

Pender County

605 E. Fremont Street
Burgaw, NC 28425

Pender County Drinking Water Plant
Samples Received: 07/23/21

Analytical Report
0721-801

Isotope Dilution Method
PFAS



Enthalpy Analytical, LLC – Ultratrace

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Enthalpy Analytical

Job No. 0721-901-1 PFAS by isotope Dilution (non-potable water)

Pender County Site: Pender County Drinking Water Plant

Enthalpy ID	0721-901-001-1	Prep Batch	EU12082	Sample Vol (mL)	277.19
Sample Name	Combined Filter	Prep Date	2021-07-26 15:44	Extract Vol (mL)	0.4
Matrix	Aqueous	Analysis Date	2021-07-28 17:53	Dilution Factor	1
Sampling Date	20210723 00:00	Analyst	reppelle	Method Code	WM-026
Received Date	2021-07-23 10:35	Instrument	KII	Sample Type	Sample

	Compound	CAS	Extract Concentration ng/L	Sample Concentration ng/L	Formatted Result ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags	
Acids	PFBA	375-22-4	2750.01	3.97	3.97	0.138	0.274				
	PFPeA	2706-90-3	6547.34	9.45	9.45	0.153	0.274				
	PFHxA	307-24-4	4716.43	6.80	6.80	0.174	0.274				
	PFHpA	375-85-9	2575.76	3.72	3.72	0.110	0.274				
	PFOA	335-67-1	3940.51	5.69	5.69	0.180	0.274				
	PFNA	375-95-1	828.10	0.908	0.908	0.0886	0.274				
	PFDA	335-76-2	388.08	0.560	0.560	0.0782	0.274				
	PFUnDA	2058-94-8	97.24	0.140	<LOD	0.167	0.274			U	
	PFDoDA	307-55-1	3.32	0.00480	<LOD	0.182	0.274			U	
	PFTeDA	72628-94-8	ND	ND	<LOD	0.138	0.274			U	
	PFTeDA	376-06-7	ND	ND	<LOD	0.197	0.274			U	
	PFBS	375-73-5	3956.73	5.71	5.71	0.320	0.320				
	PFPeS	2706-91-4	440.67	0.638	0.638	0.186	0.258				
	PFHxS	355-46-4	2192.68	3.16	3.16	0.172	0.251				
PFHpS	375-82-8	82.26	0.119	<LOD	0.122	0.261			U		
Sulfonates	PFOS	1783-23-1	6536.50	9.43	9.43	0.144	0.254				
	PFNS	88259-12-1	ND	ND	<LOD	0.0779	0.284			U	
	PFDS	335-77-3	ND	ND	<LOD	0.173	0.264			U	
	4:2 FTS	757124-72-4	ND	ND	<LOD	0.106	0.257			U	
	6:2 FTS	27618-87-2	45.44	0.0656	<LOD	0.105	0.261			U	
	8:2 FTS	39109-34-4	ND	ND	<LOD	0.154	0.263			U	
	PFOSA	754-91-6	86.11	0.0940	<LOD	0.117	0.274			U	
	N-MeFOSAA	2355-31-9	ND	ND	<LOD	0.130	0.274			U	
	N-EFOSAA	2981-60-6	ND	ND	<LOD	0.0993	0.274			U	
	HFPO-DA	13252-13-6	5116.62	7.38	7.38	0.206	0.274			U	
	PFMOAA	674-13-6	35870.99	51.8	51.8	1.30	1.30				
	PFMOPrA	377-73-1	ND	ND	<LOD	0.216	0.274			U	
	PFOzHxA	39482-88-1	4746.97	6.85	6.85	1.30	1.30				
	PFO3OA	39482-88-2	2838.57	4.10	4.10	1.30	1.30				
Other	PFO4DA	39482-80-6	ND	ND	<LOD	1.37	1.37			U	
	Nafion Byproduct 1	29311-87-9	ND	ND	<LOD	0.274	0.274			U	
	ADONA	919005-14-4	ND	ND	<LOD	0.108	0.280			U	
	9Cl-PF3ONS	766426-58-1	ND	ND	<LOD	0.109	0.255			U	
	11Cl-PF3OUdS	763051-92-9	ND	ND	<LOD	0.108	0.258			U	
	10:2 FTS	120226-60-0	ND	ND	<LOD	0.216	0.274			U	
	FBSA	30334-69-1	373.89	0.540	0.540	0.216	0.274			U	
	Nafion Byproduct 2	749836-20-2	184.44	0.266	<LOD	0.274	0.274			U	
	N-EFOSA	4151-50-2	ND	ND	<LOD	0.216	0.274			U	
	N-EFOSE	1681-99-2	ND	ND	<LOD	6.49	6.49			U	
	NFDHA	161772-58-6	ND	ND	<LOD	0.216	0.274			U	
	N-MeFOSA	31506-32-8	ND	ND	<LOD	0.216	0.274			U	
	N-MeFOSE	24449-09-7	ND	ND	<LOD	6.49	6.49			U	
	PEPA	267239-61-2	5895.77	8.22	8.22	1.30	1.30			U	
	PFECa-G	801212-59-9	ND	ND	<LOD	0.274	1.30			U	
	PFEEsA	113507-82-7	ND	ND	<LOD	0.216	0.274			U	
	PFHxDA	57805-18-5	ND	ND	<LOD	1.30	1.30			U	
	PFMOBA	863090-89-5	ND	ND	<LOD	1.30	1.30			U	
	PFOsDA	39482-91-6	ND	ND	<LOD	1.37	1.37			U	
	PMPA	13140-29-9	5856.87	8.45	8.45	1.30	1.30				
	ES	MFPBA		4114.96	5.94				20-150%	82.3%	
		M5PFPeA		10324.83	14.9				20-150%	206.5%	Q
		M3PFBS		16885.42	24.4				20-150%	337.7%	Q
		M2-4:2 FTS		10975.06	15.8				20-150%	219.5%	Q
M5PFHxA			4255.49	6.14				20-150%	85.1%		
M3HFPO-DA			4245.73	6.13				20-150%	94.9%		
M4PFHpA			4514.86	6.52				20-150%	90.3%		
M3PFHxS			4968.93	7.17				20-150%	99.4%		
M2-6:2 FTS			4980.83	7.19				20-150%	89.8%		
M9PFOA			4696.32	6.78				20-150%	93.9%		
M9PFNA			4680.37	6.75				20-150%	83.6%		
M9PFOS			4628.41	6.68				20-150%	82.8%		
M2-8:2 FTS			3954.21	5.71				20-150%	79.1%		
M8FOSA-I			2848.08	4.11				20-150%	57.0%		
M8PFDA			4613.72	6.66				20-150%	92.3%		
d3-N-MeFOSAA			4185.78	6.04				20-150%	83.7%		
d5-N-EFOSAA			4261.22	6.15				20-150%	85.2%		
M7PFUdA			4280.77	6.18				20-150%	86.6%		
MPFDoA		3617.84	5.22				20-150%	72.4%			
M2PFTeDA		2868.94	4.14				20-150%	57.4%			

Enthalpy Analytical

Job No.: 0721-801-1 PFAS by Isotope Dilution (non-potable water)

Pender County Site: Pender County Drinking Water Plant

Enthalpy ID	0721-801-002-1	Prep Batch	EU12082	Sample Vol (mL)	273.95
Sample Name	Pre Clearwell	Prep Date	2021-07-28 16:44	Extract Vol (mL)	0.4
Matrix	Aqueous	Analysis Date	2021-07-28 18:17	Dilution Factor	1
Sampling Date	20210729 00:00	Analyst	rsppelle	Method Code	WM-028
Received Date	2021-07-23 10:35	Instrument	Kii	Sample Type	Sample

	Compound	CAS	Extract Concentration ng/L	Sample Concentration ng/L	Formatted Result ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
Acids	PFBA	375-22-4	2980.53	4.37	4.37	0.140	0.277			
	PFPeA	2706-90-3	4436.10	6.48	6.48	0.155	0.277			
	PFHxA	307-24-4	3774.71	5.51	5.51	0.176	0.277			
	PFHpA	375-85-8	1643.23	2.40	2.40	0.111	0.277			
	PFOA	335-67-1	1469.13	2.19	2.19	0.162	0.277			
	PFNA	375-95-1	124.49	0.182	0.182	0.0894	0.277			J
	PFDA	335-78-2	ND	ND	<LOD	0.0771	0.277			U
	PFUnDA	2056-94-8	ND	ND	<LOD	0.189	0.277			U
	PFOoDA	307-55-1	ND	ND	<LOD	0.184	0.277			U
	PFTrDA	72829-94-8	ND	ND	<LOD	0.138	0.277			U
PFTeDA	376-06-7	ND	ND	<LOD	0.199	0.277			U	
Sulfonates	PFBS	375-73-5	2003.77	2.93	2.93	0.324	0.324			
	PFPeS	2706-91-4	219.59	0.321	0.321	0.188	0.281			
	PFHxS	355-46-4	916.07	1.19	1.19	0.174	0.254			
	PFHpS	375-92-8	ND	ND	<LOD	0.123	0.264			U
	PFOS	1783-23-1	865.05	1.26	1.26	0.148	0.257			
	PFNS	68259-12-1	ND	ND	<LOD	0.0789	0.287			U
	PFDS	335-77-3	ND	ND	<LOD	0.175	0.267			U
	4:2 FTS	757124-72-4	ND	ND	<LOD	0.108	0.260			U
	6:2 FTS	27619-97-2	ND	ND	<LOD	0.106	0.264			U
	8:2 FTS	39108-34-4	ND	ND	<LOD	0.158	0.266			U
Other	PFOSA	754-91-6	ND	ND	<LOD	0.119	0.277			U
	N-MeFOSAA	2365-31-9	ND	ND	<LOD	0.131	0.277			U
	N-EtFOSAA	2991-50-6	ND	ND	<LOD	0.0995	0.277			U
	HFPO-DA	13252-13-6	3052.41	4.46	4.46	0.208	0.277			
	PFMOAA	674-13-5	31179.92	45.5	45.5	1.31	1.31			
	PFMOPrA	377-73-1	99.02	0.130	<LOD	0.219	0.277			U
	PFOzHxA	38482-88-1	7275.54	10.8	10.8	1.31	1.31			
	PFO3OA	39492-89-2	1636.06	2.39	2.39	1.31	1.31			
	PFO4DA	39492-90-5	ND	ND	<LOD	1.39	1.39			U
	Nafion Byproduct 1	29311-87-9	ND	ND	<LOD	0.277	0.277			U
	ADONA	919005-14-4	ND	ND	<LOD	0.110	0.263			U
	9Cl-PF3ONS	756426-58-1	ND	ND	<LOD	0.110	0.258			U
	11Cl-PF3OUdS	763051-82-8	ND	ND	<LOD	0.110	0.261			U
	10:2 FTS	120226-60-0	ND	ND	<LOD	0.219	0.277			U
	FBSA	30334-69-1	99.61	0.144	<LOD	0.219	0.277			U
	Nafion Byproduct 2	748836-20-2	117.05	0.171	<LOD	0.277	0.277			U
	N-EtFOA	4151-50-2	ND	ND	<LOD	0.219	0.277			U
	N-EtFOSE	1691-99-2	ND	ND	<LOD	6.57	6.57			U
	NFDHA	151772-58-6	ND	ND	<LOD	0.218	0.277			U
	N-MeFOA	31506-32-8	ND	ND	<LOD	0.219	0.277			U
N-MeFOSE	24448-09-7	ND	ND	<LOD	6.57	6.57			U	
PEPA	267238-61-2	1795.53	2.62	2.62	1.31	1.31				
PFECa-G	801212-59-9	ND	ND	<LOD	0.277	1.31			U	
PFEEA	113507-82-7	ND	ND	<LOD	0.219	0.277			U	
PFHxDA	67905-19-5	ND	ND	<LOD	1.31	1.31			U	
PFMOBA	863090-89-5	ND	ND	<LOD	1.31	1.31			U	
PFOSDA	39492-91-6	ND	ND	<LOD	1.39	1.39			U	
PMPA	13140-29-9	6043.25	8.82	8.82	1.31	1.31				
ES	MPPFA		4404.92	6.43				20-150%	88.1%	
	M5PPeA		7877.81	11.8				20-150%	158.6%	Q
	M3PFBS		10242.27	15.0				20-150%	204.8%	Q
	M2-4:2 FTS		6847.47	10.1				20-150%	139.9%	
	M5PFHxA		5085.70	7.43				20-150%	101.7%	
	M3HFPO-DA		5586.64	8.13				20-150%	111.3%	
	M4PFHpA		5218.82	7.62				20-150%	104.3%	
	M3PFHxS		5281.66	7.71				20-150%	105.6%	
	M2-8:2 FTS		4093.29	5.99				20-150%	81.9%	
	M8PFOA		4893.77	7.15				20-150%	87.9%	
	M9PFNA		4646.80	6.78				20-150%	92.9%	
	M8PFOS		4185.11	6.11				20-150%	93.7%	
	M2-8:2 FTS		3697.75	5.39				20-150%	73.9%	
	M8FOSA-I		2873.64	4.20				20-150%	57.5%	
	M6PFDA		4336.87	6.33				20-150%	86.7%	
	o3-N-MeFOSAA		3109.70	4.54				20-150%	62.2%	
	d5-N-EtFOSAA		3490.04	5.08				20-150%	69.6%	
	M7PFUdA		3456.07	5.05				20-150%	69.1%	
	MPPDoA		2725.39	3.89				20-150%	54.5%	
	M2PFTeDA		2497.04	3.63				20-150%	49.7%	

Enthalpy Analytical

Job No.: 0721-801-1 PFAS by Isotope Dilution (non-potable water)

Pender County Site: Pender County Drinking Water Plant

Enthalpy ID	0721-801-003-1	Prep Batch	EU12062	Sample Vol (mL)	271.78
Sample Name	Post Clearwell	Prep Date	2021-07-26 15:44	Extract Vol (mL)	0.4
Matrix	Aqueous	Analysis Date	2021-07-28 18:40	Dilution Factor	1
Sampling Date	20210723 00:00	Analyst	rappelle	Method Code	WM-028
Received Date	2021-07-23 10:35	Instrument	Kill	Sample Type	Sample

	Compound	CAS	Extract Concentration: ng/L	Sample Concentration: ng/L	Formatted Result: ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
Acids	PFBA	375-22-4	3103.03	4.67	4.57	0.141	0.280			
	PFPeA	2708-90-3	4443.75	6.54	6.54	0.156	0.280			
	PFHxA	307-24-4	3983.50	5.72	5.72	0.178	0.280			
	PFHpA	376-85-8	1742.78	2.57	2.57	0.112	0.280			
	PFOA	335-67-1	1487.93	2.19	2.19	0.163	0.280			
	PFNA	375-95-1	111.21	0.164	0.164	0.0700	0.280			J
	PFDA	335-78-2	0.64	0.000938	<LOD	0.0777	0.280			U
	PFUnDA	2058-94-9	ND	ND	<LOD	0.170	0.280			U
	PFDoDA	307-55-1	ND	ND	<LOD	0.188	0.280			U
	PFTeDA	72829-94-8	ND	ND	<LOD	0.139	0.280			U
PFToDA	376-06-7	ND	ND	<LOD	0.201	0.280			U	
Sulfonates	PFBS	376-73-5	2282.10	3.37	3.37	0.327	0.327			
	PFPeS	2708-91-4	182.18	0.288	0.288	0.190	0.283			
	PFHxS	355-46-4	965.21	1.27	1.27	0.176	0.256			
	PFHpS	375-92-8	32.39	0.0477	<LOD	0.124	0.288			U
	PFOS	1783-23-1	827.33	1.22	1.22	0.147	0.258			
	PFNS	68258-12-1	ND	ND	<LOD	0.0795	0.269			U
	PFDS	935-77-3	ND	ND	<LOD	0.177	0.269			U
	4:2 FTS	757124-72-4	ND	ND	<LOD	0.109	0.262			U
	6:2 FTS	27618-87-2	27.03	0.0388	<LOD	0.107	0.266			U
	8:2 FTS	39108-34-4	ND	ND	<LOD	0.157	0.288			U
Other	PFOSA	754-81-6	ND	ND	<LOD	0.120	0.280			U
	N-MeFOSAA	2355-31-9	ND	ND	<LOD	0.132	0.280			U
	N-EtFOSAA	2991-50-6	ND	ND	<LOD	0.100	0.280			U
	HFPO-DA	13252-13-8	3133.17	4.61	4.61	0.210	0.280			
	PFMOA	674-13-5	27802.77	40.9	40.9	1.32	1.32			
	PFMOPrA	377-73-1	63.96	0.0941	<LOD	0.221	0.280			U
	PFO2HxA	39492-88-1	7349.27	10.8	10.8	1.32	1.32			
	PFO3OA	39492-89-2	1416.05	2.08	2.08	1.32	1.32			
	PFO4DA	39492-90-5	ND	ND	<LOD	1.40	1.40			U
	Nafion Byproduct 1	29311-67-9	ND	ND	<LOD	0.280	0.280			U
	ADONA	919005-14-4	ND	ND	<LOD	0.110	0.265			U
	9Cl-PF3ONS	756428-58-1	ND	ND	<LOD	0.110	0.261			U
	11Cl-PF3OUdS	763051-82-9	ND	ND	<LOD	0.110	0.263			U
	10:2 FTS	120226-90-0	ND	ND	<LOD	0.221	0.280			U
	FBSA	30334-89-1	121.18	0.178	<LOD	0.221	0.280			U
	Nafion Byproduct 2	748936-20-2	207.18	0.305	0.305	0.280	0.280			
	N-EtFOSA	4161-50-2	ND	ND	<LOD	0.221	0.280			U
	N-EtFOSE	1691-89-2	ND	ND	<LOD	6.62	6.62			U
	NFDHA	151772-88-6	ND	ND	<LOD	0.221	0.280			U
	N-MeFOSA	31508-32-8	ND	ND	<LOD	0.221	0.280			U
N-MeFOSE	24448-08-7	ND	ND	<LOD	6.62	6.62			U	
PEPA	267239-81-2	2303.81	3.39	3.39	1.32	1.32				
PFECa-G	801212-58-8	ND	ND	<LOD	0.280	1.32			U	
PFEEa	113507-82-7	ND	ND	<LOD	0.221	0.280			U	
PFHxDA	67905-18-5	ND	ND	<LOD	1.32	1.32			U	
PFMOBA	883090-88-6	ND	ND	<LOD	1.32	1.32			U	
PFO5DA	39492-91-6	ND	ND	<LOD	1.40	1.40			U	
ES	PMPPA	13140-29-9	4180.07	6.15	6.15	1.32	1.32			
	MPPBA		4675.20	8.88				20-150%	83.5%	
	M5PPeA		9240.24	13.6				20-150%	184.8%	Q
	M3PFBS		11494.86	16.9				20-150%	229.7%	Q
	M2-4:2 FTS		7009.24	10.3				20-150%	140.2%	
	M5PFHxA		4711.17	8.93				20-150%	94.2%	
	M3HFPO-DA		5353.28	7.88				20-150%	107.1%	
	M4PFHpA		4899.66	7.17				20-150%	97.4%	
	M3PFHxS		5109.17	7.52				20-150%	102.2%	
	M2-8:2 FTS		4583.82	6.76				20-150%	91.8%	
	M8PFOA		4729.87	8.96				20-150%	94.9%	
	M8PFNA		4478.65	8.59				20-150%	86.6%	
	M8PFOS		4380.88	6.42				20-150%	87.2%	
	M2-8:2 FTS		3807.42	5.60				20-150%	78.1%	
	M8FOSA-i		3181.06	4.65				20-150%	63.2%	
M8PFDA		4041.93	5.95				20-150%	80.8%		
d3-N-MeFOSAA		3429.34	5.05				20-150%	68.6%		
d5-N-EtFOSAA		2942.54	4.33				20-150%	58.9%		
M7PFUdA		3322.11	4.89				20-150%	66.4%		
MPPDoA		2424.80	3.57				20-150%	48.5%		
M2PFTeDA		1723.50	2.54				20-150%	34.5%		