



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: CB02224
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,

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

Project: 2023 Drinking Water Testing - Starks Expanded Area
Project Number: PFAS Private Wells
Project Manager: Mark Pauli

Reported:
3/27/23 9:54

Work Order:
CB02224

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 |
|------------|-------------|--------|-------------|------------|--------------|---------------|
| CB02224-01 | QA079 | DW | | | 3/8/23 14:20 | 3/8/23 16:50 |
| CB02224-02 | Field Blank | DW | | | 3/8/23 0:00 | 3/8/23 16:50 |



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Sample Results

Sample: QA079

CB02224-01 (DW) Sampled: 03/08/23 14:20

| 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 | 0.32 | 1.0 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS) | ND | | 1 | 0.35 | 1.1 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| 4,8-dioxa-3H-perfluorononanoic acid (ADONA) | ND | | 1 | 0.39 | 1.2 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| hexafluoropropylene oxide dimer acid (HFPO DA) | ND | | 1 | 0.43 | 1.5 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA) | ND | | 1 | 0.49 | 1.7 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND | | 1 | 0.42 | 1.4 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorobutanesulfonic acid (PFBS) | 13 | | 1 | 0.31 | 1.0 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorodecanoic acid (PFDA) | ND | | 1 | 0.34 | 1.1 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorododecanoic acid (PFDoA) | ND | | 1 | 0.24 | 0.80 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluoroheptanoic acid (PFHpA) | 1.0 | J | 1 | 0.46 | 1.6 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorohexanoic acid (PFHxA) | 1.2 | J | 1 | 0.49 | 1.7 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorohexanesulfonic acid (PFHxS) | 1.1 | | 1 | 0.35 | 1.1 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorononanoic acid (PFNA) | ND | | 1 | 0.48 | 1.6 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorooctanoic acid (PFOA) | 3.4 | | 1 | 0.51 | 1.7 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorooctanesulfonic acid (PFOS) | 0.96 | J | 1 | 0.32 | 1.0 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorotetradecanoic acid (PFTA) | ND | | 1 | 0.35 | 1.1 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorotridecanoic acid (PFTrDA) | ND | | 1 | 0.45 | 1.5 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluoroundecanoic acid (PFUnA) | ND | | 1 | 0.31 | 1.0 | | ng/L | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| Surrogate: (SURRE) C13-PFHxA | 97% | | | Limits: 70-130% | | | | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| Surrogate: (SURRE) C13-HFPODA | 97% | | | Limits: 70-130% | | | | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| Surrogate: (SURRE) C13-PFDA | 95% | | | Limits: 70-130% | | | | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |
| Surrogate: (SURRE) d5-NEtFOSAA | 85% | | | Limits: 70-130% | | | | 3/13/23 7:26 | 3/14/23 18:09 | RAW | EPA 537.1, Rev 2.0 | 2 |

Sample: Field Blank

CB02224-02 (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 | | | | | | | | | | | | |



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Sample Results (Continued)

Sample: Field Blank (Continued)

CB02224-02 (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 | 3/22/23 23:45 | 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 | 3/22/23 23:45 | 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 | 3/22/23 23:45 | 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 | 3/22/23 23:45 | 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 | 3/22/23 23:45 | 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 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorobutanesulfonic acid (PFBS) | ND | | 1 | 0.30 | 1.0 | | ng/L | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorodecanoic acid (PFDA) | ND | | 1 | 0.33 | 1.1 | | ng/L | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorododecanoic acid (PFDoA) | ND | | 1 | 0.23 | 0.77 | | ng/L | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluoroheptanoic acid (PFHpA) | ND | | 1 | 0.44 | 1.5 | | ng/L | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorohexanoic acid (PFHxA) | ND | | 1 | 0.47 | 1.6 | | ng/L | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorohexanesulfonic acid (PFHxS) | ND | | 1 | 0.34 | 1.1 | | ng/L | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorononanoic acid (PFNA) | ND | | 1 | 0.46 | 1.5 | | ng/L | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorooctanoic acid (PFOA) | ND | | 1 | 0.49 | 1.6 | | ng/L | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorooctanesulfonic acid (PFOS) | ND | | 1 | 0.31 | 1.0 | | ng/L | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorotetradecanoic acid (PFTA) | ND | | 1 | 0.34 | 1.1 | | ng/L | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluorotridecanoic acid (PFTTrDA) | ND | | 1 | 0.43 | 1.4 | | ng/L | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| perfluoroundecanoic acid (PFUnA) | ND | | 1 | 0.30 | 1.0 | | ng/L | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| Surrogate: (SURR) C13-PFHxA | 97% | | | Limits: 70-130% | | | | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| Surrogate: (SURR) C13-HFPODA | 93% | | | Limits: 70-130% | | | | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| Surrogate: (SURR) C13-PFDA | 93% | | | Limits: 70-130% | | | | 3/20/23 6:51 | 3/22/23 23:45 | RAW | EPA 537.1, Rev 2.0 | 2 |
| Surrogate: (SURR) d5-NEtFOSAA | 89% | | | Limits: 70-130% | | | | 3/20/23 6:51 | 3/22/23 23:45 | 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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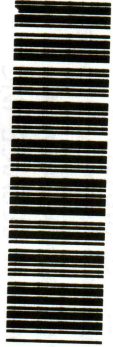
Work Order:
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Qualifiers and Definitions

| Item | Definition |
|-----------|--|
| J | Result is between LOD and LOQ and considered to be within a region of less-certain quantitation. |
| 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: $(\text{mg/kg dry}) / 10000$. |
| 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.

CB02224



NORT Analytical
400 North
Tel: (715)

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, D615
 CITY: MADISON STATE: WI ZIP: 53707
 PROJECT DESCRIPTION / NO.: PHAS 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 _____

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

ANALYZE PER ORDER OF ANALYSIS

| ITEM NO. | SAMPLE ID | DATE | TIME | MATRIX (See above) | COLLECTION | NO. | COLLECTION REMARKS (i.e. DNR Well ID #) |
|----------|-----------|--------|-------|--------------------|------------|-----|---|
| 1. | QA079 | 3/8/23 | 14:20 | GW | X | | 2) JAWOKES (1) FB |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. | | | | | | | |
| 7. | | | | | | | |
| 8. | | | | | | | |
| 9. | | | | | | | |
| 10. | | | | | | | |

REPORT TO _____
 INVOICE TO _____

COLLECTED BY (signature) *William Robert* CUSTODY SEAL NO. (IF ANY) 3-8-23 DATE/TIME 14:20
 RELINQUISHED BY (signature) *William Robert* RECEIVED BY (signature) 3-8-23 DATE/TIME 16:50
 DISPATCHED BY (signature) _____ METHOD OF TRANSPORT _____

RECEIVED AT NLS BY (signature) *[Signature]* DATE/TIME 3/8/23 16:50 CONDITION _____ TEMP 0.4
 REMARKS & OTHER INFORMATION _____
 WDNR FACILITY NUMBER _____ E-MAIL ADDRESS _____

COOLER # _____
 PRESERVATIVE: N = nitric acid OI = sodium hydroxide
 Z = zinc acetate HA = hydrochloric & ascorbic acid
 M = methanol H = hydrochloric acid
 S = sulfuric acid
 NI* = no preservative
 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.

IMPORTANT!