Northern Lake Service, Inc • 400 N Lake Ave • Crandon, WI 54520
800-278-1254 • www.nlslab.com

March 27, 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: CB02223
Received: 03/08/23

Enclosed are the results of analyses for samples received by our laboratory on 3/8/2023. If you have any questions concerning this report, please feel free to contact a client service representative at clientservices@nlslab.com.

Sincerely,

Tom Priebe For Client Services
Northern Lake Service, Inc.

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Wisconsin Department of Natural Resources	Project: 2023 Drinking Water Testing - Starks Expanded Area		
101 S Webster St	Project Number: PFAS Private Wells	**Reported:**	**Work Order:**
Madison, WI 53707	Project Manager: Mark Pauli	3/27/23 9:54	CB02223

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
CB02223-01	QA080	DW			3/8/23 15:10	3/8/23 16:50
CB02223-02	Field Blank	DW			3/8/23 0:00	3/8/23 16:50

Analysis Qualifiers:

LabNumber	Analysis	Qualifier
CB02223-01	537.1 Perfluorinated Chemicals by LC/MS/MS	InVol
CB02223-01RE1	537.1 Perfluorinated Chemicals by LC/MS/MS	InVol

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Sample Results

Sample: QA080

CB02223-01 (DW) Sampled: 03/08/23 15:10

Analyte	Result	Qualifier	Dilution	LOD	LOQ	MCL	Units	Date Prepared	Date Analyzed	Analyst	Method	Lab Cert Code
Semi-Volatiles												
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		1	7.8	25		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	ND		1	8.5	28		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	ND		1	9.2	30		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
hexafluoropropylene oxide dimer acid (HFPO DA)	ND		1	10	35		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1	12	40		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1	10	32		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
perfluorobutanesulfonic acid (PFBS)	ND		1	7.5	25		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
perfluorodecanoic acid (PFDA)	ND		1	8.3	28		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
perfluorododecanoic acid (PFDoA)	ND		1	5.8	19		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
perfluoroheptanoic acid (PFHpA)	4800		25	280	940		ng/L	3/13/23 7:26	3/17/23 7:56	RAW	EPA 537.1, Rev 2.0	2
perfluorohexanoic acid (PFHxA)	4300		25	290	1000		ng/L	3/13/23 7:26	3/17/23 7:56	RAW	EPA 537.1, Rev 2.0	2
perfluorohexanesulfonic acid (PFHxS)	190		1	8.5	28		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
perfluorononanoic acid (PFNA)	710		1	12	38		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
perfluorooctanoic acid (PFOA)	30000		25	310	1000		ng/L	3/13/23 7:26	3/17/23 7:56	RAW	EPA 537.1, Rev 2.0	2
perfluorooctanesulfonic acid (PFOS)	1600		1	7.8	25		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
perfluorotetradecanoic acid (PFTA)	ND		1	8.5	28		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
perfluorotridecanoic acid (PFTrDA)	ND		1	11	35		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
perfluoroundecanoic acid (PFUnA)	ND		1	7.5	25		ng/L	3/13/23 7:26	3/14/23 17:15	RAW	EPA 537.1, Rev 2.0	2
Surrogate: (SURR) C13-PFHxA	*108%*			*Limits:*	*70-130%*			*3/13/23 7:26*	*3/14/23 17:15*	*RAW*	*EPA 537.1, Rev 2.0*	2
Surrogate: (SURR) C13-HFPODA	*114%*			*Limits:*	*70-130%*			*3/13/23 7:26*	*3/14/23 17:15*	*RAW*	*EPA 537.1, Rev 2.0*	2
Surrogate: (SURR) C13-PFDA	*112%*			*Limits:*	*70-130%*			*3/13/23 7:26*	*3/14/23 17:15*	*RAW*	*EPA 537.1, Rev 2.0*	2
Surrogate: (SURR) d5-NEtFOSAA	*90%*			*Limits:*	*70-130%*			*3/13/23 7:26*	*3/14/23 17:15*	*RAW*	*EPA 537.1, Rev 2.0*	2

Sample: Field Blank

CB02223-02 (DW) Sampled: 03/08/23 00:00

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

Wisconsin Department of Natural Resources	Project: 2023 Drinking Water Testing - Starks Expanded Area		
101 S Webster St	Project Number: PFAS Private Wells	**Reported:**	**Work Order:**
Madison, WI 53707	Project Manager: Mark Pauli	3/27/23 9:54	CB02223

Sample Results (Continued)

Sample: Field Blank (Continued)

CB02223-02 (DW) Sampled: 03/08/23 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	0.31	1.0		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	ND		1	0.34	1.1		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	ND		1	0.37	1.2		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
hexafluoropropylene oxide dimer acid (HFPO DA)	ND		1	0.41	1.4		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1	0.47	1.6		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1	0.40	1.3		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
perfluorobutanesulfonic acid (PFBS)	ND		1	0.30	1.0		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
perfluorodecanoic acid (PFDA)	ND		1	0.33	1.1		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
perfluorododecanoic acid (PFDoA)	ND		1	0.23	0.77		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
perfluoroheptanoic acid (PFHpA)	ND		1	0.44	1.5		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
perfluorohexanoic acid (PFHxA)	ND		1	0.47	1.6		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
perfluorohexanesulfonic acid (PFHxS)	ND		1	0.34	1.1		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
perfluorononanoic acid (PFNA)	ND		1	0.46	1.5		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
perfluorooctanoic acid (PFOA)	ND		1	0.49	1.6		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
perfluorooctanesulfonic acid (PFOS)	ND		1	0.31	1.0		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
perfluorotetradecanoic acid (PFTA)	ND		1	0.34	1.1		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
perfluorotridecanoic acid (PFTrDA)	ND		1	0.43	1.4		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
perfluoroundecanoic acid (PFUnA)	ND		1	0.30	1.0		ng/L	3/20/23 6:51	3/23/23 0:11	RAW	EPA 537.1, Rev 2.0	2
Surrogate: (SURR) C13-PFHxA	*96%*			*Limits:*	*70-130%*			*3/20/23 6:51*	*3/23/23 0:11*	*RAW*	*EPA 537.1, Rev 2.0*	2
Surrogate: (SURR) C13-HFPODA	*92%*			*Limits:*	*70-130%*			*3/20/23 6:51*	*3/23/23 0:11*	*RAW*	*EPA 537.1, Rev 2.0*	2
Surrogate: (SURR) C13-PFDA	*92%*			*Limits:*	*70-130%*			*3/20/23 6:51*	*3/23/23 0:11*	*RAW*	*EPA 537.1, Rev 2.0*	2
Surrogate: (SURR) d5-NEtFOSAA	*87%*			*Limits:*	*70-130%*			*3/20/23 6:51*	*3/23/23 0:11*	*RAW*	*EPA 537.1, Rev 2.0*	2

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101 S Webster St	Project Number: PFAS Private Wells	**Reported:**	**Work Order:**
Madison, WI 53707	Project Manager: Mark Pauli	3/27/23 9:54	CB02223

List of Certifications

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

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Madison, WI 53707	Project Manager: Mark Pauli	3/27/23 9:54	CB02223

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.

CB02223

SAMPLE COLLECTION AND CHAIN OF CUSTODY RECORD

Wisconsin Lab Cert. No. 721026460
WI DATCP 105-000330

CLIENT	WISCONSIN DNR-DRINKING AND GROUNDWATER
ADDRESS	PO Box 7921, DG/5
CITY	MADISON
STATE	WI
ZIP	53707
PROJECT DESCRIPTION / NO.	PFAS PRIVATE WELLS
QUOTATION NO.	
DNR FID #	
DNR LICENSE #	
CONTACT	MARK PAULI
PHONE	715-499-0612
PURCHASE ORDER NO.	0000022899
FAX	

MATRIX:
SW = surface water
WW = waste water
GW = groundwater
DW = drinking water
TIS = tissue
AIR = air
SOIL = soil
SED = sediment
PROD = product
SL = sludge
OTHER

ANALYZE PER ORDER OF ANALYSIS: EPA METHOD 537.1

USE BOXES BELOW: Indicate Y or N if GW Sample is field filtered.
Indicate G or C if WW Sample is Grab or Composite.

NO.

ITEM NO.	NLS LAB NO.	SAMPLE ID	COLLECTION DATE	COLLECTION TIME	MATRIX (See above)												COLLECTION REMARKS (i.e. DNR Well ID #)
1.		QA080	3/8/23	15:10	GW		X										(2) SAMPLE (1) FB
2.																	
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

COLLECTED BY (signature)	William Roberts	DATE/TIME 3-8-23 15:10
RELINQUISHED BY (signature)	William Roberts	RECEIVED BY (signature) DATE/TIME 3-8-23 16:50
DISPATCHED BY (signature)	METHOD OF TRANSPORT	DATE/TIME

CUSTODY SEAL NO. (IF ANY)

REPORT TO

INVOICE TO

RECEIVED AT NLS BY (signature)	DATE/TIME 3/8/23 1650	CONDITION	TEMP 0.4
COOLER #	REMARKS & OTHER INFORMATION		
	WDNR FACILITY NUMBER	E-MAIL ADDRESS	

PRESERVATIVE:
NP = no preservative
S = sulfuric acid
N = nitric acid
Z = zinc acetate
M = methanol
OH = sodium hydroxide
HA = hydrochloric & ascorbic acid
H = hydrochloric acid

IMPORTANT:
1. TO MEET REGULATORY REQUIREMENTS, THIS FORM MUST BE COMPLETED IN DETAIL AND INCLUDED IN THE COOLER CONTAINING THE SAMPLES DESCRIBED.
2. PLEASE USE ONE LINE PER SAMPLE, NOT PER BOTTLE.
3. RETURN THIS FORM WITH SAMPLES - CLIENT MAY KEEP PINK COPY.
4. PARTIES COLLECTING SAMPLE, LISTED AS REPORT TO AND LISTED AS INVOICED TO AGREE TO STANDARD TERMS & CONDITIONS ON REVERSE.