



Northern Lake Service, Inc • 400 N Lake Ave • Crandon, WI 54520
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March 24, 2023

Mark Pauli
Wisconsin Department of Natural Resources
101 S Webster St
Madison, WI 53707

Project: 2023 Drinking Water Testing - Starks Expanded Area
Project Number: PFAS Private Wells
Work Order: CB02033
Received: 03/03/23

Enclosed are the results of analyses for samples received by our laboratory on 3/3/2023. If you have any questions concerning this report, please feel free to contact a client service representative at clientservices@nlslab.com.

Sincerely,

A handwritten signature in black ink, appearing to read "Tom Priebe".

Tom Priebe For Client Services
Northern Lake Service, Inc.



Wisconsin Department of Natural Resources
101 S Webster St
Madison, WI 53707

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Reported:
3/24/23 9:39

Work Order:
CB02033

Sample Summary

Descriptions of all qualifiers listed throughout this report can be found on the Qualifiers and Definitions Page.

Lab ID	Sample	Matrix	Sample Type	Qualifiers	Date Sampled	Date Received
CB02033-01	QZ882	DW			3/3/23 13:55	3/3/23 15:00
CB02033-02	Field Blank	DW			3/3/23 0:00	3/3/23 15:00

Analysis Qualifiers:

LabNumber	Analysis	Qualifier
CB02033-01	537.1 Perfluorinated Chemicals by LC/MS/MS	InVol
CB02033-01RE1	537.1 Perfluorinated Chemicals by LC/MS/MS	InVol



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Sample Results

Sample: QZ882

CB02033-01 (DW) Sampled: 03/03/23 13:55

Analyte	Result	Qualifier	Dilution	LOD	LOQ	MCL	Units	Date Prepared	Date Analyzed	Analyst	Method	Lab Cert Code
Semi-Volatiles												
11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		1	7.8	25		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	ND		1	8.5	28		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	ND		1	9.2	30		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
hexafluoropropylene oxide dimer acid (HFPO DA)	ND		1	10	35		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1	12	40		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1	10	32		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
perfluorobutanesulfonic acid (PFBS)	ND		1	7.5	25		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
perfluorodecanoic acid (PFDA)	ND		1	8.3	28		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
perfluorododecanoic acid (PFDoA)	ND		1	5.8	19		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
perfluoroheptanoic acid (PFHpA)	6100		20	220	750		ng/L	3/10/23 7:03	3/14/23 10:17	RAW	EPA 537.1, Rev 2.0	2
perfluorohexanoic acid (PFHxA)	5400		20	240	800		ng/L	3/10/23 7:03	3/14/23 10:17	RAW	EPA 537.1, Rev 2.0	2
perfluorohexanesulfonic acid (PFHxS)	89		1	8.5	28		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
perfluorononanoic acid (PFNA)	200		1	12	38		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
perfluorooctanoic acid (PFOA)	23000		20	240	800		ng/L	3/10/23 7:03	3/14/23 10:17	RAW	EPA 537.1, Rev 2.0	2
perfluorooctanesulfonic acid (PFOS)	180		1	7.8	25		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
perfluorotetradecanoic acid (PFTA)	ND		1	8.5	28		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
perfluorotridecanoic acid (PFTrDA)	ND		1	11	35		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
perfluoroundecanoic acid (PFUnA)	ND		1	7.5	25		ng/L	3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
Surrogate: (SURR) C13-PFHxA	100%			Limits: 70-130%				3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
Surrogate: (SURR) C13-HFPODA	98%			Limits: 70-130%				3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
Surrogate: (SURR) C13-PFDA	118%			Limits: 70-130%				3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2
Surrogate: (SURR) d5-NEtFOSAA	91%			Limits: 70-130%				3/10/23 7:03	3/13/23 16:07	RAW	EPA 537.1, Rev 2.0	2

Sample: Field Blank

CB02033-02 (DW) Sampled: 03/03/23 00:00

Analyte	Result	Qualifier	Dilution	LOD	LOQ	MCL	Units	Date Prepared	Date Analyzed	Analyst	Method	Lab Cert Code
Semi-Volatiles												



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Sample Results (Continued)

Sample: Field Blank (Continued)

CB02033-02 (DW) Sampled: 03/03/23 00:00

Analyte	Result	Qualifier	Dilution	LOD	LOQ	MCL	Units	Date Prepared	Date Analyzed	Analyst	Method	Lab Cert Code
Semi-Volatiles (Continued)												
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		1	0.30	0.98		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	ND		1	0.33	1.1		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	ND		1	0.36	1.2		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
hexafluoropropylene oxide dimer acid (HFPO DA)	ND		1	0.40	1.4		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1	0.46	1.6		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1	0.39	1.3		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
perfluorobutanesulfonic acid (PFBS)	ND		1	0.29	0.98		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
perfluorodecanoic acid (PFDA)	ND		1	0.32	1.1		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
perfluorododecanoic acid (PFDoA)	ND		1	0.23	0.75		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
perfluoroheptanoic acid (PFHpA)	ND		1	0.43	1.5		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
perfluorohexanoic acid (PFHxA)	ND		1	0.46	1.6		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
perfluorohexanesulfonic acid (PFHxS)	ND		1	0.33	1.1		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
perfluorononanoic acid (PFNA)	ND		1	0.45	1.5		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
perfluorooctanoic acid (PFOA)	ND		1	0.48	1.6		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
perfluorooctanesulfonic acid (PFOS)	ND		1	0.30	0.98		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
perfluorotetradecanoic acid (PFTA)	ND		1	0.33	1.1		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
perfluorotridecanoic acid (PFTTrDA)	ND		1	0.42	1.4		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
perfluoroundecanoic acid (PFUnA)	ND		1	0.29	0.98		ng/L	3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
Surrogate: (SURR) C13-PFHxA	94%			Limits: 70-130%				3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
Surrogate: (SURR) C13-HFPODA	94%			Limits: 70-130%				3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
Surrogate: (SURR) C13-PFDA	95%			Limits: 70-130%				3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2
Surrogate: (SURR) d5-NEtFOSAA	87%			Limits: 70-130%				3/15/23 7:07	3/17/23 2:21	RAW	EPA 537.1, Rev 2.0	2



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List of Certifications

Code	Description	Number	Expires
2	NLS (Crandon) WDNR Laboratory ID No.	721026460	8/31/23



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Qualifiers and Definitions

Item	Definition
InVol	The initial volume used was 10.
ND	Analyte NOT DETECTED at or above the LOD or MRL.
LOD	Limit of Detection.
LOQ	Limit of Quantitation.
NA	Not Applicable.
Dry	Dry Weight Basis.
Wet	Wet Weight Basis.
% Dry	Equal to: (mg/kg dry) / 10000.
1000 ug/L	Equal to: 1 mg/L.
MCL	Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL.
RPD	Relative Percent Difference.
%REC	Percent Recovery.
Source	Sample that was matrix spiked or duplicated.

All LOD/LOQs adjusted to reflect preparation volumes, dilutions, and/or solids content.

