

County of Brunswick

3954 Clearwell Dr NE
Leland, NC 28451

NW Lab

Leland, NC

Samples Received: 07/24/20

Analytical Report
0720-783

Isotope Dilution Method

PFAS



Enthalpy Analytical, LLC – Ultratrace

Lindsay Boone

O: (910) 212-5855 / F: 910-212-5866

lboone@enthalpy.com / www.enthalpy.com

2714 Exchange Drive, Wilmington, NC 28405

I certify that to the best of my knowledge all analytical data presented in this report:

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF) and contains _____ pages.

Report Issued Date: _____



Summary of Results

Enthalpy Analytical

Job No.: 0720-783 PFAS by Isotope Dilution (non-potable water)

County of Brunswick Site: N.W. Lab

Summary

	Compound	CAS	072420-SO1 ng/L	072420-EO1 ng/L
Acids	PFBA	375-22-4	5.29	ND U
	PFPeA	2706-90-3	8.02	8.13
	PFHxA	307-24-4	6.27	5.71
	PFHpA	375-85-9	3.70	3.47
	PFOA	335-67-1	6.94	6.25
	PFNA	375-95-1	0.872	0.828
	PFDA	335-76-2	0.444	0.379
	PFUnDA	2058-94-8	ND U	0.0413 L
	PFDoDA	307-55-1	0.0195 L	0.0139 L
	PFTriDA	72629-94-8	0.0612 L	0.0207 L
Sulfonates	PFTeDA	376-06-7	0.306	ND U
	PFBS	375-73-5	ND U	ND U
	PFPeS	2706-91-4	0.705	0.574
	PFHxS	355-46-4	4.99	3.74
	PFHpS	375-92-8	ND U	0.211
	PFOS	1763-23-1	11.2	11.3
	PFNS	68259-12-1	ND U	ND U
	PFDS	335-77-3	ND U	ND U
	4:2 FTS	757124-72-4	ND U	ND U
	6:2 FTS	27619-97-2	ND U	ND U
other	8:2 FTS	39108-34-4	ND U	ND U
	PFOSA	754-91-6	ND U	ND U
	N-MeFOSAA	2355-31-9	ND U	ND U
	N-EtFOSAA	2991-50-6	0.276	0.187
	HFPO-DA	13252-13-6	15.2	15.2
	PFMOAA	674-13-5	143	114
	PFMOPrA	377-73-1	ND U	ND U
	PFO2HxA	39492-88-1	8.85	11.6
	PFO3OA	39492-89-2	16.4	18.6
	PFO4DA	39492-90-5	ND U	ND U
other	Nafion Byproduct 1	29311-67-9	ND U	ND U
	ADONA	919005-14-4	ND U	ND U
	9Cl-PF3ONS	756426-58-1	ND U	ND U
	11Cl-PF3OUdS	763051-92-9	ND U	ND U
	10:2 FTS	120226-60-0	ND U	ND U
	FBSA	30334-69-1	0.330	0.297
	N-EtFOSA	4151-50-2	ND U	ND U
	N-EtFOSE	1691-99-2	ND U	ND U
	N-MeFOSA	31506-32-8	ND U	ND U
	N-MeFOSE	24448-09-7	ND U	ND U
other	Nafion Byproduct 2	749836-20-2	1.19 L	1.17 L
	NFDHA	151772-58-6	ND U	ND U
	PEPA		24.0	16.4
	PFECA-G	801212-59-9	ND U	ND U
	PFEESA	113507-82-7	ND U	ND U
	PFHxDA	67905-19-5	ND U	ND U
	PFMOBA	863090-89-5	ND U	ND U
	PFO5DA	39492-91-6	ND U	ND U
	PMPA	13140-29-9	14.1	19.5

Detailed Results

Enthalpy Analytical

Job No.: 0720-783 PFAS by Isotope Dilution (non-potable water)

County of Brunswick Site: N.W. Lab

Enthalpy ID	0720-783-001-1	Prep Batch	EU11040	Sample Vol (mL)	287.43
Sample Name	072420-SO1	Prep Date	2020-07-27	Extract Vol (mL)	0.4
Matrix	Aqueous	Analysis Date	2020-07-28	Dilution Factor	1
Sampling Date	20200724 00:00				

	Compound	CAS	Extract Concentration ng/L	Sample Concentration ng/L	Formatted Result ng/L	LOD ng/L	LOQ ng/L	Recovery	Flags
Acids	PFBA	375-22-4	3801.02	5.29	5.29	0.137	0.178		
	PFPeA	2706-90-3	5765.46	8.02	8.02	0.0781	0.178		
	PFHxA	307-24-4	4503.03	6.27	6.27	0.137	0.178		
	PFHpA	375-85-9	2660.39	3.70	3.70	0.0604	0.178		
	PFOA	335-67-1	4985.21	6.94	6.94	0.0691	0.178		
	PFNA	375-95-1	626.76	0.872	0.872	0.0443	0.178		
	PFDA	335-76-2	319.16	0.444	0.444	0.109	0.178		
	PFUnDA	2058-94-8	ND	ND	ND	0.0418	0.178		U
	PFDoDA	307-55-1	14.01	0.0195	0.0195	0.0413	0.178		L
	PFTriDA	72629-94-8	43.96	0.0612	0.0612	0.0648	0.178		L
	PFTeDA	376-06-7	219.69	0.306	0.306	0.0722	0.178		
Sulfonates	PFBS	375-73-5	ND	ND	ND	0.0722	0.178		U
	PFPeS	2706-91-4	506.33	0.705	0.705	0.0861	0.178		
	PFHxS	355-46-4	3583.38	4.99	4.99	0.0719	0.178		
	PFHpS	375-92-8	ND	ND	ND	0.0678	0.178		U
	PFOS	1763-23-1	8055.53	11.2	11.2	0.0410	0.178		
	PFNS	68259-12-1	ND	ND	ND	0.0569	0.178		U
	PFDS	335-77-3	ND	ND	ND	0.117	0.178		U
	4:2 FTS	757124-72-4	ND	ND	ND	0.0562	0.178		U
	6:2 FTS	27619-97-2	ND	ND	ND	0.0629	0.178		U
	8:2 FTS	39108-34-4	ND	ND	ND	0.0495	0.178		U
other	PFOSA	754-91-6	ND	ND	ND	0.317	0.319		U
	N-MeFOSAA	2355-31-9	ND	ND	ND	0.0473	0.178		U
	N-EiFOSAA	2991-50-6	198.21	0.276	0.276	0.0566	0.178		
	HFPO-DA	13252-13-6	10906.17	15.2	15.2	0.0828	0.178		
	PFMOAA	674-13-5	102705.86	143	143	1.29	1.29		
	PFMOPrA	377-73-1	ND	ND	ND	0.209	0.178		U
	PFO2HxA	39492-88-1	6359.99	8.85	8.85	1.29	1.29		U
	PFO3OA	39492-89-2	11802.42	16.4	16.4	1.29	1.29		
	PFO4DA	39492-90-5	ND	ND	ND	1.29	1.29		U
	Nafion Byproduct 1	29311-67-9	ND	ND	ND	0.209	0.178		U
	ADONA	919005-14-4	ND	ND	ND	0.104	0.178		U
	9Cl-PF3ONS	756426-58-1	ND	ND	ND	0.104	0.178		U
	11Cl-PF3OUdS	763051-92-9	ND	ND	ND	0.104	0.178		U
	10:2 FTS	120226-60-0	ND	ND	ND	0.209	0.178		U
	FBSA	30334-69-1	237.15	0.330	0.330	0.209	0.178		
	N-EiFOSA	4151-50-2	ND	ND	ND	0.209	0.178		U
	N-EiFOSE	1691-99-2	ND	ND	ND	6.26	6.26		U
	N-MeFOSA	31506-32-8	ND	ND	ND	0.209	0.178		U
	N-MeFOSE	24448-09-7	ND	ND	ND	6.26	6.26		U
	Nafion Byproduct 2	749836-20-2	855.51	1.19	1.19	1.29	1.29		L
	NFDHA	151772-58-6	ND	ND	ND	0.209	0.178		U
	PEPA		17223.38	24.0	24.0	1.29	1.29		
	PFECA-G	801212-59-9	ND	ND	ND	1.29	1.29		U
	PFEEA	113507-82-7	ND	ND	ND	0.209	0.178		U
	PFHxDA	67905-19-5	ND	ND	ND	1.29	1.29		U
	PFMOBA	863090-89-5	ND	ND	ND	1.29	1.29		U
	PFO5DA	39492-91-6	ND	ND	ND	2.62	2.62		U
	PMPA	13140-29-9	10144.88	14.1	14.1	1.29	1.29		
ES	MPFBA		5027.73	7.00				26.6%	
	M5PFPeA		13335.33	18.6				66.9%	
	M3PFBS		20866.03	29.0				103.8%	
	M2-4:2 FTS		53252.08	74.1				274.7%	Q
	M5PFHxA		4599.11	6.40				102.2%	
	M3HFPO-DA		4735.35	6.59				103.1%	
	M4PFHpA		4979.58	6.93				107.9%	
	M3PFHxS		5229.49	7.28				106.8%	
	M2-6:2 FTS		28796.38	40.1				154.5%	Q
	M8PFOA		5108.92	7.11				109.1%	
	M9PFNA		5034.99	7.01				107.9%	
	M8PFOS		4925.89	6.86				99.3%	
	M2-8:2 FTS		5732.18	7.98				126.2%	
	M8FOSA-I		3339.51	4.65				67.7%	
	M6PFDA		4968.96	6.92				105.2%	
	d3-N-MeFOSAA		4811.14	6.70				99.9%	
	d5-N-EiFOSAA		4675.16	6.51				94.3%	
	M7PFUDa		4650.75	6.47				102.3%	
	MPFDoA		3230.83	4.50				75.5%	
	M2PFTeDA		1478.95	2.06				35.2%	

Enthalpy Analytical

Job No.: 0720-783 PFAS by Isotope Dilution (non-potable water)

County of Brunswick Site: N.W. Lab

Enthalpy ID 0720-783-002-1

Prep Batch EU11040

Sample Vol (mL) 276.35

Sample Name 072420-EO1

Prep Date 2020-07-27

Extract Vol (mL) 0.4

Matrix Aqueous

Analysis Date 2020-07-28

Dilution Factor 1

Sampling Date 20200724 00:00

	Compound	CAS	Extract Concentration ng/L	Sample Concentration ng/L	Formatted Result ng/L	LOD ng/L	LOQ ng/L	Recovery	Flags
Acids	PFBA	375-22-4	ND	ND	ND	0.142	0.185		U
	PFPeA	2706-90-3	5619.07	8.13	8.13	0.0812	0.185		
	PFHxA	307-24-4	3942.11	5.71	5.71	0.143	0.185		
	PFFHpA	375-85-9	2400.24	3.47	3.47	0.0629	0.185		
	PFOA	335-67-1	4319.92	6.25	6.25	0.0719	0.185		
	PFNA	375-95-1	572.26	0.828	0.828	0.0460	0.185		
	PFDA	335-76-2	261.53	0.379	0.379	0.113	0.185		
	PFUnDA	2058-94-8	28.56	0.0413	0.0413	0.0435	0.185		L
	PFDODA	307-55-1	9.57	0.0139	0.0139	0.0430	0.185		L
	PFTriDA	72629-94-8	14.32	0.0207	0.0207	0.0674	0.185		L
	PFTeDA	376-06-7	ND	ND	ND	0.0751	0.185		U
									U
Sulfonates	PFBS	375-73-5	ND	ND	ND	0.0751	0.185		U
	PFPeS	2706-91-4	396.90	0.574	0.574	0.0896	0.185		
	PFFhS	355-46-4	2580.95	3.74	3.74	0.0748	0.185		
	PFFpS	375-92-8	145.67	0.211	0.211	0.0705	0.185		
	PFOS	1763-23-1	7819.97	11.3	11.3	0.0426	0.185		
	PFNS	68259-12-1	ND	ND	ND	0.0592	0.185		U
	PFDS	335-77-3	ND	ND	ND	0.122	0.185		U
	4:2 FTS	757124-72-4	ND	ND	ND	0.0584	0.185		U
	6:2 FTS	27619-97-2	ND	ND	ND	0.0654	0.185		U
	8:2 FTS	39108-34-4	ND	ND	ND	0.0515	0.185		U
other	PFOSA	754-91-6	ND	ND	ND	0.330	0.331		U
	N-MeFOSAA	2355-31-9	ND	ND	ND	0.0492	0.185		U
	N-EiFOSAA	2991-50-6	129.05	0.187	0.187	0.0589	0.185		
	HFPO-DA	13252-13-6	10534.87	15.2	15.2	0.0861	0.185		
	PFMOAA	674-13-5	78961.86	114	114	1.34	1.34		
	PFMOPrA	377-73-1	ND	ND	ND	0.217	0.185		U
	PFO2HxA	39492-88-1	8030.08	11.6	11.6	1.34	1.34		U
	PFO3OA	39492-89-2	12875.40	18.6	18.6	1.34	1.34		
	PFO4DA	39492-90-5	ND	ND	ND	1.34	1.34		U
	Nafion Byproduct 1	29311-67-9	ND	ND	ND	0.217	0.185		U
	ADONA	919005-14-4	ND	ND	ND	0.109	0.185		U
	9Cl-PF3ONS	756426-58-1	ND	ND	ND	0.109	0.185		U
	11Cl-PF3OUdS	763051-92-9	ND	ND	ND	0.109	0.185		U
	10:2 FTS	120226-60-0	ND	ND	ND	0.217	0.185		U
	FBSA	30334-69-1	205.24	0.297	0.297	0.217	0.185		
	N-EiFOSA	4151-50-2	ND	ND	ND	0.217	0.185		U
	N-EiFOSE	1691-99-2	ND	ND	ND	6.51	6.51		U
	N-MeFOSA	31506-32-8	ND	ND	ND	0.217	0.185		U
	N-MeFOSE	24448-09-7	ND	ND	ND	6.51	6.51		U
	Nafion Byproduct 2	749836-20-2	811.05	1.17	1.17	1.34	1.34		L
	NFDHA	151772-58-6	ND	ND	ND	0.217	0.185		U
	PEPA		11357.06	16.4	16.4	1.34	1.34		
	PFECA-G	801212-59-9	ND	ND	ND	1.34	1.34		U
	PFEEA	113507-82-7	ND	ND	ND	0.217	0.185		U
	PFFhDA	67905-19-5	ND	ND	ND	1.34	1.34		U
	PFMOBA	863090-89-5	ND	ND	ND	1.34	1.34		U
	PFO5DA	39492-91-6	ND	ND	ND	2.72	2.72		U
	PMPA	13140-29-9	13455.80	19.5	19.5	1.34	1.34		
ES	MPFBA		5150.03	7.45				32.4%	
	M5PFPeA		11750.62	17.0				70.1%	
	M3PFBS		18362.92	26.6				108.5%	
	M2-4:2 FTS		42909.00	62.1				263.1%	Q
	M5PFHxA		4741.15	6.86				103.5%	
	M3HFPO-DA		5088.03	7.36				108.7%	
	M4PFHpA		4805.00	6.95				102.2%	
	M3PFHxS		5529.37	8.00				113.2%	
	M2-6:2 FTS		19813.05	28.7				126.4%	
	M8PFOA		5041.88	7.30				105.7%	
	M9PFNA		4769.58	6.90				100.4%	
	M8PFOS		4713.80	6.82				95.3%	
	M2-8:2 FTS		4821.02	6.98				106.5%	
	M8FOSA-I		2967.11	4.29				60.3%	
	M6PFDA		4649.62	6.73				99.9%	
	d3-N-MeFOSAA		4837.18	7.00				100.7%	
	d5-N-EiFOSAA		4707.29	6.81				95.2%	
	M7PFUDa		4607.18	6.67				102.8%	
	MPFDoA		4170.02	6.04				98.8%	
	M2PFTeDA		3548.37	5.14				85.8%	

QC Data

Enthalpy Analytical

Job No.: 0720-783 PFAS by Isotope Dilution (non-potable water)

County of Brunswick Site: N.W. Lab

Enthalpy ID	MB-11040-PFAS	Prep Batch	EU11040	Sample Vol (mL)	250
Sample Name	MB-11040-PFAS	Prep Date	2020-07-27	Extract Vol (mL)	0.4
Matrix		Analysis Date	2020-07-28	Dilution Factor	1
Sampling Date					

	Compound	CAS	Extract Concentration ng/L	Sample Concentration ng/L	Formatted Result ng/L	LOD ng/L	LOQ ng/L	Recovery	Flags
Acids	PFBA	375-22-4	ND	ND	ND	0.157	0.205		U
	PFPeA	2706-90-3	ND	ND	ND	0.0898	0.205		U
	PFHxA	307-24-4	ND	ND	ND	0.158	0.205		U
	PFHpA	375-85-9	ND	ND	ND	0.0695	0.205		U
	PFOA	335-67-1	119.78	0.192	0.192	0.0795	0.205		J
	PFNA	375-95-1	ND	ND	ND	0.0509	0.205		U
	PFDA	335-76-2	ND	ND	ND	0.125	0.205		U
	PFUnDA	2058-94-8	ND	ND	ND	0.0481	0.205		U
	PFDoDA	307-55-1	ND	ND	ND	0.0475	0.205		U
	PFTriDA	72629-94-8	ND	ND	ND	0.0745	0.205		U
	PFTeDA	376-06-7	ND	ND	ND	0.0830	0.205		U
Sulfonates	PFBS	375-73-5	ND	ND	ND	0.0830	0.205		U
	PFPeS	2706-91-4	ND	ND	ND	0.0990	0.205		U
	PFHxS	355-46-4	ND	ND	ND	0.0827	0.205		U
	PFHpS	375-92-8	ND	ND	ND	0.0779	0.205		U
	PFOS	1763-23-1	ND	ND	ND	0.0471	0.205		U
	PFNS	68259-12-1	ND	ND	ND	0.0654	0.205		U
	PFDS	335-77-3	ND	ND	ND	0.135	0.205		U
	4:2 FTS	757124-72-4	ND	ND	ND	0.0646	0.205		U
	6:2 FTS	27619-97-2	ND	ND	ND	0.0723	0.205		U
	8:2 FTS	39108-34-4	ND	ND	ND	0.0569	0.205		U
other	PFOSA	754-91-6	ND	ND	ND	0.365	0.366		U
	N-MeFOSAA	2355-31-9	ND	ND	ND	0.0544	0.205		U
	N-EiFOSAA	2991-50-6	ND	ND	ND	0.0651	0.205		U
	HFPO-DA	13252-13-6	ND	ND	ND	0.0951	0.205		U
	PFMOAA	674-13-5	ND	ND	ND	1.48	1.48		U
	PFMOPrA	377-73-1	ND	ND	ND	0.240	0.205		U
	PFO2HxA	39492-88-1	ND	ND	ND	1.48	1.48		U
	PFO3OA	39492-89-2	ND	ND	ND	1.48	1.48		U
	PFO4DA	39492-90-5	ND	ND	ND	1.48	1.48		U
	Nafion Byproduct 1	29311-67-9	ND	ND	ND	0.240	0.205		U
	ADONA	919005-14-4	ND	ND	ND	0.120	0.205		U
	9Cl-PF3ONS	756426-58-1	ND	ND	ND	0.120	0.205		U
	11Cl-PF3OUdS	763051-92-9	ND	ND	ND	0.120	0.205		U
	10:2 FTS	120226-60-0	ND	ND	ND	0.240	0.205		U
	FBSA	30334-69-1	ND	ND	ND	0.240	0.205		U
	N-EiFOSA	4151-50-2	ND	ND	ND	0.240	0.205		U
	N-EiFOSE	1691-99-2	ND	ND	ND	7.20	7.20		U
	N-MeFOSA	31506-32-8	ND	ND	ND	0.240	0.205		U
	N-MeFOSE	24448-09-7	ND	ND	ND	7.20	7.20		U
	Nafion Byproduct 2	749836-20-2	ND	ND	ND	1.48	1.48		U
	NFDHA	151772-58-6	ND	ND	ND	0.240	0.205		U
	PEPA		ND	ND	ND	1.48	1.48		U
	PFECA-G	801212-59-9	ND	ND	ND	1.48	1.48		U
	PFEEA	113507-82-7	ND	ND	ND	0.240	0.205		U
	PFHxDA	67905-19-5	ND	ND	ND	1.48	1.48		U
	PFMOBA	863090-89-5	ND	ND	ND	1.48	1.48		U
	PFO5DA	39492-91-6	ND	ND	ND	3.01	3.01		U
	PMPA	13140-29-9	ND	ND	ND	1.48	1.48		U
ES	MPFBA		5223.15	8.36				103.8%	
	M5PFPeA		5152.38	8.24				97.2%	
	M3PFBS		4810.40	7.70				89.9%	
	M2-4:2 FTS		5603.48	8.97				108.7%	
	M5PFHxA		5503.85	8.81				100.0%	
	M3HFPO-DA		5934.72	9.50				105.5%	
	M4PFHpA		5375.47	8.60				95.1%	
	M3PFHxS		5733.22	9.17				93.7%	
	M2-6:2 FTS		4888.06	7.82				98.6%	
	M8PFOA		5421.32	8.67				94.6%	
	M9PFNA		5367.03	8.59				94.0%	
	M8PFOS		5026.54	8.04				81.1%	
	M2-8:2 FTS		5088.27	8.14				89.7%	
	M8FOSA-I		3717.46	5.95				60.3%	
	M6PFDA		5381.14	8.61				94.8%	
	d3-N-MeFOSAA		5460.60	8.74				90.7%	
	d5-N-EiFOSAA		5224.76	8.36				84.3%	
	M7PFUDa		5097.81	8.16				93.3%	
	MPFDoA		4145.38	6.63				80.5%	
	M2PFTeDA		2802.40	4.48				55.5%	

Enthalpy Analytical

Job No.: 0720-783 PFAS by Isotope Dilution (non-potable water)

County of Brunswick Site: N.W. Lab

Enthalpy ID OPR-11040-PFAS

Prep Batch EU11040

Sample Vol (mL) 250

Sample Name OPR-11040-PFAS

Prep Date 2020-07-27

Extract Vol (mL) 0.4

Matrix

Analysis Date 2020-07-28

Dilution Factor 1

Sampling Date

	Compound	CAS	Extract Concentration ng/L	Sample Concentration ng/L	Formatted Result ng/L	LOD ng/L	LOQ ng/L	Recovery	Flags
Acids	PFBA	375-22-4	12262.68	19.6	19.6	0.157	0.205	98.1%	
	PFPeA	2706-90-3	11885.31	19.0	19.0	0.0898	0.205	95.1%	
	PFHxA	307-24-4	12195.71	19.5	19.5	0.158	0.205	97.6%	
	PFHpA	375-85-9	12635.18	20.2	20.2	0.0695	0.205	101.1%	
	PFOA	335-67-1	13332.89	21.3	21.3	0.0795	0.205	106.7%	
	PFNA	375-95-1	12302.53	19.7	19.7	0.0509	0.205	98.4%	
	PFDA	335-76-2	12043.17	19.3	19.3	0.125	0.205	96.3%	
	PFUnDA	2058-94-8	11319.53	18.1	18.1	0.0481	0.205	90.6%	
	PFDoDA	307-55-1	11975.00	19.2	19.2	0.0475	0.205	95.8%	
	PFTTrDA	72629-94-8	11155.68	17.8	17.8	0.0745	0.205	89.2%	
	PFTeDA	376-06-7	12534.80	20.1	20.1	0.0830	0.205	100.3%	
Sulfonates	PFBS	375-73-5	10621.48	17.0	17.0	0.0830	0.205	95.8%	
	PFPeS	2706-91-4	11302.13	18.1	18.1	0.0990	0.205	96.1%	
	PFHxS	355-46-4	11252.49	18.0	18.0	0.0827	0.205	98.5%	
	PFHpS	375-92-8	11538.15	18.5	18.5	0.0779	0.205	96.9%	
	PFOS	1763-23-1	10751.27	17.2	17.2	0.0471	0.205	92.7%	
	PFNS	68259-12-1	11537.87	18.5	18.5	0.0654	0.205	95.9%	
	PFDS	335-77-3	11542.15	18.5	18.5	0.135	0.205	95.7%	
	4:2 FTS	757124-72-4	11428.67	18.3	18.3	0.0646	0.205	97.6%	
	6:2 FTS	27619-97-2	9712.57	15.5	15.5	0.0723	0.205	81.7%	
	8:2 FTS	39108-34-4	11354.09	18.2	18.2	0.0569	0.205	94.6%	
Other	PFOSA	754-91-6	11809.25	18.9	18.9	0.365	0.366	94.5%	
	N-MeFOSAA	2355-31-9	12836.52	20.5	20.5	0.0544	0.205	102.7%	
	N-EtFOSAA	2991-50-6	13003.83	20.8	20.8	0.0651	0.205	104.0%	
	HFPO-DA	13252-13-6	12997.44	20.8	20.8	0.0951	0.205	104.0%	
ES	MPFBA		5263.63	8.42				126.9%	
	M5PFPeA		5191.88	8.31				118.9%	
	M3PFBS		4893.65	7.83				111.0%	
	M2-4:2 FTS		4974.95	7.96				117.1%	
	M5PFHxA		5613.06	8.98				122.2%	
	M3HFPO-DA		6074.07	9.72				129.5%	
	M4PFHpA		5334.40	8.54				113.2%	
	M3PFHxS		5728.65	9.17				112.7%	
	M2-6:2 FTS		5756.29	9.21				140.9%	
	M8PFOA		5469.91	8.75				114.4%	
	M9PFNA		5351.72	8.56				112.3%	
	M8PFOS		5712.64	9.14				110.9%	
	M2-8:2 FTS		5787.08	9.26				122.8%	
	M8FOSA-I		5121.67	8.19				100.0%	
	M6PFDA		5147.77	8.24				111.6%	
	d3-N-MeFOSAA		5480.63	8.77				109.6%	
	d5-N-EtFOSAA		5512.37	8.82				107.1%	
	M7PFUDa		5336.98	8.54				120.2%	
	MPFDoA		4786.17	7.66				114.5%	
	M2PFTeDA		3054.63	4.89				74.5%	

Narrative Summary

Enthalpy Analytical Narrative Summary

Company	County of Brunswick
Job No.	0720-783 PFAS by Isotope Dilution (non-potable water)
Client ID.	Site: N.W. Lab

1. Custody

Robin Appelle received the samples on 07/24/20 at 2.1°C after being relinquished by County of Brunswick. The samples were received in good condition.

Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, LLC.

Table 1 - Sample Inventory

EU Lab Sample ID	Client Sample ID	Matrix
0720-783-002-1	072420-EO1	Aqueous
0720-783-001-1	072420-SO1	Aqueous

2. Methods and analytes

A list of analytes of interest and corresponding methods of analysis is shown in Table 3. Abbreviations are defined in the listed Appendices.

Table 3 - Methods and Analytes

EU Method	Analytes	Cleanup Method
EU-047	PFAS (49) list	ENVI-Carb

3. Analysis

The samples were analyzed using Waters Acquity UPLC equipped with Xevo TQ MS (LC/MS/MS "Kili").

For aqueous samples, the sample volume was measured gravimetrically by the laboratory, and spiked with Extraction Standard (ES). The sample was then mixed well and centrifuged.

Cleanup procedures were performed on the supernatant and then extracted via SPE. Each final sample extract was transferred to an autosampler vial and spiked with 80µL of Injection Standard (IS), prior to analysis.



Enthalpy Analytical Narrative Summary

Company	County of Brunswick
Job No.	0720-783 PFAS by Isotope Dilution (non-potable water)
Client ID.	Site: N.W. Lab

4. Calibration

In the initial calibration, the analytes exhibited R^2 of ≥ 0.99 and labeled standards RSDs $< 20\%$. The calibration standard analytes, continuing calibration (concal) and Initial Calibration Verification (ICV) met the 30% criterion for native analytes.

5. QC Notes

The QC sample analyses passed all method criteria.

The samples were extracted within the 28-day from collection holding time and analyzed within the 28-day from extraction to analysis holding time required by the method.

6. Reporting Notes

Some labeled standards in the samples fell outside the limits for ES recoveries. The target analytes are quantified based on their ratio to the labeled standards, therefore, undergo the same losses as the labeled standards. As a result, low or high recoveries do not cause any change to ratios or contribute any additional error in the measurement of the target analytes. Therefore, the data are considered acceptable.

The results presented in this report are representative of the samples as provided to the laboratory.

These analyses met the requirements of the TNI Standard. Any deviations from the requirements of the reference method or TNI Standard have been stated above.

Enthalpy Analytical, LLC in Wilmington NC is accredited by the Louisiana Department of Environmental Quality to the 2009 TNI Standard under certificate number 05075.



General Reporting Notes – Data Qualifiers

The following are general reporting notes that are applicable to all Enthalpy Analytical, LLC - Wilmington, NC data reports, unless specifically noted otherwise.

General Data Qualifiers

- B – The analyte was found in the method blank, at a concentration that was at least 10% of the concentration in the sample.
- Cxx – Two or more congeners co-elute. In EDDs, C denotes the lowest IUPAC congener in a co-elution group and additional co-eluters for the group ('xx') are shown with the number of the lowest IUPAC co-eluter.
- E – The reported concentration exceeds the calibration range (upper point of the calibration curve). For HRMS data, this condition does not imply additional measurement uncertainty. For LC-MS/MS data, these values should be considered as having measurement uncertainty higher than values within the calibration range.
- EDL – Estimated Detection Level. Specific to Dioxin/Furan tests and equivalent to MDL
- EMPC – Estimated Maximum Possible Concentration Specific to Dioxin/Furan tests to indicate the signal/noise ratio was not sufficient for peak identification (the determined ion-abundance ratio was outside the allowed theoretical range), or where there was a co-eluting interference. Indicates that a peak was identified but did not meet the method specified ion-abundance ratio.
- IR – The ion ratio between the primary and secondary ions was observed to be outside the method criteria therefore the actual analyte concentration cannot be accurately determined as defined by DoD QSM Table B-15.
- J – The analyte has a concentration below the minimum calibration level (LOQ value) but greater than the LOD. These values should be considered as having measurement uncertainty higher than values within the calibration range
- L - Indicates that an analyte has a concentration below the Minimum Detection Limit (MDL). The reported concentration is not recommended for regulatory use as the analyte signal may have a signal-to-noise ratio less than the criteria deemed necessary to be considered a detected analyte.
- LOD – Limit of Detection: For reports conforming to the DOD ELAP QSM, this is the QSM-defined LOD. For reports conforming to TNI requirements (but not DOD ELAP QSM requirements), this value is the minimum detection limit (MDL). The LOD is adjusted for sample weight or volume.
- LOQ – Limit of Quantiation: For reports conforming to the DOD ELAP QSM, this is the QSM-defined LOQ. For reports conforming to TNI requirements (but not DOD ELAP QSM requirements), this value is the reporting limit (RL). The LOD is adjusted for sample weight or volume.
- <LOD() – Analyte was not found at a concentration high enough to be reported as detected. It is reported as less than the LOD, and the LOD is given in the parentheses.

General Reporting Notes – Data Qualifiers

- ND – Indicates a non-detect.
- NR – Indicates a value that is not reportable due to issues observed in sample preparation or analysis.
- PR – The associated congener(s) is(are) poorly resolved.
- QI – Indicates the presence of a quantitative interference.
- RL – Reporting Limit. Lowest reportable value. The level is higher than the MDL.
- SI – Denotes “Single Ion Mode” and is utilized for PCBs where the secondary ion trace has a significantly elevated noise level due to background PFK. Responses for such peaks are calculated using an EMPC approach based solely on the primary ion area(s) and may be considered estimates.
- U – The analyte was not detected.
- Q – The labeled standard recovery is not within method control limits.
- X – Results from re-injection/repeat/second-column analysis.

Lab Identifiers/ Data Attributes

- AR – Indicates use of the archived portion of the sample extract.
- CU – Indicates a sample that required additional clean-up prior to HRMS injection/processing.
- D – Dilution Data. Result was obtained from the analysis of a dilution. The number that follows the “D” indicates the dilution factor.
- DE – Indicates a dilution performed with the addition of ES (Extraction Standard) solution.
- DUP – Designation for a duplicate sample.
- MS – Designation for a matrix spike.
- MSD – Designation for a matrix spike duplicate.
- RJ – Indicates a reinjection of the sample extract.
- S – Indicates a sample split. The number that follows the “S” indicates the split factor.
- R – Indicates a re-extraction of the sample.

Brunswick County PFAS Analyte List

	PFAS Analyte	CAS #
*	Perfluoro(2-ethoxyethane)sulphonic acid (PFEESA)	113507-82-7
*	Hexafluoropropylene Oxide Dimer Acid (HFPOA-DA/Gen X)	13252-13-6(b)
*	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	151772-58-6
	Perfluorooctanesulfonate (PFOS)	1763-23-1
	Perfluoroundecanoic acid (PFUdA)	2058-94-8
	N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	2355-31-9
	Perfluoropentanoic acid (PFPeA)	2706-90-3
	Perfluoropentanesulfonate (PFPeS)	2706-91-4
	Fluorotelomer sulfonate 6:2 (6:2 FTS)	27619-97-2
	Perfluorodecanesulfonate (PFDS)	2806-15-7
	Nafion Byproduct 1	29311-67-9
	N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	2991-50-6
	Perfluorohexanoic acid (PFHxA)	307-24-4
	Perfluorododecanoic acid (PFDoA)	307-55-1
	Perfluorooctanoic acid (PFOA)	335-67-1
	Perfluorodecanoic acid (PFDA)	335-76-2
	Perfluorohexanesulfonate (PFHxS)	355-46-4
	Perfluorobutyric acid (PFBA)	375-22-4
	Perfluorobutanesulfonate (PFBS)	375-73-5
	Perfluoroheptanoic acid (PFHpA)	375-85-9
	Perfluoroheptanesulfonate (PFHpS)	375-92-8
	Perfluorononanoic acid (PFNA)	375-95-1
	Perfluorotetradecanoic acid (PFTeDA)	376-06-7
*	Perfluoro-3-methoxypropanoic acid (PFMOPrA)	377-73-1
	Fluorotelomer sulfonate 8:2 (8:2 FTS)	39108-34-4
*	Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	39492-88-1
*	Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	39492-89-2
*	Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	39492-90-5
*	Perfluoro(3,5,7,9,11-pentaoxadodecanoic) acid (PFO5DA)	39492-91-6
	Perfluorononanesulfonate (PFNS)	474511-07-4
*	Perfluoro-2-methoxyacetic acid (PFMOAA)	674-13-5
	Perfluorotridecanoic acid (PFTrDA)	72629-94-8
*	Nafion Byproduct 2	749836-20-2
	Perfluorooctanesulfonamide (PFOSA)	754-91-6
*	9-chlorohexadecafluoro-3-oxanonane-1-sulfonate (9Cl-PF3PONS)	756426-58-1 (d)
	Fluorotelomer sulfonate 4:2 (4:2 FTS)	757124-72-4
*	11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (11Cl-PF3OUdS)	763051-92-9 (c)
*	Perfluoro-4-methoxybutanic acid (PFMOBA)	863090-89-5
	Sodium dodecafluoro-3H-4,8-dioxanonanoate (ADONA)	919005-14-4(e)
*	Perfluoro-2-ethoxypropanoic acid (PEPA)	N/A
*	Perfluoro-2-methoxypropanoic acid (PMPA)	13140-29-9

* Analytes are currently not accredited under TNI Standard for NPW. Accreditation pending.

Sample Custody



Enthalpy Ultratrace Job#: _____ COC Page _____ of _____

Enthalpy Analytical-Wilmington, NC has added enhancements to standard methods to improve accuracy, precision and permit an assessment of laboratory performance in the context of your specific data needs. For more information email Cindy.James@enthalpy.com.

This Chain of Custody is applicable to Non-Air samples. Standard TAT differ per analysis and are provided by request.

Notes:

☐ Iced ☐ Ambient °C

Client Courier, on Ice, no seas, good condition DA 7/12/12

**This Is The Last Page
Of This Report.**