

ANALYTICAL RESULTS

Sample ID: Method Blank						PFAS Isotope Dilution Method					
Client Data Name: SKOOKUM Contract Services Project: PFC Monthly Sampling Part A, FY19 May						Laboratory Data Lab Sample: B9E0080-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		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
PFHxA	307-24-4	ND	2.74	4.00	8.00		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
PFHpA	375-85-9	ND	2.74	4.00	8.00		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
PFHxS	355-46-4	ND	2.74	4.00	8.00		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
PFOA	335-67-1	ND	2.74	4.00	8.00		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
PFNA	375-95-1	ND	2.74	4.00	8.00		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
PFOS	1763-23-1	ND	2.74	4.00	8.00		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
PFDA	335-76-2	ND	2.74	4.00	8.00		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
MeFOSAA	2355-31-9	ND	2.74	4.00	8.00		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
EtFOSAA	2991-50-6	ND	2.74	4.00	8.00		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
PFOA	2058-94-8	ND	2.74	4.00	8.00		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
PFDoA	307-55-1	ND	2.74	4.00	8.00		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
PFTDA	72629-94-8	ND	2.74	4.00	8.00		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
PFTeDA	376-06-7	ND	2.74	4.00	8.00		B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers		Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	99.6	50 - 150				B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
13C2-PFHxA	IS	94.4	50 - 150				B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
13C4-PFHpA	IS	88.6	50 - 150				B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
13C3-PFHxS	IS	97.8	50 - 150				B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
13C2-PFOA	IS	86.0	50 - 150				B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
13C5-PFNA	IS	78.7	50 - 150				B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
13C8-PFOS	IS	90.0	50 - 150				B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
13C2-PFDA	IS	65.5	50 - 150				B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
d3-MeFOSAA	IS	58.7	50 - 150				B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
d5-EtFOSAA	IS	56.9	50 - 150				B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
13C2-PFOA	IS	61.2	50 - 150				B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
13C2-PFDoA	IS	60.4	50 - 150				B9E0080	10-May-19	0.125 L	13-May-19 17:37	1
13C2-PFTeDA	IS	81.1	50 - 150				B9E0080	10-May-19	0.125 L	13-May-19 17:37	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:	B9E0080-BS1/B9E0080-BSD1	Date Extracted:	10-May-19
Project:	PFC Monthly Sampling Part A, FY19 May	QC Batch:	B9E0080	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	90.4	80.0	113		84.6	80.0	106	6.61		70-130	30	13-May-19 17:15	1	13-May-19 17:26	1
PFHxA	307-24-4	99.4	80.0	124		95.5	80.0	119	4.06		70-130	30	13-May-19 17:15	1	13-May-19 17:26	1
PFHpA	375-85-9	90.5	80.0	113		90.2	80.0	113	0.234		70-130	30	13-May-19 17:15	1	13-May-19 17:26	1
PFHxS	355-46-4	88.3	80.0	110		89.2	80.0	112	1.08		70-130	30	13-May-19 17:15	1	13-May-19 17:26	1
PFOA	335-67-1	91.3	80.0	114		94.2	80.0	118	3.11		70-130	30	13-May-19 17:15	1	13-May-19 17:26	1
PFNA	375-95-1	91.4	80.0	114		97.5	80.0	122	6.44		70-130	30	13-May-19 17:15	1	13-May-19 17:26	1
PFOS	1763-23-1	94.4	80.0	118		90.8	80.0	113	3.92		70-130	30	13-May-19 17:15	1	13-May-19 17:26	1
PFDA	335-76-2	89.8	80.0	112		95.5	80.0	119	6.24		70-130	30	13-May-19 17:15	1	13-May-19 17:26	1
MeFOSAA	2355-31-9	89.0	80.0	111		84.5	80.0	106	5.20		70-130	30	13-May-19 17:15	1	13-May-19 17:26	1
EtFOSAA	2991-50-6	82.0	80.0	102		85.0	80.0	106	3.64		70-130	30	13-May-19 17:15	1	13-May-19 17:26	1
PFUnA	2058-94-8	87.2	80.0	109		93.9	80.0	117	7.40		70-130	30	13-May-19 17:15	1	13-May-19 17:26	1
PFDoA	307-55-1	85.4	80.0	107		86.0	80.0	108	0.677		70-130	30	13-May-19 17:15	1	13-May-19 17:26	1
PFTTrDA	72629-94-8	96.8	80.0	121		96.1	80.0	120	0.695		60-130	30	13-May-19 17:15	1	13-May-19 17:26	1
PFTeDA	376-06-7	93.1	80.0	116		92.9	80.0	116	0.272		70-130	30	13-May-19 17:15	1	13-May-19 17:26	1

Labeled Standards	Type	LCS % Rec	LCS Quals	LCSD % Rec	LCSD Quals	Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
13C3-PFBS	IS	94.9		99.6		50-150	13-May-19 17:15	1	13-May-19 17:26	1
13C2-PFHxA	IS	93.7		93.6		50-150	13-May-19 17:15	1	13-May-19 17:26	1
13C4-PFHpA	IS	93.8		96.6		50-150	13-May-19 17:15	1	13-May-19 17:26	1
13C3-PFHxS	IS	97.2		94.3		50-150	13-May-19 17:15	1	13-May-19 17:26	1
13C2-PFOA	IS	94.6		87.6		50-150	13-May-19 17:15	1	13-May-19 17:26	1
13C5-PFNA	IS	87.3		80.4		50-150	13-May-19 17:15	1	13-May-19 17:26	1
13C8-PFOS	IS	89.6		97.1		50-150	13-May-19 17:15	1	13-May-19 17:26	1
13C2-PFDA	IS	72.8		78.0		50-150	13-May-19 17:15	1	13-May-19 17:26	1
d3-MeFOSAA	IS	65.7		74.5		50-150	13-May-19 17:15	1	13-May-19 17:26	1
d5-EtFOSAA	IS	67.9		76.9		50-150	13-May-19 17:15	1	13-May-19 17:26	1
13C2-PFUnA	IS	59.9		66.5		50-150	13-May-19 17:15	1	13-May-19 17:26	1
13C2-PFDoA	IS	59.5		73.8		50-150	13-May-19 17:15	1	13-May-19 17:26	1
13C2-PFTeDA	IS	77.3		84.3		50-150	13-May-19 17:15	1	13-May-19 17:26	1

Sample ID: PFC-AF-01-03-050719
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	SKOOKUM Contract Services	Matrix:	Aqueous	Lab Sample:	1901042-03	Column:	BEH C18
Project:	PFC Monthly Sampling Part A, FY19 May	Date Collected:	07-May-19 10:15	Date Received:	09-May-19 09:44		
Location:	E Property, Map Grid E13 #3						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	9.79	2.95	4.31	8.60	J	B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
PFHxA	307-24-4	26.9	2.95	4.31	8.60		B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
PFHpA	375-85-9	8.44	2.95	4.31	8.60		B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
PFHxS	355-46-4	66.8	2.95	4.31	8.60		B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
PFOA	335-67-1	38.8	2.95	4.31	8.60		B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
PFNA	375-95-1	ND	2.95	4.31	8.60		B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
PFOS	1763-23-1	79.7	2.95	4.31	8.60		B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
PFDA	335-76-2	ND	2.95	4.31	8.60		B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
MeFOSAA	2355-31-9	ND	2.95	4.31	8.60		B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
EtFOSAA	2991-50-6	ND	2.95	4.31	8.60		B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
PFUnA	2058-94-8	ND	2.95	4.31	8.60		B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
PFDoA	307-55-1	ND	2.95	4.31	8.60		B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
PFTrDA	72629-94-8	ND	2.95	4.31	8.60		B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
PFTeDA	376-06-7	ND	2.95	4.31	8.60		B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
Labeled Standards	Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	99.3		50 - 150			B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
13C2-PFHxA	IS	92.1		50 - 150			B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
13C4-PFHpA	IS	95.1		50 - 150			B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
13C3-PFHxS	IS	95.4		50 - 150			B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
13C2-PFOA	IS	90.7		50 - 150			B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
13C5-PFNA	IS	82.5		50 - 150			B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
13C8-PFOS	IS	90.7		50 - 150			B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
13C2-PFDA	IS	79.1		50 - 150			B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
d3-MeFOSAA	IS	89.0		50 - 150			B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
d5-EtFOSAA	IS	93.6		50 - 150			B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
13C2-PFUnA	IS	84.8		50 - 150			B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
13C2-PFDoA	IS	92.8		50 - 150			B9E0080	10-May-19	0.116 L	13-May-19 18:08	1
13C2-PFTeDA	IS	99.5		50 - 150			B9E0080	10-May-19	0.116 L	13-May-19 18:08	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
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
New Jersey Department of Environmental Protection	CA003
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	9618
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