

ANALYTICAL RESULTS

Sample ID: Method Blank						PFAS Isotope Dilution Method					
Client Data Name: SKOOKUM Contract Services Project: PFC Monthly Sampling - FY19 June						Laboratory Data Lab Sample: B9F0133-BLK1 Column: BEH C18					
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
PFHxA	307-24-4	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
PFHpA	375-85-9	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
PFHxS	355-46-4	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
PFOA	335-67-1	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
PFNA	375-95-1	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
PFOS	1763-23-1	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
PFDA	335-76-2	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
MeFOSAA	2355-31-9	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
EtFOSAA	2991-50-6	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
PFUnA	2058-94-8	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
PFDaA	307-55-1	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
PFTDA	72629-94-8	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
PFTeDA	376-06-7	ND	2.74	4.00	8.00		B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers		Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	99.9	50 - 150				B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
13C2-PFHxA	IS	97.9	50 - 150				B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
13C4-PFHpA	IS	104	50 - 150				B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
13C3-PFHxS	IS	96.4	50 - 150				B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
13C2-PFOA	IS	90.8	50 - 150				B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
13C5-PFNA	IS	88.9	50 - 150				B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
13C8-PFOS	IS	98.4	50 - 150				B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
13C2-PFDA	IS	89.0	50 - 150				B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
d3-MeFOSAA	IS	81.2	50 - 150				B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
d5-EtFOSAA	IS	84.8	50 - 150				B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
13C2-PFUnA	IS	81.0	50 - 150				B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
13C2-PFDaA	IS	80.7	50 - 150				B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1
13C2-PFTeDA	IS	87.8	50 - 150				B9F0133	17-Jun-19	0.125 L	18-Jun-19 23:07	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: LCSD

PFAS Isotope Dilution Method

Name:	SKOOKUM Contract Services	Lab Sample:	B9F0133-BS1/B9F0133-BSD1	Date Extracted:	17-Jun-19
Project:	PFC Monthly Sampling - FY19 June	QC Batch:	B9F0133	Column:	BEH C18
Matrix:	Aqueous	Samp Size:	0.125/0.125 L		

Analyte	CAS Number	LCS (ng/L)	LCS Spike Amt	LCS % Rec	LCS Quals	LCSD (ng/L)	LCSD Spike Amt	LCSD % Rec	RPD	LCSD Quals	%Rec Limits	RPD Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
PFBS	375-73-5	68.4	80.0	85.5		73.6	80.0	92.0	7.40		70-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1
PFHxA	307-24-4	85.3	80.0	107		86.5	80.0	108	1.46		70-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1
PFHpA	375-85-9	79.6	80.0	99.5		78.5	80.0	98.1	1.47		70-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1
PFHxS	355-46-4	80.7	80.0	101		77.0	80.0	96.3	4.71		70-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1
PFOA	335-67-1	72.7	80.0	90.8		80.1	80.0	100	9.70		70-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1
PFNA	375-95-1	82.6	80.0	103		81.3	80.0	102	1.58		70-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1
PFOS	1763-23-1	79.2	80.0	99.0		74.5	80.0	93.2	6.01		70-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1
PFDA	335-76-2	80.0	80.0	100		85.0	80.0	106	6.16		70-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1
MeFOSAA	2355-31-9	78.6	80.0	98.2		72.5	80.0	90.6	8.10		70-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1
EtFOSAA	2991-50-6	82.7	80.0	103		72.2	80.0	90.2	13.6		70-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1
PFUnA	2058-94-8	91.2	80.0	114		81.6	80.0	102	11.1		70-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1
PFDoA	307-55-1	93.9	80.0	117		86.5	80.0	108	8.24		70-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1
PFTTrDA	72629-94-8	87.3	80.0	109		93.4	80.0	117	6.71		60-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1
PFTeDA	376-06-7	83.4	80.0	104		84.8	80.0	106	1.73		70-130	30	18-Jun-19 22:46	1	18-Jun-19 22:56	1

Labeled Standards	Type	LCS % Rec	LCS Quals	LCSD % Rec	LCSD Quals	Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
13C3-PFBS	IS	104		102		50-150	18-Jun-19 22:46	1	18-Jun-19 22:56	1
13C2-PFHxA	IS	103		101		50-150	18-Jun-19 22:46	1	18-Jun-19 22:56	1
13C4-PFHpA	IS	105		101		50-150	18-Jun-19 22:46	1	18-Jun-19 22:56	1
13C3-PFHxS	IS	95.4		105		50-150	18-Jun-19 22:46	1	18-Jun-19 22:56	1
13C2-PFOA	IS	96.1		96.9		50-150	18-Jun-19 22:46	1	18-Jun-19 22:56	1
13C5-PFNA	IS	87.9		90.4		50-150	18-Jun-19 22:46	1	18-Jun-19 22:56	1
13C8-PFOS	IS	95.7		93.6		50-150	18-Jun-19 22:46	1	18-Jun-19 22:56	1
13C2-PFDA	IS	83.7		78.1		50-150	18-Jun-19 22:46	1	18-Jun-19 22:56	1
d3-MeFOSAA	IS	72.8		80.5		50-150	18-Jun-19 22:46	1	18-Jun-19 22:56	1
d5-EtFOSAA	IS	74.4		79.3		50-150	18-Jun-19 22:46	1	18-Jun-19 22:56	1
13C2-PFUnA	IS	67.6		76.9		50-150	18-Jun-19 22:46	1	18-Jun-19 22:56	1
13C2-PFDoA	IS	64.4		69.2		50-150	18-Jun-19 22:46	1	18-Jun-19 22:56	1
13C2-PFTeDA	IS	78.1		83.7		50-150	18-Jun-19 22:46	1	18-Jun-19 22:56	1

Sample ID: PFC-AF-01-03-061119
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	SKOOKUM Contract Services	Matrix:	Aqueous	Lab Sample:	1901559-03	Column:	BEH C18
Project:	PFC Monthly Sampling - FY19 June	Date Collected:	11-Jun-19 14:20	Date Received:	13-Jun-19 09:59		
Location:	#3, E Property, Map Grid E13						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	7.81	2.99	4.39	8.74	J	B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
PFHxA	307-24-4	18.0	2.99	4.39	8.74		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
PFHpA	375-85-9	6.17	2.99	4.39	8.74	J	B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
PFHxS	355-46-4	46.4	2.99	4.39	8.74		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
PFOA	335-67-1	23.1	2.99	4.39	8.74		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
PFNA	375-95-1	ND	2.99	4.39	8.74		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
PFOS	1763-23-1	57.8	2.99	4.39	8.74		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
PFDA	335-76-2	ND	2.99	4.39	8.74		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
MeFOSAA	2355-31-9	ND	2.99	4.39	8.74		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
EtFOSAA	2991-50-6	ND	2.99	4.39	8.74		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
PFUnA	2058-94-8	ND	2.99	4.39	8.74		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
PFDaA	307-55-1	ND	2.99	4.39	8.74		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
PFTDA	72629-94-8	ND	2.99	4.39	8.74		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
PFTeDA	376-06-7	ND	2.99	4.39	8.74		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	98.0	50 - 150		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
13C2-PFHxA	IS	90.6	50 - 150		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
13C4-PFHpA	IS	93.6	50 - 150		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
13C3-PFHxS	IS	95.9	50 - 150		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
13C2-PFOA	IS	82.8	50 - 150		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
13C5-PFNA	IS	85.5	50 - 150		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
13C8-PFOS	IS	93.8	50 - 150		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
13C2-PFDA	IS	89.1	50 - 150		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
d3-MeFOSAA	IS	88.5	50 - 150		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
d5-EtFOSAA	IS	91.7	50 - 150		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
13C2-PFUnA	IS	81.8	50 - 150		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
13C2-PFDaA	IS	95.4	50 - 150		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1
13C2-PFTeDA	IS	98.6	50 - 150		B9F0133	17-Jun-19	0.114 L	18-Jun-19 23:39	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
D	Dilution
DL	Detection limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limits of Detection
LOQ	Limits of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
NA	Not applicable
ND	Not Detected
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)
*	See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-20
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718-B
New Jersey Department of Environmental Protection	180001
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	015
Texas Commission on Environmental Quality	T104704189-19-10
Virginia Department of General Services	10272
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	Method
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	Method
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	Method
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A