiable PFOS concentrations. PFAS concentrations individual or summed fell below the general population PFOS screening level of 1.8 ug/kg in all but one sample (CAT-11 discussed below).

The PFAS observed were consistent with those that have been reported in storebought fish tissue previously (FDA 2022). This observance pattern was also consistent with the Department of Ecology data for freshwater areas collected in 2016 and 2018 (Ecology 2017 and 2022). However, the concentrations for PFAS in Washington freshwater fish from the Ecology data are greater than those observed here, particularly in urban areas. Concentrations for PFOS in freshwater fish throughout Washington state from 2016 ranged from approximately 1 – 70 µg/kg depending on species and location with the results from 2018 being similar. Similarly, the data showed that long chain PFCA concentrations were higher in Washington caught freshwater fish than commercially purchased fish.

Recently the FDA released a report evaluating PFAS concentrations in commercially purchased fish (FDA 2022). The FDA method detection limit was lower than what the MEL was able to achieve (e.g. 0.039 ug/kg for PFOS) for our analysis and therefore the FDA did quantify more PFAS. Broadly our findings corroborate the FDA data where overlap does exist with concentrations for tuna, cod, tilapia, and pollock below 1 ug/kg for all analytes and many below 0.1 ug/kg, which are reflected in our J flagged detections.

Some product/species-specific relationships were observed. White tuna contained the highest sum concentrations of PFAS, the greatest number of individual PFAS compounds, and the only quantifiable PFOS concentrations. Perfluorononanoic acid (PFNA – C9 PFCA) was quantified in

only one product/species, flounder. All flounder samples that had an origin listed were from the U.S. and several were identified as “Dover sole”, however, a species-specific accumulation mechanism or common exposure route cannot be described at this time nor ruled out. Tilapia was the only fish product/species in our survey that did not exhibit a single PFAS detection. This result also agrees with the FDA seafood survey (2022) which similarly found tilapia below detection for most PFAS. One sample, a single composite catfish, had 6:2 fluorotelomer sulfonate (FtS) at levels above the PFOS screening value, however, as there are currently no health protective values for 6:2 FtS we are unable to make health risk conclusions regarding its presence. The MEL did re-extract and re-analyze this sample and verified that it was not contamination in their process. Additionally, no other composite samples showed a presence of 6:2 FtS either quantified or detected. When evaluating this sample further DOH determined that the packaging information was not sufficient to provide meaningful data if the samples that made up the composite were to be analyzed individually; all were listed as from the USA. One of the samples in this composite was wrapped in butcher paper, some food contact papers are known to contain PFAS (Shaider et. al. 2017), however, the probability of contamination from butcher paper or otherwise during sample prep was deemed low as many other samples were wrapped in butcher paper and processed in an identical manner on the same day and 6:2 FtS was not observed in any other sample. These results indicate that 6:2 FtS is important to monitor for in future fish tissue studies as an infrequent but potentially significant source of PFAS.

Table 2. Composite fish tissue samples. Bold values were quantified. Italics with J flag denotes PFAS were detected but below the LLOQ, reported concentrations are estimates. CAT = Catfish, CHK = Chinook, COD = Cod, FDR = Flounder, HAL = Halibut, LTN = Light Tuna, POL = Pollock, RSP = Red Snapper, WTN = White Tuna.

							µg/kg ww						
Sample	PFHxA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFBS	PFHxS	PFOS	PFOSA	6:2 FtS
LTN 01	< LOD	< LOD	< LOD	< LOD	*0.09 J*	< LOD	< LOD	< LOD	< LOD	< LOD	*0.07 J*	< LOD	< LOD
LTN 02	< LOD	< LOD	< LOD	< LOD	**0.23**	< LOD	**0.29**	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
LTN 03	< LOD	< LOD	< LOD	< LOD	*0.08 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
LTN 04	< LOD	< LOD	< LOD	< LOD	*0.08 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
LTN 05	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
WTN 06	< LOD	< LOD	< LOD	< LOD	*0.08 J*	< LOD	< LOD	< LOD	< LOD	< LOD	*0.07 J*	< LOD	< LOD
WTN 07	< LOD	< LOD	< LOD	< LOD	**0.36**	< LOD	**0.25**	< LOD	< LOD	< LOD	*0.11 J*	< LOD	< LOD
WTN 08	< LOD	< LOD	< LOD	*0.07 J*	**0.24**	*0.07 J*	**0.35**	*0.07 J*	< LOD	< LOD	**0.2**	< LOD	< LOD
WTN 09	< LOD	< LOD	< LOD	< LOD	**0.11**	< LOD	*0.07 J*	< LOD	< LOD	< LOD	**0.11**	*0.08 J*	< LOD
WTN 10	< LOD	< LOD	< LOD	< LOD	**0.24**	< LOD	**0.24**	< LOD	< LOD	< LOD	**0.22**	< LOD	< LOD
CAT 11	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	**4.54**
CAT 12	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
CAT 13	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
CAT 14	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
CAT 15	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
COD 16	< LOD	< LOD	*0.11 J*	< LOD	*0.16 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
COD 17	< LOD	< LOD	*0.07 J*	< LOD	**0.14**	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
COD 18	< LOD	< LOD	*0.06 J*	< LOD	*0.07 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
COD 19	< LOD	< LOD	< LOD	< LOD	*0.15 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
COD 20	< LOD	< LOD	< LOD	< LOD	*0.11 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
FDR 21	< LOD	< LOD	**0.31**	*0.13 J*	**0.17**	< LOD	*0.07 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
FDR 22	< LOD	< LOD	**0.17**	*0.07 J*	*0.07 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
FDR 23	< LOD	< LOD	**0.36**	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
FDR 24	< LOD	< LOD	**0.38**	< LOD	*0.1 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
FDR 25	< LOD	< LOD	**0.14**	*0.06 J*	**0.14**	< LOD	*0.06 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
HAL 26	< LOD	< LOD	< LOD	< LOD	*0.1 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
HAL 27	< LOD	< LOD	*0.06 J*	< LOD	*0.09 J*	< LOD	< LOD	< LOD	< LOD	< LOD	*0.07 J*	< LOD	< LOD
HAL 28	< LOD	< LOD	*0.08 J*	< LOD	*0.1 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
HAL 29	< LOD	< LOD	< LOD	< LOD	*0.14 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
HAL 30	< LOD	< LOD	*0.06 J*	< LOD	**0.14**	< LOD	*0.1 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
RSP 31	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
RSP 32	< LOD	< LOD	*0.09 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
RSP 33	< LOD	< LOD	*0.1 J*	< LOD	*0.12 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
RSP 34	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
RSP 35	< LOD	< LOD	*0.12 J*	< LOD	*0.1 J*	< LOD	< LOD	< LOD	< LOD	< LOD	*0.07 J*	< LOD	< LOD
POL 36	< LOD	< LOD	< LOD	< LOD	*0.07 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
POL 37	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
POL 38	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
POL 39	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
POL 40	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
CHK 41	< LOD	< LOD	< LOD	< LOD	*0.09 J*	< LOD	*0.08 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
CHK 42	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
CHK 43	< LOD	< LOD	< LOD	< LOD	*0.11 J*	< LOD	*0.11 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
CHK 44	< LOD	< LOD	< LOD	< LOD	*0.09 J*	< LOD	*0.07 J*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
CHK 45	< LOD	< LOD	< LOD	< LOD	**0.14**	< LOD	*0.07 J*	< LOD	< LOD	< LOD	*0.05 J*	< LOD	< LOD
TIL 46	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
TIL 47	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
TIL 48	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
TIL 49	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
TIL 50	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD

Conclusion

All PFOS concentrations were below DOH's PFOS screening value for the general population and the summation of PFAS exceeded this screening value in only one sample, CAT-11 discussed

above. Therefore, from this market analysis we conclude that PFAS exposure risk from these commercial fish is below our screening value for PFOS and that these are good alternative sources of dietary fish when consumption advisories recommend avoiding fish that are high in PFOS.

DOH encourages all Washingtonians to eat at least eight to twelve ounces of fish per week in accordance with The Dietary Guidelines for Americans (2020). People may eat more than this amount of fish weekly; however frequent consumers should consider taking steps to reduce exposure to contaminants in the fish that they eat. Some general guidance is as follows:

- Eat a variety of fish that are low in contaminants according to guidance provided by DOH (http://www.doh.wa.gov/fish/) and local health agencies.
- If consuming self-caught fish: consume younger, smaller fish (within legal limits). These fish typically contain lower levels of accumulative contaminants than older, larger fish.
- When cleaning fish, remove the skin, fat, and internal organs before cooking; this will help to reduce the amount of some contaminants.
- Grill, bake, or broil fish so that fat drips off while cooking. (advice is for fat stored contaminants like PCBs)
- Young children and small adults should eat proportionally smaller meal sizes (Table 3).

Table 3. Adjustment of fish meal size based on the body weight of the consumer.

Weight (lbs)	Mass (kg)	Meal Size (oz)	Meal Size (g)
19	9	1	28
39	18	2	57
58	26	3	85
77	35	4	113
96	44	5	142
116	53	6	170
135	61	7	199
154	70	8	227
173	79	9	255
193	88	10	284
212	96	11	312
231	105	12	340
250	113	13	369
270	123	14	397
289	131	15	425
308	140	16	454

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Appendix A

Table A1. Locations of fish purchases.

Store chain	Store ID number	Store Address
Albertson's	186	301 Marysville Mall #60, Marysville, WA 98270
Albertson's	197	4010 A St SE, Auburn, WA 98002
Fred Meyer	81	700 Sleater Kinney Rd SE, Lacey, WA 98503
Fred Meyer	79	6901 S 19th St, Tacoma, WA 98466
Fred Meyer	57	21045 Bothell Everett Hwy, Bothell, WA 98021
Fred Meyer	60	100 NW 85th St, Seattle, WA 98117
Grocery Outlet	232	6425 6th Ave, Tacoma, WA 98406
Grocery Outlet	203	1750 La Bounty Dr Unit 101, Ferndale, WA 98248
Grocery Outlet	208	9620-b, State Ave, Marysville, WA 98270
Grocery Outlet	215	15625 NE 8th St, Bellevue, WA 98008
Haggen	237	1815 Main St, Ferndale, WA 98248
Haggen	242	757 Haggen Dr, Burlington, WA 98233
Haggen	243	2601 E Division St, Mt Vernon, WA 98274
Haggen	249	1406 Lake Tapps Pkwy E, Auburn, WA 98092
Haggen	248	17641 Garden Way NE, Woodinville, WA 98072
Haggen	239	2900 Woburn St, Bellingham, WA 98226
Haggen	240	210 36th St, Bellingham, WA 98225
Haggen	241	1401 12th St, Bellingham, WA 98225
Haggen	242	757 Haggen Dr, Burlington, WA 98233
Haggen	185	26603 72nd Ave NW, Stanwood, WA 98292
Haggen	245	3711 88th St NE, Marysville, WA 98270
Haggen	246	8915 Market Pl NE, Lake Stevens, WA 98258
Haggen	247	1301 Ave D, Snohomish, WA 98290
Haggen	248	17641 Garden Way NE, Woodinville, WA 98072

QFC	8	22833 Bothell Everett Hwy, Bothell, WA 98021
QFC	41	17847 1st Ave S, Normandy Park, WA 98148
QFC	29	1401 Broadway, Seattle, WA 98122
QFC	24	1801 N 45th St, Seattle, WA 98103
QFC	25	2746 NE 45th St, Seattle, WA 98105
QFC	17	600 NW Richmond Beach Rd, Shoreline, WA 98177
QFC	9	18921 Bothell Way NE, Bothell, WA 98011
QFC	16	3550 Factoria Blvd SE, Bellevue, WA 98006
QFC	35	8421 SE 68th St, Mercer Island, WA 98040
QFC	1	27008 92nd Ave NW, Stanwood, WA 98292
QFC	4	11700 Mukilteo Speedway, Mukilteo, WA 98275
QFC	17	600 NW Richmond Beach Rd, Shoreline, WA 98177
QFC	18	1531 NE 145th St, Seattle, WA 98155
QFC	25	2746 NE 45th St, Seattle, WA 98105
QFC	24	1801 N 45th St, Seattle, WA 98103
QFC	21	5700 24th Ave NW, Seattle, WA 98107
QFC	7	22803 44th Ave W, Mountlake Terrace, WA 98043
Safeway	175	3842 Bridgeport Way W, Tacoma, WA 98466
Safeway	176	10223 Gravelly Lake Dr SW, Lakewood, WA 98499
Safeway	104	4128 Rucker Ave, Everett, WA 98203
Safeway	106	7601 Evergreen Way, Everett, WA 98203
Safeway	105	1119 13th St, Snohomish, WA 98290
Safeway	109	16304 Bothell Everett Hwy, Mill Creek, WA 98012
Safeway	149	12725 1st Ave S, Burien, WA 98168
Safeway	146	2201 E Madison St, Seattle, WA 98112
Safeway	142	3020 NE 45th St, Seattle, WA 98105
Safeway	116	14444 124th Ave NE, Kirkland, WA 98034
Safeway	119	12519 NE 85th St, Kirkland, WA 98033
Safeway	131	17230 140th Ave SE, Renton, WA 98058

Safeway	97	911 11th St, Anacortes, WA 98221
Safeway	142	3020 NE 45th St, Seattle, WA 98105
Whole Foods	84	2800 196th St SW Ste 100, Lynnwood, WA 98036
Whole Foods	92	1001 Broadway, Seattle, WA 98122
Whole Foods	89	1026 NE 64th St, Seattle, WA 98115

Appendix B

DEPARTMENT OF ECOLOGY
Manchester Environmental Laboratory
7411 Beach Drive East ● Port Orchard, Washington 98366-8204

Case Narrative

May 16, 2022

To: Christie, Emerson

Project: DOH PFAS

Work Order: 2202036

Subject: Per- and polyfluoroalkyl substances by LCMSMS

From: Jerod Romine

Sample Receipt

Enclosed are the PFAS results for the samples received by MEL on February 15, 2022. All samples were received in acceptable condition unless noted in Analyst Comments. All samples were prepared and analyzed within holding times unless noted in Analyst Comments.

Analytical Methods

These samples were prepared, analyzed, and verified by MEL according to the submitted chain-of-custody and MEL's procedures. A Sample Correlation Table with batch summary is located in Appendix A. The samples were:

- extracted following a modification of method AOAC2007.01-P.
- analyzed following a modification of method SW8327.

Analyst Comments

PFAS by LCMSMS:

The reporting limit was lowered from the requested 0.5 ng/mL to between 0.1 - 0.2 ng/mL for all samples due to improvements in the extraction procedure. Client approved the reporting of detections below the reporting limit; therefore, all detections at up to one-half the LLOQ were reported and qualified as estimated values.

Sample Qualification

The samples were qualified according to MEL's procedures. The table in Appendix B summarizes the manual qualifiers added by MEL. All results reported below the method reporting limit (RL) were automatically qualified as estimates, but not included in Appendix B. The qualifiers are defined in Appendix C.

Sample Verification

All analyses met QC acceptance criteria except as noted in Appendix D. All analytes met linearity requirements unless noted in Appendix E.

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — Field ID: LTN-01

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.482 g
Final Vol: 2 mL

Lab ID #: 2202036-01
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.13	U	0.13
375-73-5	Perfluorobutanesulfonic acid	0.13	U	0.13
335-76-2	Perfluorodecanoic acid	0.13	U	0.13
307-55-1	Perfluorododecanoic acid	0.13	U	0.13
355-46-4	Perfluorohexanesulfonic acid	0.13	U	0.13
307-24-4	Perfluorohexanoic acid	0.13	U	0.13
375-95-1	Perfluorononanoic acid	0.13	U	0.13
754-91-6	Perfluorooctanesulfonamide	0.13	U	0.13
1763-23-1	**Perfluorooctanesulfonic acid**	**0.07**	**J**	**0.13**
335-67-1	Perfluorooctanoic acid	0.13	U	0.13
376-06-7	Perfluorotetradecanoic acid	0.13	U	0.13
72629-94-8	Perfluorotridecanoic acid	0.13	U	0.13
2058-94-8	**Perfluoroundecanoic acid**	**0.09**	**J**	**0.13**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.38	6.42	115	20-200
NULL	M2PFDoA	7.87	6.75	117	20-200
NULL	M2PFTeDA	5.53	6.75	82	20-200
NULL	M3PFBS	7.40	6.29	118	20-200
NULL	M3PFHxS	7.92	6.40	124	20-200
NULL	M5PFHxA	7.70	6.75	114	20-200
NULL	M6PFDA	7.32	6.75	108	20-200
NULL	M7PFUnA	7.44	6.75	110	20-200
NULL	M8FOSA	7.11	6.75	105	20-200
NULL	M8PFOA	7.03	6.75	104	20-200
NULL	M8PFOS	7.61	6.46	118	20-200
NULL	M9PFNA	7.07	6.75	105	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — Field ID: LTN-02

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.409 g
Final Vol: 2 mL

Lab ID #: 2202036-02
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.14	U	0.14
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	Perfluorodecanoic acid	0.14	U	0.14
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	Perfluorononanoic acid	0.14	U	0.14
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	**Perfluorotridecanoic acid**	**0.29**		**0.14**
2058-94-8	**Perfluoroundecanoic acid**	**0.23**		**0.14**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.04	6.75	104	20-200
NULL	M2PFDoA	7.63	7.10	108	20-200
NULL	M2PFTeDA	5.66	7.10	80	20-200
NULL	M3PFBS	7.48	6.61	113	20-200
NULL	M3PFHxS	7.90	6.73	117	20-200
NULL	M5PFHxA	7.24	7.10	102	20-200
NULL	M6PFDA	7.83	7.10	110	20-200
NULL	M7PFUnA	7.36	7.10	104	20-200
NULL	M8FOSA	6.96	7.10	98	20-200
NULL	M8PFOA	7.47	7.10	105	20-200
NULL	M8PFOS	7.29	6.80	107	20-200
NULL	M9PFNA	7.37	7.10	104	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — Field ID: LTN-03

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.867 g
Final Vol: 2 mL

Lab ID #: 2202036-03
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.11	U	0.11
375-73-5	Perfluorobutanesulfonic acid	0.11	U	0.11
335-76-2	Perfluorodecanoic acid	0.11	U	0.11
307-55-1	Perfluorododecanoic acid	0.11	U	0.11
355-46-4	Perfluorohexanesulfonic acid	0.11	U	0.11
307-24-4	Perfluorohexanoic acid	0.11	U	0.11
375-95-1	Perfluorononanoic acid	0.11	U	0.11
754-91-6	Perfluorooctanesulfonamide	0.11	U	0.11
1763-23-1	Perfluorooctanesulfonic acid	0.11	U	0.11
335-67-1	Perfluorooctanoic acid	0.11	U	0.11
376-06-7	Perfluorotetradecanoic acid	0.11	U	0.11
72629-94-8	Perfluorotridecanoic acid	0.11	U	0.11
2058-94-8	**Perfluoroundecanoic acid**	**0.08**	**J**	**0.11**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	5.69	5.09	112	20-200
NULL	M2PFDoA	5.90	5.36	110	20-200
NULL	M2PFTeDA	5.02	5.36	94	20-200
NULL	M3PFBS	5.83	4.99	117	20-200
NULL	M3PFHxS	6.11	5.08	120	20-200
NULL	M5PFHxA	6.06	5.36	113	20-200
NULL	M6PFDA	5.95	5.36	111	20-200
NULL	M7PFUnA	5.90	5.36	110	20-200
NULL	M8FOSA	5.79	5.36	108	20-200
NULL	M8PFOA	5.65	5.36	106	20-200
NULL	M8PFOS	5.93	5.13	116	20-200
NULL	M9PFNA	5.76	5.36	107	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
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Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — Field ID: LTN-04

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.432 g
Final Vol: 2 mL

Lab ID #: 2202036-04
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.14	U	0.14
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	Perfluorodecanoic acid	0.14	U	0.14
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	Perfluorononanoic acid	0.14	U	0.14
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	Perfluorotridecanoic acid	0.14	U	0.14
2058-94-8	**Perfluoroundecanoic acid**	**0.08**	**J**	**0.14**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.42	6.64	112	20-200
NULL	M2PFDoA	8.28	6.98	119	20-200
NULL	M2PFTeDA	5.61	6.98	80	20-200
NULL	M3PFBS	7.82	6.51	120	20-200
NULL	M3PFHxS	8.15	6.62	123	20-200
NULL	M5PFHxA	7.55	6.98	108	20-200
NULL	M6PFDA	7.51	6.98	107	20-200
NULL	M7PFUnA	7.92	6.98	113	20-200
NULL	M8FOSA	7.31	6.98	105	20-200
NULL	M8PFOA	7.41	6.98	106	20-200
NULL	M8PFOS	7.89	6.69	118	20-200
NULL	M9PFNA	7.71	6.98	110	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
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Project: DOH PFAS — Field ID: LTN-05

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.263 g
Final Vol: 2 mL

Lab ID #: 2202036-05
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.16	U	0.16
375-73-5	Perfluorobutanesulfonic acid	0.16	U	0.16
335-76-2	Perfluorodecanoic acid	0.16	U	0.16
307-55-1	Perfluorododecanoic acid	0.16	U	0.16
355-46-4	Perfluorohexanesulfonic acid	0.16	U	0.16
307-24-4	Perfluorohexanoic acid	0.16	U	0.16
375-95-1	Perfluorononanoic acid	0.16	U	0.16
754-91-6	Perfluorooctanesulfonamide	0.16	U	0.16
1763-23-1	Perfluorooctanesulfonic acid	0.16	U	0.16
335-67-1	Perfluorooctanoic acid	0.16	U	0.16
376-06-7	Perfluorotetradecanoic acid	0.16	U	0.16
72629-94-8	Perfluorotridecanoic acid	0.16	U	0.16
2058-94-8	Perfluoroundecanoic acid	0.16	U	0.16

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	8.03	7.53	107	20-200
NULL	M2PFDoA	8.45	7.92	107	20-200
NULL	M2PFTeDA	7.17	7.92	91	20-200
NULL	M3PFBS	8.40	7.38	114	20-200
NULL	M3PFHxS	8.58	7.51	114	20-200
NULL	M5PFHxA	8.19	7.92	103	20-200
NULL	M6PFDA	8.47	7.92	107	20-200
NULL	M7PFUnA	8.66	7.92	109	20-200
NULL	M8FOSA	8.19	7.92	103	20-200
NULL	M8PFOA	7.86	7.92	99	20-200
NULL	M8PFOS	8.47	7.59	112	20-200
NULL	M9PFNA	8.68	7.92	110	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — Field ID: WTN-06

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.537 g
Final Vol: 2 mL

Lab ID #: 2202036-06
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.13	U	0.13
375-73-5	Perfluorobutanesulfonic acid	0.13	U	0.13
335-76-2	Perfluorodecanoic acid	0.13	U	0.13
307-55-1	Perfluorododecanoic acid	0.13	U	0.13
355-46-4	Perfluorohexanesulfonic acid	0.13	U	0.13
307-24-4	Perfluorohexanoic acid	0.13	U	0.13
375-95-1	Perfluorononanoic acid	0.13	U	0.13
754-91-6	Perfluorooctanesulfonamide	0.13	U	0.13
1763-23-1	**Perfluorooctanesulfonic acid**	**0.07**	**J**	**0.13**
335-67-1	Perfluorooctanoic acid	0.13	U	0.13
376-06-7	Perfluorotetradecanoic acid	0.13	U	0.13
72629-94-8	Perfluorotridecanoic acid	0.13	U	0.13
2058-94-8	**Perfluoroundecanoic acid**	**0.08**	**J**	**0.13**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	6.75	6.19	109	20-200
NULL	M2PFDoA	7.72	6.51	119	20-200
NULL	M2PFTeDA	6.80	6.51	104	20-200
NULL	M3PFBS	7.30	6.06	120	20-200
NULL	M3PFHxS	7.80	6.17	126	20-200
NULL	M5PFHxA	7.24	6.51	111	20-200
NULL	M6PFDA	7.45	6.51	115	20-200
NULL	M7PFUnA	7.18	6.51	110	20-200
NULL	M8FOSA	6.94	6.51	107	20-200
NULL	M8PFOA	7.27	6.51	112	20-200
NULL	M8PFOS	7.29	6.23	117	20-200
NULL	M9PFNA	7.06	6.51	108	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — Field ID: WTN-07

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.546 g
Final Vol: 2 mL

Lab ID #: 2202036-07
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.13	U	0.13
375-73-5	Perfluorobutanesulfonic acid	0.13	U	0.13
335-76-2	Perfluorodecanoic acid	0.13	U	0.13
307-55-1	Perfluorododecanoic acid	0.13	U	0.13
355-46-4	Perfluorohexanesulfonic acid	0.13	U	0.13
307-24-4	Perfluorohexanoic acid	0.13	U	0.13
375-95-1	Perfluorononanoic acid	0.13	U	0.13
754-91-6	Perfluorooctanesulfonamide	0.13	U	0.13
1763-23-1	**Perfluorooctanesulfonic acid**	**0.11**	**J**	**0.13**
335-67-1	Perfluorooctanoic acid	0.13	U	0.13
376-06-7	Perfluorotetradecanoic acid	0.13	U	0.13
72629-94-8	**Perfluorotridecanoic acid**	**0.25**		**0.13**
2058-94-8	**Perfluoroundecanoic acid**	**0.36**		**0.13**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.06	6.15	115	20-200
NULL	M2PFDoA	7.26	6.47	112	20-200
NULL	M2PFTeDA	5.60	6.47	87	20-200
NULL	M3PFBS	7.77	6.03	129	20-200
NULL	M3PFHxS	7.88	6.13	129	20-200
NULL	M5PFHxA	7.22	6.47	112	20-200
NULL	M6PFDA	7.17	6.47	111	20-200
NULL	M7PFUnA	7.21	6.47	112	20-200
NULL	M8FOSA	6.96	6.47	108	20-200
NULL	M8PFOA	7.02	6.47	109	20-200
NULL	M8PFOS	7.37	6.20	119	20-200
NULL	M9PFNA	7.22	6.47	112	20-200

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Project: DOH PFAS — Field ID: WTN-08

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.604 g
Final Vol: 2 mL

Lab ID #: 2202036-08
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.12	U	0.12
375-73-5	Perfluorobutanesulfonic acid	0.12	U	0.12
335-76-2	**Perfluorodecanoic acid**	**0.07**	**J**	**0.12**
307-55-1	**Perfluorododecanoic acid**	**0.07**	**J**	**0.12**
355-46-4	Perfluorohexanesulfonic acid	0.12	U	0.12
307-24-4	Perfluorohexanoic acid	0.12	U	0.12
375-95-1	Perfluorononanoic acid	0.12	U	0.12
754-91-6	Perfluorooctanesulfonamide	0.12	U	0.12
1763-23-1	**Perfluorooctanesulfonic acid**	**0.20**		**0.12**
335-67-1	Perfluorooctanoic acid	0.12	U	0.12
376-06-7	**Perfluorotetradecanoic acid**	**0.07**	**J**	**0.12**
72629-94-8	**Perfluorotridecanoic acid**	**0.35**		**0.12**
2058-94-8	**Perfluoroundecanoic acid**	**0.24**		**0.12**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	6.37	5.93	108	20-200
NULL	M2PFDoA	6.30	6.23	101	20-200
NULL	M2PFTeDA	4.59	6.23	74	20-200
NULL	M3PFBS	6.71	5.81	115	20-200
NULL	M3PFHxS	6.92	5.91	117	20-200
NULL	M5PFHxA	6.12	6.23	98	20-200
NULL	M6PFDA	6.44	6.23	103	20-200
NULL	M7PFUnA	6.58	6.23	105	20-200
NULL	M8FOSA	6.29	6.23	101	20-200
NULL	M8PFOA	6.34	6.23	102	20-200
NULL	M8PFOS	6.49	5.97	109	20-200
NULL	M9PFNA	6.44	6.23	103	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: WTN-09

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.856 g
Final Vol: 2 mL

Lab ID #: 2202036-09
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.11	U	0.11
375-73-5	Perfluorobutanesulfonic acid	0.11	U	0.11
335-76-2	Perfluorodecanoic acid	0.11	U	0.11
307-55-1	Perfluorododecanoic acid	0.11	U	0.11
355-46-4	Perfluorohexanesulfonic acid	0.11	U	0.11
307-24-4	Perfluorohexanoic acid	0.11	U	0.11
375-95-1	Perfluorononanoic acid	0.11	U	0.11
754-91-6	**Perfluorooctanesulfonamide**	**0.08**	**J**	**0.11**
1763-23-1	**Perfluorooctanesulfonic acid**	**0.11**		**0.11**
335-67-1	Perfluorooctanoic acid	0.11	U	0.11
376-06-7	Perfluorotetradecanoic acid	0.11	U	0.11
72629-94-8	**Perfluorotridecanoic acid**	**0.07**	**J**	**0.11**
2058-94-8	**Perfluoroundecanoic acid**	**0.11**		**0.11**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	6.00	5.12	117	20-200
NULL	M2PFDoA	6.00	5.39	111	20-200
NULL	M2PFTeDA	5.00	5.39	93	20-200
NULL	M3PFBS	5.89	5.02	117	20-200
NULL	M3PFHxS	6.34	5.11	124	20-200
NULL	M5PFHxA	5.80	5.39	108	20-200
NULL	M6PFDA	5.83	5.39	108	20-200
NULL	M7PFUnA	5.73	5.39	106	20-200
NULL	M8FOSA	5.54	5.39	103	20-200
NULL	M8PFOA	5.71	5.39	106	20-200
NULL	M8PFOS	6.01	5.16	117	20-200
NULL	M9PFNA	5.67	5.39	105	20-200

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Project: DOH PFAS — Field ID: WTN-10

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.525 g
Final Vol: 2 mL

Lab ID #: 2202036-10
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.13	U	0.13
375-73-5	Perfluorobutanesulfonic acid	0.13	U	0.13
335-76-2	Perfluorodecanoic acid	0.13	U	0.13
307-55-1	Perfluorododecanoic acid	0.13	U	0.13
355-46-4	Perfluorohexanesulfonic acid	0.13	U	0.13
307-24-4	Perfluorohexanoic acid	0.13	U	0.13
375-95-1	Perfluorononanoic acid	0.13	U	0.13
754-91-6	Perfluorooctanesulfonamide	0.13	U	0.13
1763-23-1	**Perfluorooctanesulfonic acid**	**0.22**		**0.13**
335-67-1	Perfluorooctanoic acid	0.13	U	0.13
376-06-7	Perfluorotetradecanoic acid	0.13	U	0.13
72629-94-8	**Perfluorotridecanoic acid**	**0.24**		**0.13**
2058-94-8	**Perfluoroundecanoic acid**	**0.24**		**0.13**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	6.70	6.24	107	20-200
NULL	M2PFDoA	7.33	6.56	112	20-200
NULL	M2PFTeDA	7.19	6.56	110	20-200
NULL	M3PFBS	6.52	6.11	107	20-200
NULL	M3PFHxS	6.97	6.22	112	20-200
NULL	M5PFHxA	6.67	6.56	102	20-200
NULL	M6PFDA	7.16	6.56	109	20-200
NULL	M7PFUnA	7.46	6.56	114	20-200
NULL	M8FOSA	6.68	6.56	102	20-200
NULL	M8PFOA	6.79	6.56	104	20-200
NULL	M8PFOS	7.18	6.28	114	20-200
NULL	M9PFNA	6.87	6.56	105	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: CAT-11

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.476 g
Final Vol: 2 mL

Lab ID #: 2202036-11
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	**6:2 Fluorotelomer sulfonic acid**	**4.54**		**0.14**
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	Perfluorodecanoic acid	0.14	U	0.14
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	Perfluorononanoic acid	0.14	U	0.14
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	Perfluorotridecanoic acid	0.14	U	0.14
2058-94-8	Perfluoroundecanoic acid	0.14	U	0.14

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	8.40	6.44	130	20-200
NULL	M2PFDoA	7.68	6.78	113	20-200
NULL	M2PFTeDA	8.84	6.78	130	20-200
NULL	M3PFBS	7.11	6.31	113	20-200
NULL	M3PFHxS	7.57	6.42	118	20-200
NULL	M5PFHxA	7.08	6.78	104	20-200
NULL	M6PFDA	7.62	6.78	113	20-200
NULL	M7PFUnA	7.44	6.78	110	20-200
NULL	M8FOSA	7.41	6.78	109	20-200
NULL	M8PFOA	7.26	6.78	107	20-200
NULL	M8PFOS	7.54	6.49	116	20-200
NULL	M9PFNA	7.47	6.78	110	20-200

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Project: DOH PFAS — Field ID: CAT-12

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.39 g
Final Vol: 2 mL

Lab ID #: 2202036-12
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.14	U	0.14
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	Perfluorodecanoic acid	0.14	U	0.14
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	Perfluorononanoic acid	0.14	U	0.14
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	Perfluorotridecanoic acid	0.14	U	0.14
2058-94-8	Perfluoroundecanoic acid	0.14	U	0.14

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.82	6.84	114	20-200
NULL	M2PFDoA	8.12	7.19	113	20-200
NULL	M2PFTeDA	8.26	7.19	115	20-200
NULL	M3PFBS	7.51	6.71	112	20-200
NULL	M3PFHxS	8.22	6.82	120	20-200
NULL	M5PFHxA	7.72	7.19	107	20-200
NULL	M6PFDA	7.60	7.19	106	20-200
NULL	M7PFUnA	8.13	7.19	113	20-200
NULL	M8FOSA	8.04	7.19	112	20-200
NULL	M8PFOA	7.35	7.19	102	20-200
NULL	M8PFOS	7.77	6.89	113	20-200
NULL	M9PFNA	7.59	7.19	105	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: CAT-13

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.314 g
Final Vol: 2 mL

Lab ID #: 2202036-13
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.15	U	0.15
375-73-5	Perfluorobutanesulfonic acid	0.15	U	0.15
335-76-2	Perfluorodecanoic acid	0.15	U	0.15
307-55-1	Perfluorododecanoic acid	0.15	U	0.15
355-46-4	Perfluorohexanesulfonic acid	0.15	U	0.15
307-24-4	Perfluorohexanoic acid	0.15	U	0.15
375-95-1	Perfluorononanoic acid	0.15	U	0.15
754-91-6	Perfluorooctanesulfonamide	0.15	U	0.15
1763-23-1	Perfluorooctanesulfonic acid	0.15	U	0.15
335-67-1	Perfluorooctanoic acid	0.15	U	0.15
376-06-7	Perfluorotetradecanoic acid	0.15	U	0.15
72629-94-8	Perfluorotridecanoic acid	0.15	U	0.15
2058-94-8	Perfluoroundecanoic acid	0.15	U	0.15

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	8.35	7.24	115	20-200
NULL	M2PFDoA	8.86	7.61	116	20-200
NULL	M2PFTeDA	8.60	7.61	113	20-200
NULL	M3PFBS	8.26	7.09	116	20-200
NULL	M3PFHxS	9.06	7.21	126	20-200
NULL	M5PFHxA	8.71	7.61	114	20-200
NULL	M6PFDA	8.69	7.61	114	20-200
NULL	M7PFUnA	8.72	7.61	115	20-200
NULL	M8FOSA	8.22	7.61	108	20-200
NULL	M8PFOA	8.47	7.61	111	20-200
NULL	M8PFOS	8.57	7.29	118	20-200
NULL	M9PFNA	8.72	7.61	115	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: CAT-14

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.414 g
Final Vol: 2 mL

Lab ID #: 2202036-14
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.14	U	0.14
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	Perfluorodecanoic acid	0.14	U	0.14
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	Perfluorononanoic acid	0.14	U	0.14
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	Perfluorotridecanoic acid	0.14	U	0.14
2058-94-8	Perfluoroundecanoic acid	0.14	U	0.14

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	8.00	6.73	119	20-200
NULL	M2PFDoA	8.02	7.07	113	20-200
NULL	M2PFTeDA	8.03	7.07	114	20-200
NULL	M3PFBS	7.73	6.59	117	20-200
NULL	M3PFHxS	7.99	6.70	119	20-200
NULL	M5PFHxA	8.00	7.07	113	20-200
NULL	M6PFDA	7.89	7.07	112	20-200
NULL	M7PFUnA	8.00	7.07	113	20-200
NULL	M8FOSA	7.89	7.07	112	20-200
NULL	M8PFOA	7.93	7.07	112	20-200
NULL	M8PFOS	8.04	6.78	119	20-200
NULL	M9PFNA	7.69	7.07	109	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: CAT-15

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.624 g
Final Vol: 2 mL

Lab ID #: 2202036-15
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.12	U	0.12
375-73-5	Perfluorobutanesulfonic acid	0.12	U	0.12
335-76-2	Perfluorodecanoic acid	0.12	U	0.12
307-55-1	Perfluorododecanoic acid	0.12	U	0.12
355-46-4	Perfluorohexanesulfonic acid	0.12	U	0.12
307-24-4	Perfluorohexanoic acid	0.12	U	0.12
375-95-1	Perfluorononanoic acid	0.12	U	0.12
754-91-6	Perfluorooctanesulfonamide	0.12	U	0.12
1763-23-1	Perfluorooctanesulfonic acid	0.12	U	0.12
335-67-1	Perfluorooctanoic acid	0.12	U	0.12
376-06-7	Perfluorotetradecanoic acid	0.12	U	0.12
72629-94-8	Perfluorotridecanoic acid	0.12	U	0.12
2058-94-8	Perfluoroundecanoic acid	0.12	U	0.12

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.59	5.86	130	20-200
NULL	M2PFDoA	7.20	6.16	117	20-200
NULL	M2PFTeDA	8.26	6.16	134	20-200
NULL	M3PFBS	6.89	5.74	120	20-200
NULL	M3PFHxS	7.22	5.84	124	20-200
NULL	M5PFHxA	6.54	6.16	106	20-200
NULL	M6PFDA	7.01	6.16	114	20-200
NULL	M7PFUnA	7.87	6.16	128	20-200
NULL	M8FOSA	7.82	6.16	127	20-200
NULL	M8PFOA	6.88	6.16	112	20-200
NULL	M8PFOS	7.29	5.90	124	20-200
NULL	M9PFNA	7.24	6.16	118	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: COD-16

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.01 g
Final Vol: 2 mL

Lab ID #: 2202036-16
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.20	U	0.20
375-73-5	Perfluorobutanesulfonic acid	0.20	U	0.20
335-76-2	Perfluorodecanoic acid	0.20	U	0.20
307-55-1	Perfluorododecanoic acid	0.20	U	0.20
355-46-4	Perfluorohexanesulfonic acid	0.20	U	0.20
307-24-4	Perfluorohexanoic acid	0.20	U	0.20
375-95-1	**Perfluorononanoic acid**	**0.11**	**J**	**0.20**
754-91-6	Perfluorooctanesulfonamide	0.20	U	0.20
1763-23-1	Perfluorooctanesulfonic acid	0.20	U	0.20
335-67-1	Perfluorooctanoic acid	0.20	U	0.20
376-06-7	Perfluorotetradecanoic acid	0.20	U	0.20
72629-94-8	Perfluorotridecanoic acid	0.20	U	0.20
2058-94-8	**Perfluoroundecanoic acid**	**0.16**	**J**	**0.20**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	11.0	9.42	117	20-200
NULL	M2PFDoA	11.1	9.90	112	20-200
NULL	M2PFTeDA	10.9	9.90	110	20-200
NULL	M3PFBS	10.3	9.23	112	20-200
NULL	M3PFHxS	11.0	9.39	117	20-200
NULL	M5PFHxA	10.7	9.90	108	20-200
NULL	M6PFDA	11.3	9.90	115	20-200
NULL	M7PFUnA	10.4	9.90	105	20-200
NULL	M8FOSA	10.9	9.90	110	20-200
NULL	M8PFOA	10.4	9.90	105	20-200
NULL	M8PFOS	10.8	9.49	114	20-200
NULL	M9PFNA	10.8	9.90	109	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: COD-17

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.483 g
Final Vol: 2 mL

Lab ID #: 2202036-17
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.13	U	0.13
375-73-5	Perfluorobutanesulfonic acid	0.13	U	0.13
335-76-2	Perfluorodecanoic acid	0.13	U	0.13
307-55-1	Perfluorododecanoic acid	0.13	U	0.13
355-46-4	Perfluorohexanesulfonic acid	0.13	U	0.13
307-24-4	Perfluorohexanoic acid	0.13	U	0.13
375-95-1	**Perfluorononanoic acid**	**0.07**	**J**	**0.13**
754-91-6	Perfluorooctanesulfonamide	0.13	U	0.13
1763-23-1	Perfluorooctanesulfonic acid	0.13	U	0.13
335-67-1	Perfluorooctanoic acid	0.13	U	0.13
376-06-7	Perfluorotetradecanoic acid	0.13	U	0.13
72629-94-8	Perfluorotridecanoic acid	0.13	U	0.13
2058-94-8	**Perfluoroundecanoic acid**	**0.14**		**0.13**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	8.07	6.41	126	20-200
NULL	M2PFDoA	7.20	6.74	107	20-200
NULL	M2PFTeDA	8.48	6.74	126	20-200
NULL	M3PFBS	7.79	6.28	124	20-200
NULL	M3PFHxS	8.31	6.39	130	20-200
NULL	M5PFHxA	7.46	6.74	111	20-200
NULL	M6PFDA	7.45	6.74	111	20-200
NULL	M7PFUnA	7.19	6.74	107	20-200
NULL	M8FOSA	7.33	6.74	109	20-200
NULL	M8PFOA	7.43	6.74	110	20-200
NULL	M8PFOS	7.44	6.46	115	20-200
NULL	M9PFNA	7.18	6.74	107	20-200

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Project: DOH PFAS — Field ID: COD-18

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.758 g
Final Vol: 2 mL

Lab ID #: 2202036-18
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.11	U	0.11
375-73-5	Perfluorobutanesulfonic acid	0.11	U	0.11
335-76-2	Perfluorodecanoic acid	0.11	U	0.11
307-55-1	Perfluorododecanoic acid	0.11	U	0.11
355-46-4	Perfluorohexanesulfonic acid	0.11	U	0.11
307-24-4	Perfluorohexanoic acid	0.11	U	0.11
375-95-1	**Perfluorononanoic acid**	**0.06**	**J**	**0.11**
754-91-6	Perfluorooctanesulfonamide	0.11	U	0.11
1763-23-1	Perfluorooctanesulfonic acid	0.11	U	0.11
335-67-1	Perfluorooctanoic acid	0.11	U	0.11
376-06-7	Perfluorotetradecanoic acid	0.11	U	0.11
72629-94-8	Perfluorotridecanoic acid	0.11	U	0.11
2058-94-8	**Perfluoroundecanoic acid**	**0.07**	**J**	**0.11**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.16	5.41	132	20-200
NULL	M2PFDoA	5.63	5.69	99	20-200
NULL	M2PFTeDA	5.36	5.69	94	20-200
NULL	M3PFBS	6.27	5.30	118	20-200
NULL	M3PFHxS	6.65	5.39	123	20-200
NULL	M5PFHxA	6.24	5.69	110	20-200
NULL	M6PFDA	6.37	5.69	112	20-200
NULL	M7PFUnA	6.72	5.69	118	20-200
NULL	M8FOSA	6.57	5.69	116	20-200
NULL	M8PFOA	6.28	5.69	110	20-200
NULL	M8PFOS	6.59	5.45	121	20-200
NULL	M9PFNA	6.13	5.69	108	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: COD-19

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.13 g
Final Vol: 2 mL

Lab ID #: 2202036-19
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.18	U	0.18
375-73-5	Perfluorobutanesulfonic acid	0.18	U	0.18
335-76-2	Perfluorodecanoic acid	0.18	U	0.18
307-55-1	Perfluorododecanoic acid	0.18	U	0.18
355-46-4	Perfluorohexanesulfonic acid	0.18	U	0.18
307-24-4	Perfluorohexanoic acid	0.18	U	0.18
375-95-1	Perfluorononanoic acid	0.18	U	0.18
754-91-6	Perfluorooctanesulfonamide	0.18	U	0.18
1763-23-1	Perfluorooctanesulfonic acid	0.18	U	0.18
335-67-1	Perfluorooctanoic acid	0.18	U	0.18
376-06-7	Perfluorotetradecanoic acid	0.18	U	0.18
72629-94-8	Perfluorotridecanoic acid	0.18	U	0.18
2058-94-8	**Perfluoroundecanoic acid**	**0.15**	**J**	**0.18**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	9.88	8.42	117	20-200
NULL	M2PFDoA	9.26	8.85	105	20-200
NULL	M2PFTeDA	9.13	8.85	103	20-200
NULL	M3PFBS	9.11	8.25	110	20-200
NULL	M3PFHxS	9.60	8.39	114	20-200
NULL	M5PFHxA	9.41	8.85	106	20-200
NULL	M6PFDA	10.3	8.85	116	20-200
NULL	M7PFUnA	9.99	8.85	113	20-200
NULL	M8FOSA	9.59	8.85	108	20-200
NULL	M8PFOA	9.29	8.85	105	20-200
NULL	M8PFOS	9.64	8.48	114	20-200
NULL	M9PFNA	9.59	8.85	108	20-200

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Project: DOH PFAS — Field ID: COD-20

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.454 g
Final Vol: 2 mL

Lab ID #: 2202036-20
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.14	U	0.14
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	Perfluorodecanoic acid	0.14	U	0.14
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	Perfluorononanoic acid	0.14	U	0.14
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	Perfluorotridecanoic acid	0.14	U	0.14
2058-94-8	**Perfluoroundecanoic acid**	**0.11**	**J**	**0.14**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.68	6.54	117	20-200
NULL	M2PFDoA	7.52	6.88	109	20-200
NULL	M2PFTeDA	7.57	6.88	110	20-200
NULL	M3PFBS	6.66	6.41	104	20-200
NULL	M3PFHxS	7.16	6.52	110	20-200
NULL	M5PFHxA	7.31	6.88	106	20-200
NULL	M6PFDA	7.67	6.88	112	20-200
NULL	M7PFUnA	7.45	6.88	108	20-200
NULL	M8FOSA	7.74	6.88	112	20-200
NULL	M8PFOA	7.72	6.88	112	20-200
NULL	M8PFOS	7.42	6.59	113	20-200
NULL	M9PFNA	7.34	6.88	107	20-200

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Project: DOH PFAS — Field ID: FDR-21

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.413 g
Final Vol: 2 mL

Lab ID #: 2202036-21
Collected: 7/21/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.14	U	0.14
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	**Perfluorodecanoic acid**	**0.13**	**J**	**0.14**
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	**Perfluorononanoic acid**	**0.31**		**0.14**
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	**Perfluorotridecanoic acid**	**0.07**	**J**	**0.14**
2058-94-8	**Perfluoroundecanoic acid**	**0.17**		**0.14**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	8.94	6.73	133	20-200
NULL	M2PFDoA	7.58	7.08	107	20-200
NULL	M2PFTeDA	8.78	7.08	124	20-200
NULL	M3PFBS	8.26	6.60	125	20-200
NULL	M3PFHxS	8.69	6.71	129	20-200
NULL	M5PFHxA	8.13	7.08	115	20-200
NULL	M6PFDA	7.80	7.08	110	20-200
NULL	M7PFUnA	7.31	7.08	103	20-200
NULL	M8FOSA	7.97	7.08	113	20-200
NULL	M8PFOA	7.81	7.08	110	20-200
NULL	M8PFOS	8.28	6.78	122	20-200
NULL	M9PFNA	8.09	7.08	114	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: FDR-22

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.411 g
Final Vol: 2 mL

Lab ID #: 2202036-22
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.14	U	0.14
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	**Perfluorodecanoic acid**	**0.07**	**J**	**0.14**
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	**Perfluorononanoic acid**	**0.17**		**0.14**
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	Perfluorotridecanoic acid	0.14	U	0.14
2058-94-8	**Perfluoroundecanoic acid**	**0.07**	**J**	**0.14**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.34	6.74	109	20-200
NULL	M2PFDoA	7.52	7.09	106	20-200
NULL	M2PFTeDA	7.30	7.09	103	20-200
NULL	M3PFBS	7.67	6.61	116	20-200
NULL	M3PFHxS	7.92	6.72	118	20-200
NULL	M5PFHxA	7.33	7.09	103	20-200
NULL	M6PFDA	7.54	7.09	106	20-200
NULL	M7PFUnA	7.45	7.09	105	20-200
NULL	M8FOSA	7.40	7.09	104	20-200
NULL	M8PFOA	7.34	7.09	104	20-200
NULL	M8PFOS	7.40	6.79	109	20-200
NULL	M9PFNA	7.80	7.09	110	20-200

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Project: DOH PFAS — Field ID: FDR-23

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.138 g
Final Vol: 2 mL

Lab ID #: 2202036-23
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.18	U	0.18
375-73-5	Perfluorobutanesulfonic acid	0.18	U	0.18
335-76-2	Perfluorodecanoic acid	0.18	U	0.18
307-55-1	Perfluorododecanoic acid	0.18	U	0.18
355-46-4	Perfluorohexanesulfonic acid	0.18	U	0.18
307-24-4	Perfluorohexanoic acid	0.18	U	0.18
375-95-1	**Perfluorononanoic acid**	**0.36**		**0.18**
754-91-6	Perfluorooctanesulfonamide	0.18	U	0.18
1763-23-1	Perfluorooctanesulfonic acid	0.18	U	0.18
335-67-1	Perfluorooctanoic acid	0.18	U	0.18
376-06-7	Perfluorotetradecanoic acid	0.18	U	0.18
72629-94-8	Perfluorotridecanoic acid	0.18	U	0.18
2058-94-8	Perfluoroundecanoic acid	0.18	U	0.18

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	10.2	8.36	122	20-200
NULL	M2PFDoA	9.55	8.79	109	20-200
NULL	M2PFTeDA	9.37	8.79	107	20-200
NULL	M3PFBS	9.91	8.19	121	20-200
NULL	M3PFHxS	10.2	8.33	122	20-200
NULL	M5PFHxA	9.57	8.79	109	20-200
NULL	M6PFDA	10.3	8.79	117	20-200
NULL	M7PFUnA	9.23	8.79	105	20-200
NULL	M8FOSA	9.35	8.79	106	20-200
NULL	M8PFOA	9.78	8.79	111	20-200
NULL	M8PFOS	9.68	8.42	115	20-200
NULL	M9PFNA	10.0	8.79	114	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: FDR-24

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.349 g
Final Vol: 2 mL

Lab ID #: 2202036-24
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.15	U	0.15
375-73-5	Perfluorobutanesulfonic acid	0.15	U	0.15
335-76-2	Perfluorodecanoic acid	0.15	U	0.15
307-55-1	Perfluorododecanoic acid	0.15	U	0.15
355-46-4	Perfluorohexanesulfonic acid	0.15	U	0.15
307-24-4	Perfluorohexanoic acid	0.15	U	0.15
375-95-1	**Perfluorononanoic acid**	**0.38**		**0.15**
754-91-6	Perfluorooctanesulfonamide	0.15	U	0.15
1763-23-1	Perfluorooctanesulfonic acid	0.15	U	0.15
335-67-1	Perfluorooctanoic acid	0.15	U	0.15
376-06-7	Perfluorotetradecanoic acid	0.15	U	0.15
72629-94-8	Perfluorotridecanoic acid	0.15	U	0.15
2058-94-8	**Perfluoroundecanoic acid**	**0.10**	**J**	**0.15**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	8.71	7.05	123	20-200
NULL	M2PFDoA	8.47	7.41	114	20-200
NULL	M2PFTeDA	8.30	7.41	112	20-200
NULL	M3PFBS	8.20	6.91	119	20-200
NULL	M3PFHxS	8.98	7.03	128	20-200
NULL	M5PFHxA	7.82	7.41	105	20-200
NULL	M6PFDA	8.78	7.41	118	20-200
NULL	M7PFUnA	8.37	7.41	113	20-200
NULL	M8FOSA	7.92	7.41	107	20-200
NULL	M8PFOA	8.01	7.41	108	20-200
NULL	M8PFOS	8.21	7.10	116	20-200
NULL	M9PFNA	8.24	7.41	111	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: FDR-25

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.681 g
Final Vol: 2 mL

Lab ID #: 2202036-25
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.12	U	0.12
375-73-5	Perfluorobutanesulfonic acid	0.12	U	0.12
335-76-2	**Perfluorodecanoic acid**	**0.06**	**J**	**0.12**
307-55-1	Perfluorododecanoic acid	0.12	U	0.12
355-46-4	Perfluorohexanesulfonic acid	0.12	U	0.12
307-24-4	Perfluorohexanoic acid	0.12	U	0.12
375-95-1	**Perfluorononanoic acid**	**0.14**		**0.12**
754-91-6	Perfluorooctanesulfonamide	0.12	U	0.12
1763-23-1	Perfluorooctanesulfonic acid	0.12	U	0.12
335-67-1	Perfluorooctanoic acid	0.12	U	0.12
376-06-7	Perfluorotetradecanoic acid	0.12	U	0.12
72629-94-8	**Perfluorotridecanoic acid**	**0.06**	**J**	**0.12**
2058-94-8	**Perfluoroundecanoic acid**	**0.14**		**0.12**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.59	5.66	134	20-200
NULL	M2PFDoA	6.54	5.95	110	20-200
NULL	M2PFTeDA	7.31	5.95	123	20-200
NULL	M3PFBS	6.77	5.54	122	20-200
NULL	M3PFHxS	7.06	5.64	125	20-200
NULL	M5PFHxA	6.80	5.95	114	20-200
NULL	M6PFDA	6.75	5.95	113	20-200
NULL	M7PFUnA	6.67	5.95	112	20-200
NULL	M8FOSA	6.86	5.95	115	20-200
NULL	M8PFOA	6.83	5.95	115	20-200
NULL	M8PFOS	6.91	5.70	121	20-200
NULL	M9PFNA	6.91	5.95	116	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: HAL-26

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.075 g
Final Vol: 2 mL

Lab ID #: 2202036-26
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.19	U	0.19
375-73-5	Perfluorobutanesulfonic acid	0.19	U	0.19
335-76-2	Perfluorodecanoic acid	0.19	U	0.19
307-55-1	Perfluorododecanoic acid	0.19	U	0.19
355-46-4	Perfluorohexanesulfonic acid	0.19	U	0.19
307-24-4	Perfluorohexanoic acid	0.19	U	0.19
375-95-1	Perfluorononanoic acid	0.19	U	0.19
754-91-6	Perfluorooctanesulfonamide	0.19	U	0.19
1763-23-1	Perfluorooctanesulfonic acid	0.19	U	0.19
335-67-1	Perfluorooctanoic acid	0.19	U	0.19
376-06-7	Perfluorotetradecanoic acid	0.19	U	0.19
72629-94-8	Perfluorotridecanoic acid	0.19	U	0.19
2058-94-8	**Perfluoroundecanoic acid**	**0.10**	**J**	**0.19**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	10.2	8.85	115	20-200
NULL	M2PFDoA	9.61	9.30	103	20-200
NULL	M2PFTeDA	8.70	9.30	93	20-200
NULL	M3PFBS	9.67	8.67	112	20-200
NULL	M3PFHxS	10.4	8.82	118	20-200
NULL	M5PFHxA	10.1	9.30	108	20-200
NULL	M6PFDA	10.1	9.30	109	20-200
NULL	M7PFUnA	9.07	9.30	98	20-200
NULL	M8FOSA	10.2	9.30	110	20-200
NULL	M8PFOA	9.88	9.30	106	20-200
NULL	M8PFOS	9.86	8.91	111	20-200
NULL	M9PFNA	10.2	9.30	110	20-200

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Project: DOH PFAS — Field ID: HAL-27

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.722 g
Final Vol: 2 mL

Lab ID #: 2202036-27
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.12	U	0.12
375-73-5	Perfluorobutanesulfonic acid	0.12	U	0.12
335-76-2	Perfluorodecanoic acid	0.12	U	0.12
307-55-1	Perfluorododecanoic acid	0.12	U	0.12
355-46-4	Perfluorohexanesulfonic acid	0.12	U	0.12
307-24-4	Perfluorohexanoic acid	0.12	U	0.12
375-95-1	**Perfluorononanoic acid**	**0.06**	**J**	**0.12**
754-91-6	Perfluorooctanesulfonamide	0.12	U	0.12
1763-23-1	**Perfluorooctanesulfonic acid**	**0.07**	**J**	**0.12**
335-67-1	Perfluorooctanoic acid	0.12	U	0.12
376-06-7	Perfluorotetradecanoic acid	0.12	U	0.12
72629-94-8	Perfluorotridecanoic acid	0.12	U	0.12
2058-94-8	**Perfluoroundecanoic acid**	**0.09**	**J**	**0.12**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	6.38	5.52	115	20-200
NULL	M2PFDoA	5.69	5.81	98	20-200
NULL	M2PFTeDA	6.14	5.81	106	20-200
NULL	M3PFBS	6.05	5.41	112	20-200
NULL	M3PFHxS	6.70	5.51	122	20-200
NULL	M5PFHxA	6.09	5.81	105	20-200
NULL	M6PFDA	6.48	5.81	112	20-200
NULL	M7PFUnA	6.87	5.81	118	20-200
NULL	M8FOSA	6.48	5.81	112	20-200
NULL	M8PFOA	6.57	5.81	113	20-200
NULL	M8PFOS	6.62	5.56	119	20-200
NULL	M9PFNA	6.26	5.81	108	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: HAL-28

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.468 g
Final Vol: 2 mL

Lab ID #: 2202036-28
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.14	U	0.14
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	Perfluorodecanoic acid	0.14	U	0.14
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	**Perfluorononanoic acid**	**0.08**	**J**	**0.14**
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	Perfluorotridecanoic acid	0.14	U	0.14
2058-94-8	**Perfluoroundecanoic acid**	**0.10**	**J**	**0.14**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.16	6.48	111	20-200
NULL	M2PFDoA	6.82	6.81	100	20-200
NULL	M2PFTeDA	8.04	6.81	118	20-200
NULL	M3PFBS	7.13	6.35	112	20-200
NULL	M3PFHxS	7.56	6.46	117	20-200
NULL	M5PFHxA	7.37	6.81	108	20-200
NULL	M6PFDA	7.01	6.81	103	20-200
NULL	M7PFUnA	7.34	6.81	108	20-200
NULL	M8FOSA	7.60	6.81	112	20-200
NULL	M8PFOA	7.32	6.81	107	20-200
NULL	M8PFOS	7.86	6.53	121	20-200
NULL	M9PFNA	7.63	6.81	112	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: HAL-29

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.225 g
Final Vol: 2 mL

Lab ID #: 2202036-29
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.16	U	0.16
375-73-5	Perfluorobutanesulfonic acid	0.16	U	0.16
335-76-2	Perfluorodecanoic acid	0.16	U	0.16
307-55-1	Perfluorododecanoic acid	0.16	U	0.16
355-46-4	Perfluorohexanesulfonic acid	0.16	U	0.16
307-24-4	Perfluorohexanoic acid	0.16	U	0.16
375-95-1	Perfluorononanoic acid	0.16	U	0.16
754-91-6	Perfluorooctanesulfonamide	0.16	U	0.16
1763-23-1	Perfluorooctanesulfonic acid	0.16	U	0.16
335-67-1	Perfluorooctanoic acid	0.16	U	0.16
376-06-7	Perfluorotetradecanoic acid	0.16	U	0.16
72629-94-8	Perfluorotridecanoic acid	0.16	U	0.16
2058-94-8	**Perfluoroundecanoic acid**	**0.14**	**J**	**0.16**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	8.40	7.76	108	20-200
NULL	M2PFDoA	8.05	8.16	99	20-200
NULL	M2PFTeDA	9.14	8.16	112	20-200
NULL	M3PFBS	8.49	7.61	112	20-200
NULL	M3PFHxS	9.22	7.74	119	20-200
NULL	M5PFHxA	8.59	8.16	105	20-200
NULL	M6PFDA	8.70	8.16	107	20-200
NULL	M7PFUnA	8.63	8.16	106	20-200
NULL	M8FOSA	8.71	8.16	107	20-200
NULL	M8PFOA	8.71	8.16	107	20-200
NULL	M8PFOS	8.81	7.82	113	20-200
NULL	M9PFNA	8.95	8.16	110	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: HAL-30

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.632 g
Final Vol: 2 mL

Lab ID #: 2202036-30
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.12	U	0.12
375-73-5	Perfluorobutanesulfonic acid	0.12	U	0.12
335-76-2	Perfluorodecanoic acid	0.12	U	0.12
307-55-1	Perfluorododecanoic acid	0.12	U	0.12
355-46-4	Perfluorohexanesulfonic acid	0.12	U	0.12
307-24-4	Perfluorohexanoic acid	0.12	U	0.12
375-95-1	**Perfluorononanoic acid**	**0.06**	**J**	**0.12**
754-91-6	Perfluorooctanesulfonamide	0.12	U	0.12
1763-23-1	Perfluorooctanesulfonic acid	0.12	U	0.12
335-67-1	Perfluorooctanoic acid	0.12	U	0.12
376-06-7	Perfluorotetradecanoic acid	0.12	U	0.12
72629-94-8	**Perfluorotridecanoic acid**	**0.10**	**J**	**0.12**
2058-94-8	**Perfluoroundecanoic acid**	**0.14**		**0.12**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	6.89	5.83	118	20-200
NULL	M2PFDoA	6.46	6.13	105	20-200
NULL	M2PFTeDA	7.10	6.13	116	20-200
NULL	M3PFBS	7.02	5.71	123	20-200
NULL	M3PFHxS	7.39	5.81	127	20-200
NULL	M5PFHxA	6.69	6.13	109	20-200
NULL	M6PFDA	6.78	6.13	111	20-200
NULL	M7PFUnA	6.78	6.13	111	20-200
NULL	M8FOSA	7.07	6.13	115	20-200
NULL	M8PFOA	6.87	6.13	112	20-200
NULL	M8PFOS	7.12	5.87	121	20-200
NULL	M9PFNA	6.77	6.13	110	20-200

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Project: DOH PFAS — Field ID: RSP-31

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.2 g
Final Vol: 2 mL

Lab ID #: 2202036-31
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.17	U	0.17
375-73-5	Perfluorobutanesulfonic acid	0.17	U	0.17
335-76-2	Perfluorodecanoic acid	0.17	U	0.17
307-55-1	Perfluorododecanoic acid	0.17	U	0.17
355-46-4	Perfluorohexanesulfonic acid	0.17	U	0.17
307-24-4	Perfluorohexanoic acid	0.17	U	0.17
375-95-1	Perfluorononanoic acid	0.17	U	0.17
754-91-6	Perfluorooctanesulfonamide	0.17	U	0.17
1763-23-1	Perfluorooctanesulfonic acid	0.17	U	0.17
335-67-1	Perfluorooctanoic acid	0.17	U	0.17
376-06-7	Perfluorotetradecanoic acid	0.17	U	0.17
72629-94-8	Perfluorotridecanoic acid	0.17	U	0.17
2058-94-8	Perfluoroundecanoic acid	0.17	U	0.17

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	11.2	7.93	141	20-200
NULL	M2PFDoA	7.37	8.33	88	20-200
NULL	M2PFTeDA	7.74	8.33	93	20-200
NULL	M3PFBS	8.47	7.77	109	20-200
NULL	M3PFHxS	9.36	7.90	118	20-200
NULL	M5PFHxA	8.87	8.33	106	20-200
NULL	M6PFDA	9.28	8.33	111	20-200
NULL	M7PFUnA	10.8	8.33	130	20-200
NULL	M8FOSA	10.9	8.33	131	20-200
NULL	M8PFOA	8.94	8.33	107	20-200
NULL	M8PFOS	9.67	7.98	121	20-200
NULL	M9PFNA	9.12	8.33	109	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: RSP-32

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.485 g
Final Vol: 2 mL

Lab ID #: 2202036-32
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/22/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.13	U	0.13
375-73-5	Perfluorobutanesulfonic acid	0.13	U	0.13
335-76-2	Perfluorodecanoic acid	0.13	U	0.13
307-55-1	Perfluorododecanoic acid	0.13	U	0.13
355-46-4	Perfluorohexanesulfonic acid	0.13	U	0.13
307-24-4	Perfluorohexanoic acid	0.13	U	0.13
375-95-1	**Perfluorononanoic acid**	**0.09**	**J**	**0.13**
754-91-6	Perfluorooctanesulfonamide	0.13	U	0.13
1763-23-1	Perfluorooctanesulfonic acid	0.13	U	0.13
335-67-1	Perfluorooctanoic acid	0.13	U	0.13
376-06-7	Perfluorotetradecanoic acid	0.13	U	0.13
72629-94-8	Perfluorotridecanoic acid	0.13	U	0.13
2058-94-8	Perfluoroundecanoic acid	0.13	U	0.13

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	10.2	6.40	160	20-200
NULL	M2PFDoA	5.93	6.73	88	20-200
NULL	M2PFTeDA	6.44	6.73	96	20-200
NULL	M3PFBS	7.73	6.28	123	20-200
NULL	M3PFHxS	8.30	6.38	130	20-200
NULL	M5PFHxA	7.18	6.73	107	20-200
NULL	M6PFDA	7.73	6.73	115	20-200
NULL	M7PFUnA	8.82	6.73	131	20-200
NULL	M8FOSA	8.90	6.73	132	20-200
NULL	M8PFOA	7.25	6.73	108	20-200
NULL	M8PFOS	7.63	6.45	118	20-200
NULL	M9PFNA	7.34	6.73	109	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: RSP-33

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.168 g
Final Vol: 2 mL

Lab ID #: 2202036-33
Collected: 7/21/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.17	U	0.17
375-73-5	Perfluorobutanesulfonic acid	0.17	U	0.17
335-76-2	Perfluorodecanoic acid	0.17	U	0.17
307-55-1	Perfluorododecanoic acid	0.17	U	0.17
355-46-4	Perfluorohexanesulfonic acid	0.17	U	0.17
307-24-4	Perfluorohexanoic acid	0.17	U	0.17
375-95-1	**Perfluorononanoic acid**	**0.10**	**J**	**0.17**
754-91-6	Perfluorooctanesulfonamide	0.17	U	0.17
1763-23-1	Perfluorooctanesulfonic acid	0.17	U	0.17
335-67-1	Perfluorooctanoic acid	0.17	U	0.17
376-06-7	Perfluorotetradecanoic acid	0.17	U	0.17
72629-94-8	Perfluorotridecanoic acid	0.17	U	0.17
2058-94-8	**Perfluoroundecanoic acid**	**0.12**	**J**	**0.17**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	12.6	8.14	154	20-200
NULL	M2PFDoA	7.28	8.56	85	20-200
NULL	M2PFTeDA	7.58	8.56	89	20-200
NULL	M3PFBS	8.98	7.98	113	20-200
NULL	M3PFHxS	10.0	8.12	124	20-200
NULL	M5PFHxA	9.09	8.56	106	20-200
NULL	M6PFDA	9.51	8.56	111	20-200
NULL	M7PFUnA	10.8	8.56	127	20-200
NULL	M8FOSA	10.8	8.56	126	20-200
NULL	M8PFOA	9.24	8.56	108	20-200
NULL	M8PFOS	9.57	8.20	117	20-200
NULL	M9PFNA	9.51	8.56	111	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: RSP-34

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.001 g
Final Vol: 2 mL

Lab ID #: 2202036-34
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.20	U	0.20
375-73-5	Perfluorobutanesulfonic acid	0.20	U	0.20
335-76-2	Perfluorodecanoic acid	0.20	U	0.20
307-55-1	Perfluorododecanoic acid	0.20	U	0.20
355-46-4	Perfluorohexanesulfonic acid	0.20	U	0.20
307-24-4	Perfluorohexanoic acid	0.20	U	0.20
375-95-1	Perfluorononanoic acid	0.20	U	0.20
754-91-6	Perfluorooctanesulfonamide	0.20	U	0.20
1763-23-1	Perfluorooctanesulfonic acid	0.20	U	0.20
335-67-1	Perfluorooctanoic acid	0.20	U	0.20
376-06-7	Perfluorotetradecanoic acid	0.20	U	0.20
72629-94-8	Perfluorotridecanoic acid	0.20	U	0.20
2058-94-8	Perfluoroundecanoic acid	0.20	U	0.20

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	12.3	9.50	130	20-200
NULL	M2PFDoA	8.62	9.99	86	20-200
NULL	M2PFTeDA	8.60	9.99	86	20-200
NULL	M3PFBS	10.6	9.31	113	20-200
NULL	M3PFHxS	11.3	9.47	120	20-200
NULL	M5PFHxA	10.2	9.99	102	20-200
NULL	M6PFDA	11.0	9.99	111	20-200
NULL	M7PFUnA	12.1	9.99	121	20-200
NULL	M8FOSA	11.9	9.99	119	20-200
NULL	M8PFOA	10.8	9.99	108	20-200
NULL	M8PFOS	11.2	9.57	118	20-200
NULL	M9PFNA	11.1	9.99	111	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — Field ID: RSP-35

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.639 g
Final Vol: 2 mL

Lab ID #: 2202036-35
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.12	U	0.12
375-73-5	Perfluorobutanesulfonic acid	0.12	U	0.12
335-76-2	Perfluorodecanoic acid	0.12	U	0.12
307-55-1	Perfluorododecanoic acid	0.12	U	0.12
355-46-4	Perfluorohexanesulfonic acid	0.12	U	0.12
307-24-4	Perfluorohexanoic acid	0.12	U	0.12
375-95-1	**Perfluorononanoic acid**	**0.12**	**J**	**0.12**
754-91-6	Perfluorooctanesulfonamide	0.12	U	0.12
1763-23-1	**Perfluorooctanesulfonic acid**	**0.07**	**J**	**0.12**
335-67-1	Perfluorooctanoic acid	0.12	U	0.12
376-06-7	Perfluorotetradecanoic acid	0.12	U	0.12
72629-94-8	Perfluorotridecanoic acid	0.12	U	0.12
2058-94-8	**Perfluoroundecanoic acid**	**0.10**	**J**	**0.12**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	8.23	5.80	142	20-200
NULL	M2PFDoA	5.34	6.10	88	20-200
NULL	M2PFTeDA	5.17	6.10	85	20-200
NULL	M3PFBS	5.98	5.69	105	20-200
NULL	M3PFHxS	6.40	5.78	111	20-200
NULL	M5PFHxA	6.12	6.10	100	20-200
NULL	M6PFDA	6.46	6.10	106	20-200
NULL	M7PFUnA	7.20	6.10	118	20-200
NULL	M8FOSA	7.08	6.10	116	20-200
NULL	M8PFOA	6.41	6.10	105	20-200
NULL	M8PFOS	6.49	5.85	111	20-200
NULL	M9PFNA	6.45	6.10	106	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: POL-36

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.647 g
Final Vol: 2 mL

Lab ID #: 2202036-36
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.12	U	0.12
375-73-5	Perfluorobutanesulfonic acid	0.12	U	0.12
335-76-2	Perfluorodecanoic acid	0.12	U	0.12
307-55-1	Perfluorododecanoic acid	0.12	U	0.12
355-46-4	Perfluorohexanesulfonic acid	0.12	U	0.12
307-24-4	Perfluorohexanoic acid	0.12	U	0.12
375-95-1	Perfluorononanoic acid	0.12	U	0.12
754-91-6	Perfluorooctanesulfonamide	0.12	U	0.12
1763-23-1	Perfluorooctanesulfonic acid	0.12	U	0.12
335-67-1	Perfluorooctanoic acid	0.12	U	0.12
376-06-7	Perfluorotetradecanoic acid	0.12	U	0.12
72629-94-8	Perfluorotridecanoic acid	0.12	U	0.12
2058-94-8	**Perfluoroundecanoic acid**	**0.07**	**J**	**0.12**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.85	5.77	136	20-200
NULL	M2PFDoA	3.49	6.07	57	20-200
NULL	M2PFTeDA	3.25	6.07	54	20-200
NULL	M3PFBS	6.48	5.66	114	20-200
NULL	M3PFHxS	6.94	5.76	121	20-200
NULL	M5PFHxA	6.20	6.07	102	20-200
NULL	M6PFDA	6.06	6.07	100	20-200
NULL	M7PFUnA	6.42	6.07	106	20-200
NULL	M8FOSA	8.14	6.07	134	20-200
NULL	M8PFOA	6.32	6.07	104	20-200
NULL	M8PFOS	6.57	5.82	113	20-200
NULL	M9PFNA	6.37	6.07	105	20-200

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Project: DOH PFAS — Field ID: POL-37

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.447 g
Final Vol: 2 mL

Lab ID #: 2202036-37
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.14	U	0.14
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	Perfluorodecanoic acid	0.14	U	0.14
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	Perfluorononanoic acid	0.14	U	0.14
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	Perfluorotridecanoic acid	0.14	U	0.14
2058-94-8	Perfluoroundecanoic acid	0.14	U	0.14

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	6.73	6.57	102	20-200
NULL	M2PFDoA	5.45	6.91	79	20-200
NULL	M2PFTeDA	4.37	6.91	63	20-200
NULL	M3PFBS	7.06	6.44	110	20-200
NULL	M3PFHxS	7.50	6.55	115	20-200
NULL	M5PFHxA	7.05	6.91	102	20-200
NULL	M6PFDA	6.18	6.91	89	20-200
NULL	M7PFUnA	6.12	6.91	89	20-200
NULL	M8FOSA	6.63	6.91	96	20-200
NULL	M8PFOA	7.06	6.91	102	20-200
NULL	M8PFOS	6.98	6.62	105	20-200
NULL	M9PFNA	6.72	6.91	97	20-200

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Project: DOH PFAS — Field ID: POL-38

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.898 g
Final Vol: 2 mL

Lab ID #: 2202036-38
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.11	U	0.11
375-73-5	Perfluorobutanesulfonic acid	0.11	U	0.11
335-76-2	Perfluorodecanoic acid	0.11	U	0.11
307-55-1	Perfluorododecanoic acid	0.11	U	0.11
355-46-4	Perfluorohexanesulfonic acid	0.11	U	0.11
307-24-4	Perfluorohexanoic acid	0.11	U	0.11
375-95-1	Perfluorononanoic acid	0.11	U	0.11
754-91-6	Perfluorooctanesulfonamide	0.11	U	0.11
1763-23-1	Perfluorooctanesulfonic acid	0.11	U	0.11
335-67-1	Perfluorooctanoic acid	0.11	U	0.11
376-06-7	Perfluorotetradecanoic acid	0.11	U	0.11
72629-94-8	Perfluorotridecanoic acid	0.11	U	0.11
2058-94-8	Perfluoroundecanoic acid	0.11	U	0.11

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	5.69	5.01	114	20-200
NULL	M2PFDoA	3.56	5.27	68	20-200
NULL	M2PFTeDA	2.98	5.27	57	20-200
NULL	M3PFBS	5.40	4.91	110	20-200
NULL	M3PFHxS	5.86	4.99	117	20-200
NULL	M5PFHxA	5.25	5.27	100	20-200
NULL	M6PFDA	5.02	5.27	95	20-200
NULL	M7PFUnA	4.90	5.27	93	20-200
NULL	M8FOSA	5.55	5.27	105	20-200
NULL	M8PFOA	5.32	5.27	101	20-200
NULL	M8PFOS	5.60	5.05	111	20-200
NULL	M9PFNA	5.56	5.27	105	20-200

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Project: DOH PFAS — Field ID: POL-39

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.465 g
Final Vol: 2 mL

Lab ID #: 2202036-39
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.14	U	0.14
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	Perfluorodecanoic acid	0.14	U	0.14
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	Perfluorononanoic acid	0.14	U	0.14
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	Perfluorotridecanoic acid	0.14	U	0.14
2058-94-8	Perfluoroundecanoic acid	0.14	U	0.14

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	6.95	6.49	107	20-200
NULL	M2PFDoA	5.81	6.83	85	20-200
NULL	M2PFTeDA	5.36	6.83	79	20-200
NULL	M3PFBS	7.43	6.36	117	20-200
NULL	M3PFHxS	7.71	6.47	119	20-200
NULL	M5PFHxA	7.53	6.83	110	20-200
NULL	M6PFDA	7.48	6.83	110	20-200
NULL	M7PFUnA	7.13	6.83	104	20-200
NULL	M8FOSA	7.26	6.83	106	20-200
NULL	M8PFOA	7.35	6.83	108	20-200
NULL	M8PFOS	7.67	6.54	117	20-200
NULL	M9PFNA	7.21	6.83	106	20-200

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Project: DOH PFAS — Field ID: POL-40

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.202 g
Final Vol: 2 mL

Lab ID #: 2202036-40
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.17	U	0.17
375-73-5	Perfluorobutanesulfonic acid	0.17	U	0.17
335-76-2	Perfluorodecanoic acid	0.17	U	0.17
307-55-1	Perfluorododecanoic acid	0.17	U	0.17
355-46-4	Perfluorohexanesulfonic acid	0.17	U	0.17
307-24-4	Perfluorohexanoic acid	0.17	U	0.17
375-95-1	Perfluorononanoic acid	0.17	U	0.17
754-91-6	Perfluorooctanesulfonamide	0.17	U	0.17
1763-23-1	Perfluorooctanesulfonic acid	0.17	U	0.17
335-67-1	Perfluorooctanoic acid	0.17	U	0.17
376-06-7	Perfluorotetradecanoic acid	0.17	U	0.17
72629-94-8	Perfluorotridecanoic acid	0.17	U	0.17
2058-94-8	Perfluoroundecanoic acid	0.17	U	0.17

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	9.39	7.91	119	20-200
NULL	M2PFDoA	5.66	8.32	68	20-200
NULL	M2PFTeDA	5.45	8.32	66	20-200
NULL	M3PFBS	9.10	7.75	117	20-200
NULL	M3PFHxS	9.72	7.89	123	20-200
NULL	M5PFHxA	8.71	8.32	105	20-200
NULL	M6PFDA	8.29	8.32	100	20-200
NULL	M7PFUnA	7.72	8.32	93	20-200
NULL	M8FOSA	9.06	8.32	109	20-200
NULL	M8PFOA	8.96	8.32	108	20-200
NULL	M8PFOS	8.82	7.97	111	20-200
NULL	M9PFNA	8.82	8.32	106	20-200

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Project: DOH PFAS — Field ID: CHK-41

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.393 g
Final Vol: 2 mL

Lab ID #: 2202036-41
Collected: 10/6/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.14	U	0.14
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	Perfluorodecanoic acid	0.14	U	0.14
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	Perfluorononanoic acid	0.14	U	0.14
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	**Perfluorotridecanoic acid**	**0.08**	**J**	**0.14**
2058-94-8	**Perfluoroundecanoic acid**	**0.09**	**J**	**0.14**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	12.3	6.83	181	20-200
NULL	M2PFDoA	5.83	7.18	81	20-200
NULL	M2PFTeDA	5.72	7.18	80	20-200
NULL	M3PFBS	6.89	6.69	103	20-200
NULL	M3PFHxS	7.70	6.81	113	20-200
NULL	M5PFHxA	7.14	7.18	99	20-200
NULL	M6PFDA	7.44	7.18	104	20-200
NULL	M7PFUnA	8.27	7.18	115	20-200
NULL	M8FOSA	9.11	7.18	127	20-200
NULL	M8PFOA	7.21	7.18	100	20-200
NULL	M8PFOS	7.50	6.88	109	20-200
NULL	M9PFNA	7.32	7.18	102	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: CHK-42

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.145 g
Final Vol: 2 mL

Lab ID #: 2202036-42
Collected: 10/6/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.17	U	0.17
375-73-5	Perfluorobutanesulfonic acid	0.17	U	0.17
335-76-2	Perfluorodecanoic acid	0.17	U	0.17
307-55-1	Perfluorododecanoic acid	0.17	U	0.17
355-46-4	Perfluorohexanesulfonic acid	0.17	U	0.17
307-24-4	Perfluorohexanoic acid	0.17	U	0.17
375-95-1	Perfluorononanoic acid	0.17	U	0.17
754-91-6	Perfluorooctanesulfonamide	0.17	U	0.17
1763-23-1	Perfluorooctanesulfonic acid	0.17	U	0.17
335-67-1	Perfluorooctanoic acid	0.17	U	0.17
376-06-7	Perfluorotetradecanoic acid	0.17	U	0.17
72629-94-8	Perfluorotridecanoic acid	0.17	U	0.17
2058-94-8	Perfluoroundecanoic acid	0.17	U	0.17

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	11.3	8.31	136	20-200
NULL	M2PFDoA	7.09	8.73	81	20-200
NULL	M2PFTeDA	8.13	8.73	93	20-200
NULL	M3PFBS	8.81	8.14	108	20-200
NULL	M3PFHxS	9.42	8.28	114	20-200
NULL	M5PFHxA	8.90	8.73	102	20-200
NULL	M6PFDA	8.70	8.73	100	20-200
NULL	M7PFUnA	9.51	8.73	109	20-200
NULL	M8FOSA	9.76	8.73	112	20-200
NULL	M8PFOA	8.57	8.73	98	20-200
NULL	M8PFOS	9.23	8.37	110	20-200
NULL	M9PFNA	9.11	8.73	104	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: CHK-43

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.417 g
Final Vol: 2 mL

Lab ID #: 2202036-43
Collected: 10/6/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/22/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.14	U	0.14
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	Perfluorodecanoic acid	0.14	U	0.14
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	Perfluorononanoic acid	0.14	U	0.14
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	**Perfluorotridecanoic acid**	**0.11**	**J**	**0.14**
2058-94-8	**Perfluoroundecanoic acid**	**0.11**	**J**	**0.14**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	8.86	6.71	132	20-200
NULL	M2PFDoA	5.97	7.06	85	20-200
NULL	M2PFTeDA	6.40	7.06	91	20-200
NULL	M3PFBS	7.45	6.58	113	20-200
NULL	M3PFHxS	7.98	6.69	119	20-200
NULL	M5PFHxA	7.35	7.06	104	20-200
NULL	M6PFDA	7.36	7.06	104	20-200
NULL	M7PFUnA	7.50	7.06	106	20-200
NULL	M8FOSA	8.29	7.06	118	20-200
NULL	M8PFOA	7.33	7.06	104	20-200
NULL	M8PFOS	7.77	6.76	115	20-200
NULL	M9PFNA	7.44	7.06	105	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: CHK-44

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.803 g
Final Vol: 2 mL

Lab ID #: 2202036-44
Collected: 10/6/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/22/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.11	U	0.11
375-73-5	Perfluorobutanesulfonic acid	0.11	U	0.11
335-76-2	Perfluorodecanoic acid	0.11	U	0.11
307-55-1	Perfluorododecanoic acid	0.11	U	0.11
355-46-4	Perfluorohexanesulfonic acid	0.11	U	0.11
307-24-4	Perfluorohexanoic acid	0.11	U	0.11
375-95-1	Perfluorononanoic acid	0.11	U	0.11
754-91-6	Perfluorooctanesulfonamide	0.11	U	0.11
1763-23-1	Perfluorooctanesulfonic acid	0.11	U	0.11
335-67-1	Perfluorooctanoic acid	0.11	U	0.11
376-06-7	Perfluorotetradecanoic acid	0.11	U	0.11
72629-94-8	**Perfluorotridecanoic acid**	**0.07**	**J**	**0.11**
2058-94-8	**Perfluoroundecanoic acid**	**0.09**	**J**	**0.11**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	6.98	5.27	132	20-200
NULL	M2PFDoA	5.41	5.55	98	20-200
NULL	M2PFTeDA	5.50	5.55	99	20-200
NULL	M3PFBS	5.99	5.17	116	20-200
NULL	M3PFHxS	6.21	5.26	118	20-200
NULL	M5PFHxA	5.71	5.55	103	20-200
NULL	M6PFDA	6.08	5.55	110	20-200
NULL	M7PFUnA	7.09	5.55	128	20-200
NULL	M8FOSA	6.79	5.55	122	20-200
NULL	M8PFOA	5.91	5.55	107	20-200
NULL	M8PFOS	6.04	5.31	114	20-200
NULL	M9PFNA	5.82	5.55	105	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: CHK-45

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.992 g
Final Vol: 2 mL

Lab ID #: 2202036-45
Collected: 10/6/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/22/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.10	U	0.10
375-73-5	Perfluorobutanesulfonic acid	0.10	U	0.10
335-76-2	Perfluorodecanoic acid	0.10	U	0.10
307-55-1	Perfluorododecanoic acid	0.10	U	0.10
355-46-4	Perfluorohexanesulfonic acid	0.10	U	0.10
307-24-4	Perfluorohexanoic acid	0.10	U	0.10
375-95-1	Perfluorononanoic acid	0.10	U	0.10
754-91-6	Perfluorooctanesulfonamide	0.10	U	0.10
1763-23-1	**Perfluorooctanesulfonic acid**	**0.05**	**J**	**0.10**
335-67-1	Perfluorooctanoic acid	0.10	U	0.10
376-06-7	Perfluorotetradecanoic acid	0.10	U	0.10
72629-94-8	**Perfluorotridecanoic acid**	**0.07**	**J**	**0.10**
2058-94-8	**Perfluoroundecanoic acid**	**0.14**		**0.10**

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.22	4.77	151	20-200
NULL	M2PFDoA	5.06	5.02	101	20-200
NULL	M2PFTeDA	5.91	5.02	118	20-200
NULL	M3PFBS	5.08	4.68	109	20-200
NULL	M3PFHxS	5.44	4.76	114	20-200
NULL	M5PFHxA	5.12	5.02	102	20-200
NULL	M6PFDA	5.37	5.02	107	20-200
NULL	M7PFUnA	6.66	5.02	133	20-200
NULL	M8FOSA	6.97	5.02	139	20-200
NULL	M8PFOA	4.95	5.02	99	20-200
NULL	M8PFOS	5.43	4.81	113	20-200
NULL	M9PFNA	5.23	5.02	104	20-200

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Project: DOH PFAS — Field ID: TIL-46

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.423 g
Final Vol: 2 mL

Lab ID #: 2202036-46
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/22/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.14	U	0.14
375-73-5	Perfluorobutanesulfonic acid	0.14	U	0.14
335-76-2	Perfluorodecanoic acid	0.14	U	0.14
307-55-1	Perfluorododecanoic acid	0.14	U	0.14
355-46-4	Perfluorohexanesulfonic acid	0.14	U	0.14
307-24-4	Perfluorohexanoic acid	0.14	U	0.14
375-95-1	Perfluorononanoic acid	0.14	U	0.14
754-91-6	Perfluorooctanesulfonamide	0.14	U	0.14
1763-23-1	Perfluorooctanesulfonic acid	0.14	U	0.14
335-67-1	Perfluorooctanoic acid	0.14	U	0.14
376-06-7	Perfluorotetradecanoic acid	0.14	U	0.14
72629-94-8	Perfluorotridecanoic acid	0.14	U	0.14
2058-94-8	Perfluoroundecanoic acid	0.14	U	0.14

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	5.53	6.68	83	20-200
NULL	M2PFDoA	6.48	7.03	92	20-200
NULL	M2PFTeDA	5.64	7.03	80	20-200
NULL	M3PFBS	6.37	6.55	97	20-200
NULL	M3PFHxS	6.71	6.66	101	20-200
NULL	M5PFHxA	6.16	7.03	88	20-200
NULL	M6PFDA	6.53	7.03	93	20-200
NULL	M7PFUnA	6.78	7.03	96	20-200
NULL	M8FOSA	6.17	7.03	88	20-200
NULL	M8PFOA	6.37	7.03	91	20-200
NULL	M8PFOS	6.76	6.73	100	20-200
NULL	M9PFNA	6.28	7.03	89	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
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Project: DOH PFAS — Field ID: TIL-47

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.556 g
Final Vol: 2 mL

Lab ID #: 2202036-47
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.13	U	0.13
375-73-5	Perfluorobutanesulfonic acid	0.13	U	0.13
335-76-2	Perfluorodecanoic acid	0.13	U	0.13
307-55-1	Perfluorododecanoic acid	0.13	U	0.13
355-46-4	Perfluorohexanesulfonic acid	0.13	U	0.13
307-24-4	Perfluorohexanoic acid	0.13	U	0.13
375-95-1	Perfluorononanoic acid	0.13	U	0.13
754-91-6	Perfluorooctanesulfonamide	0.13	U	0.13
1763-23-1	Perfluorooctanesulfonic acid	0.13	U	0.13
335-67-1	Perfluorooctanoic acid	0.13	U	0.13
376-06-7	Perfluorotetradecanoic acid	0.13	U	0.13
72629-94-8	Perfluorotridecanoic acid	0.13	U	0.13
2058-94-8	Perfluoroundecanoic acid	0.13	U	0.13

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	6.01	6.11	98	20-200
NULL	M2PFDoA	7.01	6.43	109	20-200
NULL	M2PFTeDA	5.83	6.43	91	20-200
NULL	M3PFBS	6.55	5.99	109	20-200
NULL	M3PFHxS	6.73	6.09	111	20-200
NULL	M5PFHxA	6.22	6.43	97	20-200
NULL	M6PFDA	6.87	6.43	107	20-200
NULL	M7PFUnA	6.31	6.43	98	20-200
NULL	M8FOSA	6.44	6.43	100	20-200
NULL	M8PFOA	6.56	6.43	102	20-200
NULL	M8PFOS	6.64	6.16	108	20-200
NULL	M9PFNA	7.01	6.43	109	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
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Project: DOH PFAS — Field ID: TIL-48

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.145 g
Final Vol: 2 mL

Lab ID #: 2202036-48
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.17	U	0.17
375-73-5	Perfluorobutanesulfonic acid	0.17	U	0.17
335-76-2	Perfluorodecanoic acid	0.17	U	0.17
307-55-1	Perfluorododecanoic acid	0.17	U	0.17
355-46-4	Perfluorohexanesulfonic acid	0.17	U	0.17
307-24-4	Perfluorohexanoic acid	0.17	U	0.17
375-95-1	Perfluorononanoic acid	0.17	U	0.17
754-91-6	Perfluorooctanesulfonamide	0.17	U	0.17
1763-23-1	Perfluorooctanesulfonic acid	0.17	U	0.17
335-67-1	Perfluorooctanoic acid	0.17	U	0.17
376-06-7	Perfluorotetradecanoic acid	0.17	U	0.17
72629-94-8	Perfluorotridecanoic acid	0.17	U	0.17
2058-94-8	Perfluoroundecanoic acid	0.17	U	0.17

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	9.24	8.31	111	20-200
NULL	M2PFDoA	9.71	8.73	111	20-200
NULL	M2PFTeDA	9.01	8.73	103	20-200
NULL	M3PFBS	9.24	8.14	114	20-200
NULL	M3PFHxS	9.55	8.28	115	20-200
NULL	M5PFHxA	9.35	8.73	107	20-200
NULL	M6PFDA	9.02	8.73	103	20-200
NULL	M7PFUnA	9.30	8.73	106	20-200
NULL	M8FOSA	9.20	8.73	105	20-200
NULL	M8PFOA	9.10	8.73	104	20-200
NULL	M8PFOS	9.28	8.37	111	20-200
NULL	M9PFNA	9.16	8.73	105	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: TIL-49

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.236 g
Final Vol: 2 mL

Lab ID #: 2202036-49
Collected: 7/19/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.16	U	0.16
375-73-5	Perfluorobutanesulfonic acid	0.16	U	0.16
335-76-2	Perfluorodecanoic acid	0.16	U	0.16
307-55-1	Perfluorododecanoic acid	0.16	U	0.16
355-46-4	Perfluorohexanesulfonic acid	0.16	U	0.16
307-24-4	Perfluorohexanoic acid	0.16	U	0.16
375-95-1	Perfluorononanoic acid	0.16	U	0.16
754-91-6	Perfluorooctanesulfonamide	0.16	U	0.16
1763-23-1	Perfluorooctanesulfonic acid	0.16	U	0.16
335-67-1	Perfluorooctanoic acid	0.16	U	0.16
376-06-7	Perfluorotetradecanoic acid	0.16	U	0.16
72629-94-8	Perfluorotridecanoic acid	0.16	U	0.16
2058-94-8	Perfluoroundecanoic acid	0.16	U	0.16

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	8.93	7.69	116	20-200
NULL	M2PFDoA	9.32	8.09	115	20-200
NULL	M2PFTeDA	8.73	8.09	108	20-200
NULL	M3PFBS	9.24	7.54	123	20-200
NULL	M3PFHxS	9.27	7.67	121	20-200
NULL	M5PFHxA	8.76	8.09	108	20-200
NULL	M6PFDA	8.68	8.09	107	20-200
NULL	M7PFUnA	8.69	8.09	107	20-200
NULL	M8FOSA	8.10	8.09	100	20-200
NULL	M8PFOA	8.44	8.09	104	20-200
NULL	M8PFOS	8.73	7.75	113	20-200
NULL	M9PFNA	9.10	8.09	112	20-200

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Project: DOH PFAS — Field ID: TIL-50

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.55 g
Final Vol: 2 mL

Lab ID #: 2202036-50
Collected: 7/20/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.13	U	0.13
375-73-5	Perfluorobutanesulfonic acid	0.13	U	0.13
335-76-2	Perfluorodecanoic acid	0.13	U	0.13
307-55-1	Perfluorododecanoic acid	0.13	U	0.13
355-46-4	Perfluorohexanesulfonic acid	0.13	U	0.13
307-24-4	Perfluorohexanoic acid	0.13	U	0.13
375-95-1	Perfluorononanoic acid	0.13	U	0.13
754-91-6	Perfluorooctanesulfonamide	0.13	U	0.13
1763-23-1	Perfluorooctanesulfonic acid	0.13	U	0.13
335-67-1	Perfluorooctanoic acid	0.13	U	0.13
376-06-7	Perfluorotetradecanoic acid	0.13	U	0.13
72629-94-8	Perfluorotridecanoic acid	0.13	U	0.13
2058-94-8	Perfluoroundecanoic acid	0.13	U	0.13

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.12	6.14	116	20-200
NULL	M2PFDoA	7.52	6.45	117	20-200
NULL	M2PFTeDA	7.22	6.45	112	20-200
NULL	M3PFBS	6.92	6.01	115	20-200
NULL	M3PFHxS	7.36	6.12	120	20-200
NULL	M5PFHxA	7.07	6.45	110	20-200
NULL	M6PFDA	7.32	6.45	114	20-200
NULL	M7PFUnA	7.25	6.45	112	20-200
NULL	M8FOSA	6.90	6.45	107	20-200
NULL	M8PFOA	7.11	6.45	110	20-200
NULL	M8PFOS	7.28	6.18	118	20-200
NULL	M9PFNA	7.39	6.45	115	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — Field ID: CAT-51

Work Order: 2202036
Project Officer: Christie, Emerson
Initial Vol: 1.629 g
Final Vol: 2 mL

Lab ID #: 2202036-51
Collected: 7/21/2021
Prep Method: AOAC2007.01-P
Analysis Method: SW8327

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.12	U	0.12
375-73-5	Perfluorobutanesulfonic acid	0.12	U	0.12
335-76-2	Perfluorodecanoic acid	0.12	U	0.12
307-55-1	Perfluorododecanoic acid	0.12	U	0.12
355-46-4	Perfluorohexanesulfonic acid	0.12	U	0.12
307-24-4	Perfluorohexanoic acid	0.12	U	0.12
375-95-1	Perfluorononanoic acid	0.12	U	0.12
754-91-6	Perfluorooctanesulfonamide	0.12	U	0.12
1763-23-1	Perfluorooctanesulfonic acid	0.12	U	0.12
335-67-1	Perfluorooctanoic acid	0.12	U	0.12
376-06-7	Perfluorotetradecanoic acid	0.12	U	0.12
72629-94-8	Perfluorotridecanoic acid	0.12	U	0.12
2058-94-8	Perfluoroundecanoic acid	0.12	U	0.12

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.04	5.84	121	20-200
NULL	M2PFDoA	7.49	6.14	122	20-200
NULL	M2PFTeDA	6.44	6.14	105	20-200
NULL	M3PFBS	6.91	5.72	121	20-200
NULL	M3PFHxS	7.29	5.82	125	20-200
NULL	M5PFHxA	6.83	6.14	111	20-200
NULL	M6PFDA	6.87	6.14	112	20-200
NULL	M7PFUnA	7.25	6.14	118	20-200
NULL	M8FOSA	6.77	6.14	110	20-200
NULL	M8PFOA	6.60	6.14	108	20-200
NULL	M8PFOS	6.87	5.88	117	20-200
NULL	M9PFNA	7.03	6.14	115	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — QC Type : Method Blank

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1 g
Final Vol: 2 mL

Lab ID #: B22D172-BLK1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D172-BLK1

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.20	U	0.20
375-73-5	Perfluorobutanesulfonic acid	0.20	U	0.20
335-76-2	Perfluorodecanoic acid	0.20	U	0.20
307-55-1	Perfluorododecanoic acid	0.20	U	0.20
355-46-4	Perfluorohexanesulfonic acid	0.20	U	0.20
307-24-4	Perfluorohexanoic acid	0.20	U	0.20
375-95-1	Perfluorononanoic acid	0.20	U	0.20
754-91-6	Perfluorooctanesulfonamide	0.20	U	0.20
1763-23-1	Perfluorooctanesulfonic acid	0.20	U	0.20
335-67-1	Perfluorooctanoic acid	0.20	U	0.20
376-06-7	Perfluorotetradecanoic acid	0.20	U	0.20
72629-94-8	Perfluorotridecanoic acid	0.20	U	0.20
2058-94-8	Perfluoroundecanoic acid	0.20	U	0.20

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	8.41	9.51	88	20-200
NULL	M2PFDoA	9.24	10.0	92	20-200
NULL	M2PFTeDA	4.40	10.0	44	20-200
NULL	M3PFBS	9.71	9.32	104	20-200
NULL	M3PFHxS	10.3	9.48	108	20-200
NULL	M5PFHxA	9.74	10.0	97	20-200
NULL	M6PFDA	9.76	10.0	98	20-200
NULL	M7PFUnA	9.30	10.0	93	20-200
NULL	M8FOSA	9.94	10.0	99	20-200
NULL	M8PFOA	10.3	10.0	103	20-200
NULL	M8PFOS	10.8	9.58	113	20-200
NULL	M9PFNA	10.1	10.0	101	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — QC Type : Method Blank

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1 g
Final Vol: 2 mL

Lab ID #: B22D173-BLK1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D173-BLK1

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.20	U	0.20
375-73-5	Perfluorobutanesulfonic acid	0.20	U	0.20
335-76-2	Perfluorodecanoic acid	0.20	U	0.20
307-55-1	Perfluorododecanoic acid	0.20	U	0.20
355-46-4	Perfluorohexanesulfonic acid	0.20	U	0.20
307-24-4	Perfluorohexanoic acid	0.20	U	0.20
375-95-1	Perfluorononanoic acid	0.20	U	0.20
754-91-6	Perfluorooctanesulfonamide	0.20	U	0.20
1763-23-1	**Perfluorooctanesulfonic acid**	**0.18**	**J**	**0.20**
335-67-1	Perfluorooctanoic acid	0.20	U	0.20
376-06-7	Perfluorotetradecanoic acid	0.20	U	0.20
72629-94-8	Perfluorotridecanoic acid	0.20	U	0.20
2058-94-8	Perfluoroundecanoic acid	0.20	U	0.20

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	9.28	9.51	98	20-200
NULL	M2PFDoA	10.3	10.0	103	20-200
NULL	M2PFTeDA	8.71	10.0	87	20-200
NULL	M3PFBS	10.4	9.32	112	20-200
NULL	M3PFHxS	10.7	9.48	113	20-200
NULL	M5PFHxA	10.2	10.0	102	20-200
NULL	M6PFDA	9.68	10.0	97	20-200
NULL	M7PFUnA	10.1	10.0	101	20-200
NULL	M8FOSA	10.3	10.0	103	20-200
NULL	M8PFOA	10.2	10.0	102	20-200
NULL	M8PFOS	10.6	9.58	111	20-200
NULL	M9PFNA	10.6	10.0	106	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — QC Type : Method Blank

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1 g
Final Vol: 2 mL

Lab ID #: B22D192-BLK1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D192-BLK1

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

CAS#	Analyte	Result	Qualifier	LLOQ
27619-97-2	6:2 Fluorotelomer sulfonic acid	0.20	U	0.20
375-73-5	Perfluorobutanesulfonic acid	0.20	U	0.20
335-76-2	Perfluorodecanoic acid	0.20	U	0.20
307-55-1	Perfluorododecanoic acid	0.20	U	0.20
355-46-4	Perfluorohexanesulfonic acid	0.20	U	0.20
307-24-4	Perfluorohexanoic acid	0.20	U	0.20
375-95-1	Perfluorononanoic acid	0.20	U	0.20
754-91-6	Perfluorooctanesulfonamide	0.20	U	0.20
1763-23-1	Perfluorooctanesulfonic acid	0.20	U	0.20
335-67-1	Perfluorooctanoic acid	0.20	U	0.20
376-06-7	Perfluorotetradecanoic acid	0.20	U	0.20
72629-94-8	Perfluorotridecanoic acid	0.20	U	0.20
2058-94-8	Perfluoroundecanoic acid	0.20	U	0.20

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	9.34	9.51	98	20-200
NULL	M2PFDoA	10.3	10.0	103	20-200
NULL	M2PFTeDA	8.74	10.0	87	20-200
NULL	M3PFBS	9.83	9.32	105	20-200
NULL	M3PFHxS	10.3	9.48	108	20-200
NULL	M5PFHxA	9.65	10.0	97	20-200
NULL	M6PFDA	10.2	10.0	102	20-200
NULL	M7PFUnA	9.39	10.0	94	20-200
NULL	M8FOSA	9.71	10.0	97	20-200
NULL	M8PFOA	10.0	10.0	100	20-200
NULL	M8PFOS	10.2	9.58	107	20-200
NULL	M9PFNA	9.86	10.0	99	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Project: DOH PFAS — QC Type : LCS

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1 g
Final Vol: 2 mL

Lab ID #: B22D172-BS1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D172-BS1

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: %

Analyte	Result	Spike Level	LLOQ	%Rec	%Rec Limits
6:2 Fluorotelomer sulfonic acid	19.7	19.0	0.20	104	50-150
Perfluorobutanesulfonic acid	17.1	17.7	0.20	97	50-150
Perfluorodecanoic acid	20.0	20.0	0.20	100	50-150
Perfluorododecanoic acid	19.6	20.0	0.20	98	50-150
Perfluorohexanesulfonic acid	16.9	18.3	0.20	93	50-150
Perfluorohexanoic acid	19.7	20.0	0.20	99	50-150
Perfluorononanoic acid	18.9	20.0	0.20	94	50-150
Perfluorooctanesulfonamide	19.3	20.0	0.20	97	50-150
Perfluorooctanesulfonic acid	17.6	18.6	0.20	95	50-150
Perfluorooctanoic acid	19.6	20.0	0.20	98	50-150
Perfluorotetradecanoic acid	18.8	20.0	0.20	94	50-150
Perfluorotridecanoic acid	20.8	20.0	0.20	104	50-150
Perfluoroundecanoic acid	19.9	20.0	0.20	100	50-150

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	9.29	9.51	98	20-200
NULL	M2PFDoA	9.02	10.0	90	20-200
NULL	M2PFTeDA	8.58	10.0	86	20-200
NULL	M3PFBS	9.41	9.32	101	20-200
NULL	M3PFHxS	10.3	9.48	108	20-200
NULL	M5PFHxA	9.39	10.0	94	20-200
NULL	M6PFDA	9.04	10.0	90	20-200
NULL	M7PFUnA	9.14	10.0	91	20-200
NULL	M8FOSA	9.73	10.0	97	20-200
NULL	M8PFOA	9.70	10.0	97	20-200
NULL	M8PFOS	9.73	9.58	102	20-200
NULL	M9PFNA	9.97	10.0	100	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — QC Type : LCS Dup

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1 g
Final Vol: 2 mL

Lab ID #: B22D172-BSD1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D172-BSD1

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/21/2022
Matrix: Tissue
Units: %

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
6:2 Fluorotelomer sulfonic acid	18.5	19.0	97	6	50-150	40
Perfluorobutanesulfonic acid	16.8	17.7	94	2	50-150	40
Perfluorodecanoic acid	18.2	20.0	91	9	50-150	40
Perfluorododecanoic acid	20.6	20.0	103	5	50-150	40
Perfluorohexanesulfonic acid	16.8	18.3	92	0.5	50-150	40
Perfluorohexanoic acid	19.7	20.0	98	0.4	50-150	40
Perfluorononanoic acid	18.8	20.0	94	0.3	50-150	40
Perfluorooctanesulfonamide	19.5	20.0	98	1	50-150	40
Perfluorooctanesulfonic acid	17.4	18.6	94	1	50-150	40
Perfluorooctanoic acid	19.2	20.0	96	2	50-150	40
Perfluorotetradecanoic acid	18.3	20.0	91	3	50-150	40
Perfluorotridecanoic acid	21.4	20.0	107	3	50-150	40
Perfluoroundecanoic acid	19.3	20.0	97	3	50-150	40

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	10.4	9.51	110	20-200
NULL	M2PFDoA	8.96	10.0	90	20-200
NULL	M2PFTeDA	9.41	10.0	94	20-200
NULL	M3PFBS	10.1	9.32	108	20-200
NULL	M3PFHxS	10.6	9.48	112	20-200
NULL	M5PFHxA	10.1	10.0	101	20-200
NULL	M6PFDA	10.4	10.0	104	20-200
NULL	M7PFUnA	10.1	10.0	101	20-200
NULL	M8FOSA	10.1	10.0	101	20-200
NULL	M8PFOA	10.3	10.0	103	20-200
NULL	M8PFOS	10.4	9.58	109	20-200
NULL	M9PFNA	10.2	10.0	102	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — QC Type : LCS

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1 g
Final Vol: 2 mL

Lab ID #: B22D173-BS1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D173-BS1

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: %

Analyte	Result	Spike Level	LLOQ	%Rec	%Rec Limits
6:2 Fluorotelomer sulfonic acid	20.5	19.0	0.20	108	50-150
Perfluorobutanesulfonic acid	18.8	17.7	0.20	106	50-150
Perfluorodecanoic acid	21.2	20.0	0.20	106	50-150
Perfluorododecanoic acid	22.9	20.0	0.20	114	50-150
Perfluorohexanesulfonic acid	19.5	18.3	0.20	107	50-150
Perfluorohexanoic acid	21.6	20.0	0.20	108	50-150
Perfluorononanoic acid	21.7	20.0	0.20	108	50-150
Perfluorooctanesulfonamide	22.8	20.0	0.20	114	50-150
Perfluorooctanesulfonic acid	19.8	18.6	0.20	107	50-150
Perfluorooctanoic acid	21.3	20.0	0.20	107	50-150
Perfluorotetradecanoic acid	21.8	20.0	0.20	109	50-150
Perfluorotridecanoic acid	22.8	20.0	0.20	114	50-150
Perfluoroundecanoic acid	23.6	20.0	0.20	118	50-150

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	10.5	9.51	111	20-200
NULL	M2PFDoA	10.9	10.0	109	20-200
NULL	M2PFTeDA	9.32	10.0	93	20-200
NULL	M3PFBS	9.84	9.32	106	20-200
NULL	M3PFHxS	10.7	9.48	112	20-200
NULL	M5PFHxA	10.6	10.0	106	20-200
NULL	M6PFDA	10.9	10.0	109	20-200
NULL	M7PFUnA	9.99	10.0	100	20-200
NULL	M8FOSA	9.76	10.0	98	20-200
NULL	M8PFOA	10.1	10.0	101	20-200
NULL	M8PFOS	10.4	9.58	108	20-200
NULL	M9PFNA	10.5	10.0	105	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — QC Type : LCS Dup

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1 g
Final Vol: 2 mL

Lab ID #: B22D173-BSD1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D173-BSD1

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: %

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
6:2 Fluorotelomer sulfonic acid	20.7	19.0	109	0.7	50-150	40
Perfluorobutanesulfonic acid	19.9	17.7	112	6	50-150	40
Perfluorodecanoic acid	22.7	20.0	113	7	50-150	40
Perfluorododecanoic acid	22.8	20.0	114	0.08	50-150	40
Perfluorohexanesulfonic acid	19.8	18.3	109	2	50-150	40
Perfluorohexanoic acid	22.5	20.0	112	4	50-150	40
Perfluorononanoic acid	22.0	20.0	110	1	50-150	40
Perfluorooctanesulfonamide	21.7	20.0	109	5	50-150	40
Perfluorooctanesulfonic acid	20.5	18.6	111	4	50-150	40
Perfluorooctanoic acid	22.3	20.0	112	5	50-150	40
Perfluorotetradecanoic acid	22.8	20.0	114	5	50-150	40
Perfluorotridecanoic acid	22.2	20.0	111	2	50-150	40
Perfluoroundecanoic acid	21.8	20.0	109	8	50-150	40

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	10.7	9.51	113	20-200
NULL	M2PFDoA	9.82	10.0	98	20-200
NULL	M2PFTeDA	9.50	10.0	95	20-200
NULL	M3PFBS	9.22	9.32	99	20-200
NULL	M3PFHxS	10.5	9.48	111	20-200
NULL	M5PFHxA	9.91	10.0	99	20-200
NULL	M6PFDA	10.1	10.0	101	20-200
NULL	M7PFUnA	10.1	10.0	101	20-200
NULL	M8FOSA	9.93	10.0	99	20-200
NULL	M8PFOA	9.75	10.0	98	20-200
NULL	M8PFOS	10.1	9.58	105	20-200
NULL	M9PFNA	9.72	10.0	97	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — QC Type : LCS

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1 g
Final Vol: 2 mL

Lab ID #: B22D192-BS1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D192-BS1

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: %

Analyte	Result	Spike Level	LLOQ	%Rec	%Rec Limits
6:2 Fluorotelomer sulfonic acid	21.8	19.0	0.20	115	50-150
Perfluorobutanesulfonic acid	18.3	17.7	0.20	103	50-150
Perfluorodecanoic acid	21.2	20.0	0.20	106	50-150
Perfluorododecanoic acid	21.8	20.0	0.20	109	50-150
Perfluorohexanesulfonic acid	18.8	18.3	0.20	103	50-150
Perfluorohexanoic acid	21.6	20.0	0.20	108	50-150
Perfluorononanoic acid	21.6	20.0	0.20	108	50-150
Perfluorooctanesulfonamide	21.8	20.0	0.20	109	50-150
Perfluorooctanesulfonic acid	20.1	18.6	0.20	109	50-150
Perfluorooctanoic acid	22.3	20.0	0.20	111	50-150
Perfluorotetradecanoic acid	22.7	20.0	0.20	114	50-150
Perfluorotridecanoic acid	23.1	20.0	0.20	115	50-150
Perfluoroundecanoic acid	23.7	20.0	0.20	118	50-150

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	10.0	9.51	106	20-200
NULL	M2PFDoA	9.83	10.0	98	20-200
NULL	M2PFTeDA	8.61	10.0	86	20-200
NULL	M3PFBS	9.71	9.32	104	20-200
NULL	M3PFHxS	10.8	9.48	114	20-200
NULL	M5PFHxA	10.0	10.0	100	20-200
NULL	M6PFDA	9.69	10.0	97	20-200
NULL	M7PFUnA	8.94	10.0	89	20-200
NULL	M8FOSA	9.75	10.0	98	20-200
NULL	M8PFOA	9.68	10.0	97	20-200
NULL	M8PFOS	10.1	9.58	106	20-200
NULL	M9PFNA	9.90	10.0	99	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — QC Type : LCS Dup

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1 g
Final Vol: 2 mL

Lab ID #: B22D192-BSD1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D192-BSD1

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: %

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
6:2 Fluorotelomer sulfonic acid	21.4	19.0	112	2	50-150	40
Perfluorobutanesulfonic acid	19.3	17.7	109	5	50-150	40
Perfluorodecanoic acid	22.4	20.0	112	6	50-150	40
Perfluorododecanoic acid	22.8	20.0	114	4	50-150	40
Perfluorohexanesulfonic acid	20.6	18.3	113	9	50-150	40
Perfluorohexanoic acid	22.5	20.0	113	4	50-150	40
Perfluorononanoic acid	23.3	20.0	116	7	50-150	40
Perfluorooctanesulfonamide	22.0	20.0	110	1	50-150	40
Perfluorooctanesulfonic acid	21.1	18.6	114	5	50-150	40
Perfluorooctanoic acid	22.6	20.0	113	1	50-150	40
Perfluorotetradecanoic acid	23.1	20.0	115	2	50-150	40
Perfluorotridecanoic acid	22.5	20.0	113	2	50-150	40
Perfluoroundecanoic acid	24.4	20.0	122	3	50-150	40

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	10.9	9.51	115	20-200
NULL	M2PFDoA	10.2	10.0	102	20-200
NULL	M2PFTeDA	9.42	10.0	94	20-200
NULL	M3PFBS	10.1	9.32	109	20-200
NULL	M3PFHxS	10.6	9.48	111	20-200
NULL	M5PFHxA	9.87	10.0	99	20-200
NULL	M6PFDA	9.81	10.0	98	20-200
NULL	M7PFUnA	9.13	10.0	91	20-200
NULL	M8FOSA	10.0	10.0	100	20-200
NULL	M8PFOA	9.91	10.0	99	20-200
NULL	M8PFOS	10.2	9.58	106	20-200
NULL	M9PFNA	10.3	10.0	103	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
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Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — QC Type : Matrix Spike

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1.367 g
Final Vol: 2 mL

Lab ID #: B22D172-MS1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D172-MS1
Source Lab ID #: 2202036-32

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/22/2022
Matrix: Tissue
Units: %

Analyte	Result	Spike Level	Source Result	%Rec	%Rec Limits
6:2 Fluorotelomer sulfonic acid	12.9	13.9	0.0	92	40-160
Perfluorobutanesulfonic acid	11.3	13.0	0.0	87	40-160
Perfluorodecanoic acid	12.7	14.6	0.0	87	40-160
Perfluorododecanoic acid	13.5	14.6	0.0	93	40-160
Perfluorohexanesulfonic acid	11.2	13.4	0.0	83	40-160
Perfluorohexanoic acid	13.0	14.6	0.0	89	40-160
Perfluorononanoic acid	12.5	14.6	0.09	85	40-160
Perfluorooctanesulfonamide	12.5	14.6	0.0	85	40-160
Perfluorooctanesulfonic acid	11.6	13.6	0.0	86	40-160
Perfluorooctanoic acid	12.9	14.6	0.0	88	40-160
Perfluorotetradecanoic acid	12.6	14.6	0.0	86	40-160
Perfluorotridecanoic acid	16.1	14.6	0.0	110	40-160
Perfluoroundecanoic acid	13.3	14.6	0.0	91	40-160

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	12.5	6.96	179	20-200
NULL	M2PFDoA	6.37	7.32	87	20-200
NULL	M2PFTeDA	7.33	7.32	100	20-200
NULL	M3PFBS	7.57	6.82	111	20-200
NULL	M3PFHxS	8.35	6.93	120	20-200
NULL	M5PFHxA	7.69	7.32	105	20-200
NULL	M6PFDA	8.18	7.32	112	20-200
NULL	M7PFUnA	9.55	7.32	131	20-200
NULL	M8FOSA	10.4	7.32	143	20-200
NULL	M8PFOA	8.11	7.32	111	20-200
NULL	M8PFOS	8.22	7.01	117	20-200
NULL	M9PFNA	8.09	7.32	111	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — QC Type : Matrix Spike Dup

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1.537 g
Final Vol: 2 mL

Lab ID #: B22D172-MSD1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D172-MSD1
Source Lab ID #: 2202036-32

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/22/2022
Matrix: Tissue
Units: %

Analyte	Sample Result	Spike Level	Source Result	%Rec	RPD	%Rec Limits	RPD Limit
6:2 Fluorotelomer sulfonic acid	11.5	12.4	0.0	93	11	40-160	40
Perfluorobutanesulfonic acid	10.9	11.5	0.0	95	4	40-160	40
Perfluorodecanoic acid	11.6	13.0	0.0	89	9	40-160	40
Perfluorododecanoic acid	12.9	13.0	0.0	99	5	40-160	40
Perfluorohexanesulfonic acid	11.0	11.9	0.0	93	1	40-160	40
Perfluorohexanoic acid	12.2	13.0	0.0	94	6	40-160	40
Perfluorononanoic acid	11.8	13.0	0.09	90	5	40-160	40
Perfluorooctanesulfonamide	11.9	13.0	0.0	92	4	40-160	40
Perfluorooctanesulfonic acid	10.9	12.1	0.0	90	6	40-160	40
Perfluorooctanoic acid	13.0	13.0	0.0	100	0.8	40-160	40
Perfluorotetradecanoic acid	12.5	13.0	0.0	96	1	40-160	40
Perfluorotridecanoic acid	15.3	13.0	0.0	117	5	40-160	40
Perfluoroundecanoic acid	12.3	13.0	0.0	94	8	40-160	40

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	9.92	6.19	160	20-200
NULL	M2PFDoA	5.95	6.51	91	20-200
NULL	M2PFTeDA	6.61	6.51	102	20-200
NULL	M3PFBS	6.53	6.06	108	20-200
NULL	M3PFHxS	7.00	6.17	114	20-200
NULL	M5PFHxA	6.73	6.51	103	20-200
NULL	M6PFDA	7.20	6.51	111	20-200
NULL	M7PFUnA	8.24	6.51	127	20-200
NULL	M8FOSA	8.06	6.51	124	20-200
NULL	M8PFOA	6.69	6.51	103	20-200
NULL	M8PFOS	7.16	6.23	115	20-200
NULL	M9PFNA	7.07	6.51	109	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

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Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — QC Type : Matrix Spike

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1.402 g
Final Vol: 2 mL

Lab ID #: B22D173-MS1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D173-MS1
Source Lab ID #: 2202036-48

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: %

Analyte	Result	Spike Level	Source Result	%Rec	%Rec Limits
6:2 Fluorotelomer sulfonic acid	15.7	13.6	0.0	115	40-160
Perfluorobutanesulfonic acid	13.2	12.7	0.0	104	40-160
Perfluorodecanoic acid	15.5	14.3	0.0	108	40-160
Perfluorododecanoic acid	15.5	14.3	0.0	109	40-160
Perfluorohexanesulfonic acid	14.2	13.0	0.0	109	40-160
Perfluorohexanoic acid	14.6	14.3	0.0	103	40-160
Perfluorononanoic acid	15.6	14.3	0.0	110	40-160
Perfluorooctanesulfonamide	14.4	14.3	0.0	101	40-160
Perfluorooctanesulfonic acid	14.2	13.2	0.0	108	40-160
Perfluorooctanoic acid	15.4	14.3	0.0	108	40-160
Perfluorotetradecanoic acid	16.0	14.3	0.0	112	40-160
Perfluorotridecanoic acid	20.1	14.3	0.0	141	40-160
Perfluoroundecanoic acid	15.3	14.3	0.0	107	40-160

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.51	6.78	111	20-200
NULL	M2PFDoA	7.72	7.13	108	20-200
NULL	M2PFTeDA	7.39	7.13	104	20-200
NULL	M3PFBS	7.04	6.65	106	20-200
NULL	M3PFHxS	7.28	6.76	108	20-200
NULL	M5PFHxA	7.55	7.13	106	20-200
NULL	M6PFDA	7.26	7.13	102	20-200
NULL	M7PFUnA	7.64	7.13	107	20-200
NULL	M8FOSA	7.38	7.13	103	20-200
NULL	M8PFOA	7.23	7.13	101	20-200
NULL	M8PFOS	7.43	6.83	109	20-200
NULL	M9PFNA	7.35	7.13	103	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — QC Type : Matrix Spike Dup

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1.151 g
Final Vol: 2 mL

Lab ID #: B22D173-MSD1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D173-MSD1
Source Lab ID #: 2202036-48

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: %

Analyte	Sample Result	Spike Level	Source Result	%Rec	RPD	%Rec Limits	RPD Limit
6:2 Fluorotelomer sulfonic acid	17.6	16.5	0.0	107	12	40-160	40
Perfluorobutanesulfonic acid	16.5	15.4	0.0	107	22	40-160	40
Perfluorodecanoic acid	19.0	17.4	0.0	109	20	40-160	40
Perfluorododecanoic acid	18.6	17.4	0.0	107	18	40-160	40
Perfluorohexanesulfonic acid	16.5	15.9	0.0	104	15	40-160	40
Perfluorohexanoic acid	19.4	17.4	0.0	112	28	40-160	40
Perfluorononanoic acid	19.6	17.4	0.0	113	22	40-160	40
Perfluorooctanesulfonamide	18.4	17.4	0.0	106	24	40-160	40
Perfluorooctanesulfonic acid	17.3	16.1	0.0	107	19	40-160	40
Perfluorooctanoic acid	18.5	17.4	0.0	107	18	40-160	40
Perfluorotetradecanoic acid	19.2	17.4	0.0	110	18	40-160	40
Perfluorotridecanoic acid	22.1	17.4	0.0	127	10	40-160	40
Perfluoroundecanoic acid	18.9	17.4	0.0	109	21	40-160	40

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	9.71	8.26	118	20-200
NULL	M2PFDoA	9.48	8.69	109	20-200
NULL	M2PFTeDA	9.19	8.69	106	20-200
NULL	M3PFBS	8.40	8.10	104	20-200
NULL	M3PFHxS	9.43	8.24	114	20-200
NULL	M5PFHxA	8.85	8.69	102	20-200
NULL	M6PFDA	8.93	8.69	103	20-200
NULL	M7PFUnA	9.12	8.69	105	20-200
NULL	M8FOSA	8.72	8.69	100	20-200
NULL	M8PFOA	8.99	8.69	103	20-200
NULL	M8PFOS	8.90	8.32	107	20-200
NULL	M9PFNA	8.78	8.69	101	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — QC Type : Matrix Spike

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1.496 g
Final Vol: 2 mL

Lab ID #: B22D192-MS1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D192-MS1
Source Lab ID #: 2202036-06

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: %

Analyte	Result	Spike Level	Source Result	%Rec	%Rec Limits
6:2 Fluorotelomer sulfonic acid	12.9	12.7	0.0	101	40-160
Perfluorobutanesulfonic acid	11.5	11.9	0.0	97	40-160
Perfluorodecanoic acid	13.5	13.4	0.0	101	40-160
Perfluorododecanoic acid	14.4	13.4	0.0	107	40-160
Perfluorohexanesulfonic acid	12.0	12.2	0.0	98	40-160
Perfluorohexanoic acid	13.3	13.4	0.0	99	40-160
Perfluorononanoic acid	13.6	13.4	0.0	102	40-160
Perfluorooctanesulfonamide	12.8	13.4	0.0	96	40-160
Perfluorooctanesulfonic acid	12.5	12.4	0.07	100	40-160
Perfluorooctanoic acid	13.3	13.4	0.0	100	40-160
Perfluorotetradecanoic acid	14.0	13.4	0.0	105	40-160
Perfluorotridecanoic acid	16.0	13.4	0.0	119	40-160
Perfluoroundecanoic acid	14.0	13.4	0.08	104	40-160

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.70	6.36	121	20-200
NULL	M2PFDoA	7.40	6.68	111	20-200
NULL	M2PFTeDA	6.81	6.68	102	20-200
NULL	M3PFBS	7.01	6.23	113	20-200
NULL	M3PFHxS	7.51	6.34	119	20-200
NULL	M5PFHxA	6.89	6.68	103	20-200
NULL	M6PFDA	7.04	6.68	105	20-200
NULL	M7PFUnA	7.22	6.68	108	20-200
NULL	M8FOSA	6.99	6.68	105	20-200
NULL	M8PFOA	6.87	6.68	103	20-200
NULL	M8PFOS	7.02	6.40	110	20-200
NULL	M9PFNA	7.19	6.68	108	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — QC Type : Matrix Spike Dup

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1.615 g
Final Vol: 2 mL

Lab ID #: B22D192-MSD1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D192-MSD1
Source Lab ID #: 2202036-06

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: %

Analyte	Sample Result	Spike Level	Source Result	%Rec	RPD	%Rec Limits	RPD Limit
6:2 Fluorotelomer sulfonic acid	12.6	11.8	0.0	107	2	40-160	40
Perfluorobutanesulfonic acid	11.6	11.0	0.0	105	1	40-160	40
Perfluorodecanoic acid	13.3	12.4	0.0	108	2	40-160	40
Perfluorododecanoic acid	13.4	12.4	0.0	108	7	40-160	40
Perfluorohexanesulfonic acid	12.4	11.3	0.0	109	3	40-160	40
Perfluorohexanoic acid	12.8	12.4	0.0	103	4	40-160	40
Perfluorononanoic acid	13.6	12.4	0.0	109	0.7	40-160	40
Perfluorooctanesulfonamide	13.3	12.4	0.0	108	4	40-160	40
Perfluorooctanesulfonic acid	12.0	11.5	0.07	104	4	40-160	40
Perfluorooctanoic acid	13.4	12.4	0.0	108	0.3	40-160	40
Perfluorotetradecanoic acid	13.2	12.4	0.0	106	6	40-160	40
Perfluorotridecanoic acid	15.6	12.4	0.0	126	2	40-160	40
Perfluoroundecanoic acid	14.9	12.4	0.08	120	6	40-160	40

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	7.09	5.89	120	20-200
NULL	M2PFDoA	6.75	6.19	109	20-200
NULL	M2PFTeDA	6.08	6.19	98	20-200
NULL	M3PFBS	6.31	5.77	109	20-200
NULL	M3PFHxS	6.46	5.87	110	20-200
NULL	M5PFHxA	6.24	6.19	101	20-200
NULL	M6PFDA	6.67	6.19	108	20-200
NULL	M7PFUnA	6.28	6.19	101	20-200
NULL	M8FOSA	6.08	6.19	98	20-200
NULL	M8PFOA	6.14	6.19	99	20-200
NULL	M8PFOS	6.40	5.93	108	20-200
NULL	M9PFNA	6.31	6.19	102	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS

QC Type : Duplicate

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1.187 g
Final Vol: 2 mL

Lab ID #: B22D172-DUP1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D172-DUP1
Source Lab ID #: 2202036-42

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/22/2022
Matrix: Tissue
Units: ug/Kg ww

Analyte	Sample Result	Sample Qual	Source Result	RPD	RPD Limit
6:2 Fluorotelomer sulfonic acid	0.17	U	0.0	NC	40
Perfluorobutanesulfonic acid	0.17	U	0.0	NC	40
Perfluorodecanoic acid	0.17	U	0.0	NC	40
Perfluorododecanoic acid	0.17	U	0.0	NC	40
Perfluorohexanesulfonic acid	0.17	U	0.0	NC	40
Perfluorohexanoic acid	0.17	U	0.0	NC	40
Perfluorononanoic acid	0.17	U	0.0	NC	40
Perfluorooctanesulfonamide	0.17	U	0.0	NC	40
Perfluorooctanesulfonic acid	0.17	U	0.0	NC	40
Perfluorooctanoic acid	0.17	U	0.0	NC	40
Perfluorotetradecanoic acid	0.17	U	0.0	NC	40
Perfluorotridecanoic acid	0.17	U	0.0	NC	40
Perfluoroundecanoic acid	0.17	U	0.0	NC	40

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	9.40	8.01	117	20-200
NULL	M2PFDoA	6.98	8.42	83	20-200
NULL	M2PFTeDA	8.53	8.42	101	20-200
NULL	M3PFBS	8.23	7.85	105	20-200
NULL	M3PFHxS	8.77	7.99	110	20-200
NULL	M5PFHxA	8.26	8.42	98	20-200
NULL	M6PFDA	8.37	8.42	99	20-200
NULL	M7PFUnA	8.61	8.42	102	20-200
NULL	M8FOSA	8.34	8.42	99	20-200
NULL	M8PFOA	7.95	8.42	94	20-200
NULL	M8PFOS	8.50	8.07	105	20-200
NULL	M9PFNA	8.17	8.42	97	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS

QC Type : Duplicate

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1.503 g
Final Vol: 2 mL

Lab ID #: B22D173-DUP1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D173-DUP1
Source Lab ID #: 2202036-15

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/2/2022
Matrix: Tissue
Units: ug/Kg ww

Analyte	Sample Result	Sample Qual	Source Result	RPD	RPD Limit
6:2 Fluorotelomer sulfonic acid	0.13	U	0.0	NC	40
Perfluorobutanesulfonic acid	0.13	U	0.0	NC	40
Perfluorodecanoic acid	0.13	U	0.0	NC	40
Perfluorododecanoic acid	0.13	U	0.0	NC	40
Perfluorohexanesulfonic acid	0.13	U	0.0	NC	40
Perfluorohexanoic acid	0.13	U	0.0	NC	40
Perfluorononanoic acid	0.13	U	0.0	NC	40
Perfluorooctanesulfonamide	0.13	U	0.0	NC	40
Perfluorooctanesulfonic acid	0.13	U	0.0	NC	40
Perfluorooctanoic acid	0.13	U	0.0	NC	40
Perfluorotetradecanoic acid	0.13	U	0.0	NC	40
Perfluorotridecanoic acid	0.13	U	0.0	NC	40
Perfluoroundecanoic acid	0.13	U	0.0	NC	40

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	6.73	6.33	106	20-200
NULL	M2PFDoA	6.43	6.65	97	20-200
NULL	M2PFTeDA	6.96	6.65	105	20-200
NULL	M3PFBS	6.75	6.20	109	20-200
NULL	M3PFHxS	6.82	6.31	108	20-200
NULL	M5PFHxA	6.81	6.65	102	20-200
NULL	M6PFDA	6.83	6.65	103	20-200
NULL	M7PFUnA	6.65	6.65	100	20-200
NULL	M8FOSA	7.22	6.65	109	20-200
NULL	M8PFOA	6.57	6.65	99	20-200
NULL	M8PFOS	7.05	6.37	111	20-200
NULL	M9PFNA	7.00	6.65	105	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS

QC Type : Duplicate

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1.608 g
Final Vol: 2 mL

Lab ID #: B22D192-DUP1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D192-DUP1
Source Lab ID #: 2202036-01

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: ug/Kg ww

Analyte	Sample Result	Sample Qual	Source Result	RPD	RPD Limit
6:2 Fluorotelomer sulfonic acid	0.12	U	0.0	NC	40
Perfluorobutanesulfonic acid	0.12	U	0.0	NC	40
Perfluorodecanoic acid	0.12	U	0.0	NC	40
Perfluorododecanoic acid	0.12	U	0.0	NC	40
Perfluorohexanesulfonic acid	0.12	U	0.0	NC	40
Perfluorohexanoic acid	0.12	U	0.0	NC	40
Perfluorononanoic acid	0.12	U	0.0	NC	40
Perfluorooctanesulfonamide	0.12	U	0.0	NC	40
Perfluorooctanesulfonic acid	**0.05**	**J**	**0.07**	NC	40
Perfluorooctanoic acid	0.12	U	0.0	NC	40
Perfluorotetradecanoic acid	0.12	U	0.0	NC	40
Perfluorotridecanoic acid	0.12	U	0.0	NC	40
Perfluoroundecanoic acid	**0.07**	**J**	**0.09**	NC	40

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	6.47	5.91	109	20-200
NULL	M2PFDoA	6.92	6.22	111	20-200
NULL	M2PFTeDA	6.17	6.22	99	20-200
NULL	M3PFBS	6.64	5.80	115	20-200
NULL	M3PFHxS	7.07	5.90	120	20-200
NULL	M5PFHxA	6.68	6.22	107	20-200
NULL	M6PFDA	6.40	6.22	103	20-200
NULL	M7PFUnA	6.38	6.22	103	20-200
NULL	M8FOSA	6.33	6.22	102	20-200
NULL	M8PFOA	6.40	6.22	103	20-200
NULL	M8PFOS	6.88	5.96	116	20-200
NULL	M9PFNA	6.81	6.22	110	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS

QC Type : Reference

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 1.037 g
Final Vol: 2 mL

Lab ID #: B22D172-SRM1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D172-SRM1

Batch ID: B22D172
Prepared: 4/14/2022
Analyzed: 4/22/2022
Matrix: Tissue
Units: %

Analyte	Result	Spike Level	LLOQ	%Rec	%Rec Limits
Perfluorooctanesulfonic acid	**2.97**	**2.19**	**0.19**	**136**	20-200

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	26.2	9.17	286	20-200
NULL	M2PFDoA	8.89	9.64	92	20-200
NULL	M2PFTeDA	7.75	9.64	80	20-200
NULL	M3PFBS	8.08	8.99	90	20-200
NULL	M3PFHxS	9.44	9.14	103	20-200
NULL	M5PFHxA	9.15	9.64	95	20-200
NULL	M6PFDA	9.01	9.64	93	20-200
NULL	M7PFUnA	11.6	9.64	121	20-200
NULL	M8FOSA	16.1	9.64	167	20-200
NULL	M8PFOA	8.58	9.64	89	20-200
NULL	M8PFOS	9.06	9.24	98	20-200
NULL	M9PFNA	8.65	9.64	90	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS — QC Type : Reference

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 0.536 g
Final Vol: 2 mL

Lab ID #: B22D173-SRM1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D173-SRM1

Batch ID: B22D173
Prepared: 4/25/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: %

Analyte	Result	Spike Level	LLOQ	%Rec	%Rec Limits
Perfluorooctanesulfonic acid	**2.83**	**2.19**	**0.37**	**129**	20-200

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	30.6	17.7	173	20-200
NULL	M2PFDoA	20.2	18.7	108	20-200
NULL	M2PFTeDA	17.5	18.7	94	20-200
NULL	M3PFBS	18.1	17.4	104	20-200
NULL	M3PFHxS	21.3	17.7	121	20-200
NULL	M5PFHxA	20.9	18.7	112	20-200
NULL	M6PFDA	19.3	18.7	104	20-200
NULL	M7PFUnA	19.6	18.7	105	20-200
NULL	M8FOSA	21.9	18.7	117	20-200
NULL	M8PFOA	19.5	18.7	104	20-200
NULL	M8PFOS	19.2	17.9	108	20-200
NULL	M9PFNA	20.2	18.7	109	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Per- and polyfluoroalkyl substances by LCMSMS

Project: DOH PFAS

QC Type : Reference

Work Order: Batch QC
Project Officer: Christie, Emerson
Initial Vol: 0.504 g
Final Vol: 2 mL

Lab ID #: B22D192-SRM1
Prep Method: AOAC2007.01-P
Analysis Method: SW8327
Source Field ID: B22D192-SRM1

Batch ID: B22D192
Prepared: 4/28/2022
Analyzed: 5/3/2022
Matrix: Tissue
Units: %

Analyte	Result	Spike Level	LLOQ	%Rec	%Rec Limits
Perfluorooctanesulfonic acid	**2.66**	**2.19**	**0.40**	**121**	20-200

Surrogate Recovery:

CAS#	Analyte	Sample Result	Spike Level	% Rec.	% Rec. Limits
NULL	M2-6:2 FTS	26.9	18.9	143	20-200
NULL	M2PFDoA	20.6	19.8	104	20-200
NULL	M2PFTeDA	18.2	19.8	92	20-200
NULL	M3PFBS	18.7	18.5	101	20-200
NULL	M3PFHxS	22.8	18.8	121	20-200
NULL	M5PFHxA	20.5	19.8	103	20-200
NULL	M6PFDA	19.3	19.8	97	20-200
NULL	M7PFUnA	20.8	19.8	105	20-200
NULL	M8FOSA	21.8	19.8	110	20-200
NULL	M8PFOA	19.3	19.8	97	20-200
NULL	M8PFOS	19.8	19.0	104	20-200
NULL	M9PFNA	19.7	19.8	99	20-200

Authorized by: Jerod Romine **Release Date:** 5/16/2022

Appendix A
Sample Correlation Table

Batch ID: B22D172 **Prep Method:** AOAC2007.01-P

Prepared: 4/14/2022 **Analysis Method:** SW8327

Field ID	MEL ID
HAL-27	2202036-27
HAL-28	2202036-28
HAL-29	2202036-29
HAL-30	2202036-30
RSP-31	2202036-31
RSP-32	2202036-32
RSP-33	2202036-33
RSP-34	2202036-34
RSP-35	2202036-35
POL-36	2202036-36
POL-37	2202036-37
POL-38	2202036-38
POL-39	2202036-39
POL-40	2202036-40
CHK-41	2202036-41
CHK-42	2202036-42
CHK-43	2202036-43
CHK-44	2202036-44
CHK-45	2202036-45
TIL-46	2202036-46
Blank	B22D172-BLK1
LCS	B22D172-BS1
LCS Dup	B22D172-BSD1
Duplicate (CHK-42)	B22D172-DUP1
Matrix Spike (RSP-32)	B22D172-MS1
Matrix Spike Dup (RSP-32)	B22D172-MSD1
Reference	B22D172-SRM1

Appendix A
Sample Correlation Table

Batch ID: B22D173 **Prep Method:** AOAC2007.01-P

Prepared: 4/25/2022 **Analysis Method:** SW8327

Field ID	MEL ID
CAT-12	2202036-12
CAT-13	2202036-13
CAT-14	2202036-14
CAT-15	2202036-15
COD-16	2202036-16
COD-17	2202036-17
COD-18	2202036-18
COD-19	2202036-19
COD-20	2202036-20
FDR-21	2202036-21
FDR-22	2202036-22
FDR-23	2202036-23
FDR-24	2202036-24
FDR-25	2202036-25
HAL-26	2202036-26
TIL-47	2202036-47
TIL-48	2202036-48
TIL-49	2202036-49
TIL-50	2202036-50
CAT-51	2202036-51
Blank	B22D173-BLK1
LCS	B22D173-BS1
LCS Dup	B22D173-BSD1
Duplicate (CAT-15)	B22D173-DUP1
Matrix Spike (TIL-48)	B22D173-MS1
Matrix Spike Dup (TIL-48)	B22D173-MSD1
Reference	B22D173-SRM1

Appendix A
Sample Correlation Table

Batch ID: B22D192 **Prep Method:** AOAC2007.01-P

Prepared: 4/28/2022 **Analysis Method:** SW8327

Field ID	MEL ID
LTN-01	2202036-01
LTN-02	2202036-02
LTN-03	2202036-03
LTN-04	2202036-04
LTN-05	2202036-05
WTN-06	2202036-06
WTN-07	2202036-07
WTN-08	2202036-08
WTN-09	2202036-09
WTN-10	2202036-10
CAT-11	2202036-11
Blank	B22D192-BLK1
LCS	B22D192-BS1
LCS Dup	B22D192-BSD1
Duplicate (LTN-01)	B22D192-DUP1
Matrix Spike (WTN-06)	B22D192-MS1
Matrix Spike Dup (WTN-06)	B22D192-MSD1
Reference	B22D192-SRM1

Appendix B
Manual Qualification Table

WO: 2202036 **Analysis:** PFAS

No manual qualifiers were added to the samples or batch QC.

Appendix C
Data Qualifier Definitions

Code	Definition
E	Reported result is an estimate because it exceeds the calibration range.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the present of an analyte for which there is presumptive evidence to make a “tentative identification”.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
NAF	Not analyzed for.
NC	Not calculated.
REJ	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
U	The analyte was not detected at or above the reported sample quantitation limit.
UJ	The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
bold	The analyte was present in the sample. (Visual aid to locate detected compounds on the analytical report.)

Appendix D
QC Exceptions Report

Lab ID	Analyte	Exception
B22D172-SRM1	surr: M2-6:2 FTS	Exceeds upper control limit

QC Exceptions determined using unrounded QC results but are reported as integers throughout this analytical report.

Appendix E
Initial Calibration Exceptions Report

Calibration ID: B2E0601 **Analysis:** PFAS

LabNumber	Analyte	QC Exception

No ICAL exceptions.

Appendix E
Initial Calibration Exceptions Report

Calibration ID: B2E1201 **Analysis:** PFAS

LabNumber	Analyte	QC Exception

No ICAL exceptions.


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