**Pace Analytical Services, LLC**
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

May 24, 2022

Rich Ellman
Full Service Organics Management LLC
3631 County Road C
Oconto Falls, WI 54154

RE: Project: MUNISING, MI - PFAS
Pace Project No.: 40243698

Dear Rich Ellman:

Enclosed are the analytical results for sample(s) received by the laboratory on April 20, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Christopher Hyska

Christopher Hyska
christopher.hyska@pacelabs.com
(920)469-2436
Project Manager

Enclosures

**Pace Analytical Services, LLC**
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

## CERTIFICATIONS

Project: MUNISING, MI - PFAS
Pace Project No.: 40243698

**Pace Analytical Services, LLC - Minneapolis MN**

1700 Elm Street SE, Minneapolis, MN 55414
A2LA Certification #: 2926.01*
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification (A2LA) #: R-036
North Dakota Certification (MN) #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Ohio VAP Certification (1800) #: CL110*
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

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## SAMPLE SUMMARY

Project: MUNISING, MI - PFAS
Pace Project No.: 40243698

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **40243698001** | **MUNISING BIOSOLIDS** | Solid | 04/19/22 17:00 | 04/20/22 14:15 |

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## SAMPLE ANALYTE COUNT

Project: MUNISING, MI - PFAS
Pace Project No.: 40243698

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| **40243698001** | **MUNISING BIOSOLIDS** | ASTM D2974 | JDL | 1 | PASI-M |

PASI-M = Pace Analytical Services - Minneapolis

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## ANALYTICAL RESULTS

Project: MUNISING, MI - PFAS
Pace Project No.: 40243698

**Sample: MUNISING BIOSOLIDS** **Lab ID: 40243698001** Collected: 04/19/22 17:00 Received: 04/20/22 14:15 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **Dry Weight / %M by ASTM D2974** | Analytical Method: ASTM D2974<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Percent Moisture | **95.7** | % | 0.10 | 0.10 | 1 | | 04/26/22 12:06 | | N2 |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1241 Bellevue Street - Suite 9
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(920)469-2436

## QUALITY CONTROL DATA

Project: MUNISING, MI - PFAS
Pace Project No.: 40243698

QC Batch: 811324
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight / %M by ASTM D2974
Laboratory: Pace Analytical Services - Minneapolis

Associated Lab Samples: 40243698001

SAMPLE DUPLICATE: 4303855

| Parameter | Units | 10605480002 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Percent Moisture | % | 15.4 | 15.6 | 1 | 30 | N2 |

SAMPLE DUPLICATE: 4303856

| Parameter | Units | 10605460010 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Percent Moisture | % | 13.6 | 14.5 | 6 | 30 | N2 |

**Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.**

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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# QUALIFIERS

Project: MUNISING, MI - PFAS
Pace Project No.: 40243698

## DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## ANALYTE QUALIFIERS

| | |
|---|---|
| N2 | The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request. |

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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: MUNISING, MI - PFAS
Pace Project No.: 40243698

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **40243698001** | **MUNISING BIOSOLIDS** | ASTM D2974 | 811324 | | |

(Please Print Clearly)

| | |
|---|---|
| Company Name: | FSO Management |
| Branch/Location: | - |
| Project Contact: | Rich Ellman |
| Phone: | 920-373-6704 |
| Project Number: | - |
| Project Name: | Munising, MI - PFAS |
| Project State: | MI |
| Sampled By (Print): | Rich Ellman |
| Sampled By (Sign): | |
| PO #: | - |
| Regulatory Program: | MI EGLE |

Pace Analytical®
www.pacelabs.com

UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436



COC No. 10243698

# CHAIN OF CUSTODY

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

| | |
|---|---|
| Quote #: | N/A |
| Mail To Contact: | Rich Ellman |
| Mail To Company: | FSO Management LLC. |
| Mail To Address: | 3631 County Rd C<br>Oconto Falls, WI 54154 |
| Invoice To Contact: | Rich Ellman |
| Invoice To Company: | FSO Management LLC. |
| Invoice To Address: | 3631 County Rd C<br>Oconto Falls, WI 54154 |
| Invoice To Phone: | 920-373-6704 |

**Data Package Options** (billable)
- ☐ EPA Level III
- ☐ EPA Level IV

**MS/MSD**
- ☐ On your sample (billable)
- ☐ NOT needed on your sample

**Matrix Codes**

| | |
|---|---|
| A = Air | W = Water |
| B = Biota | DW = Drinking Water |
| C = Charcoal | GW = Ground Water |
| O = Oil | SW = Surface Water |
| S = Soil | WW = Waste Water |
| Sl = Sludge | WP = Wipe |

| PACE LAB # | CLIENT FIELD ID | COLLECTION DATE | COLLECTION TIME | MATRIX | FILTERED? (YES/NO) Y/N | PRESERVATION (CODE)* Pick Letter | Analyses Requested: PFAS 537- MI EGLE 28 lis | CLIENT COMMENTS | LAB COMMENTS (Lab Use Only) | Profile # 6784 |
|---|---|---|---|---|---|---|---|---|---|---|
| 001 | Munising Biosolids | 4-19 | 5000 | SL | N | A | X | | | |

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):

| | |
|---|---|
| Email #1: | rellman@fsomanagement.com |
| Email #2: | |
| Telephone: | |
| Fax: | |

Samples on HOLD are subject to special pricing and release of liability

| Relinquished By: | Date/Time: | Received By: | Date/Time: |
|---|---|---|---|
| Rich Ellman | 420 - 2:15 | Anthony Herold | 4/20/22 1415 |
| | | | |
| | | | |
| | | | |
| | | | |

PACE Project No. 10243698

Receipt Temp = 4.8 °C

Sample Receipt pH OK / Adjusted

Cooler Custody Seal Present / Not Present
Intact / Not Intact



Version 6.0 06/14/06

C019a(27Jun2006)

# Sample Preservation Receipt Form

Client Name: FSO management Project # WO# 36948

All containers needing preservation have been checked and noted below: ☐Yes ☐No ☒N/A 4/20/23 MP

Lab Lot# of pH paper: Lab Std #ID of preservation (if pH adjusted):

| Pace Lab # | Glass: AG1U | BG1U | AG1H | AG4S | AG4U | AG5U | AG2S | BG3U | Plastic: BP1U | BP3U | BP3B | BP3N | BP3S | Vials: VG9A | DG9T | VG9U | VG9H | VG9M | VG9D | Jars: JGFU | JG9U | WGFU | WPFU | General: SP5T | ZPLC | GN | VOA Vials (>6mm) * | H2SO4 pH ≤2 | NaOH+Zn Act pH ≥9 | NaOH pH ≥12 | HNO3 pH ≤2 | pH after adjusted | Volume (mL) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | 2.5 / 5 / 10 |
| 002 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 003 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 004 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 005 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 006 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 007 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 008 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 009 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 010 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 011 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 012 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 014 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 015 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 016 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 017 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 018 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 019 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 020 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |

4/20/23 MP

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : ☐Yes ☐No ☒N/A *If yes look in headspace column

| | |
|---|---|
| AG1U | 1 liter amber glass |
| BG1U | 1 liter clear glass |
| AG1H | 1 liter amber glass HCL |
| AG4S | 125 mL amber glass H2SO4 |
| AG4U | 120 mL amber glass unpres |
| AG5U | 100 mL amber glass unpres |
| AG2S | 500 mL amber glass H2SO4 |
| BG3U | 250 mL clear glass unpres |

| | |
|---|---|
| BP1U | 1 liter plastic unpres |
| BP3U | 250 mL plastic unpres |
| BP3B | 250 mL plastic NaOH |
| BP3N | 250 mL plastic HNO3 |
| BP3S | 250 mL plastic H2SO4 |

| | |
|---|---|
| VG9A | 40 mL clear ascorbic |
| DG9T | 40 mL amber Na Thio |
| VG9U | 40 mL clear vial unpres |
| VG9H | 40 mL clear vial HCL |
| VG9M | 40 mL clear vial MeOH |
| VG9D | 40 mL clear vial DI |

| | |
|---|---|
| JGFU | 4 oz amber jar unpres |
| JG9U | 9 oz amber jar unpres |
| WGFU | 4 oz clear jar unpres |
| WPFU | 4 oz plastic jar unpres |
| SP5T | 120 mL plastic Na Thiosulfate |
| ZPLC | ziploc bag |
| GN | 125mL poly unpres. |

# Sample Condition Upon Receipt Form (SCUR)

Project #:

**WO# : 40243698**

40243698

**Client Name:** FSO Management

**Courier:** ☐ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco ☒ Client ☐ Pace Other:

**Tracking #:**

**Custody Seal on Cooler/Box Present:** ☐ yes ☒ no Seals intact: ☐ yes ☐ no

**Custody Seal on Samples Present:** ☐ yes ☒ no Seals intact: ☐ yes ☐ no

**Packing Material:** ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other

**Thermometer Used** SR - 107 **Type of Ice:** (Wet) Blue Dry None ☒ Samples on ice, cooling process has begun

**Cooler Temperature** Uncorr: 4.5 /Corr: 4.8

**Temp Blank Present:** ☒ yes ☐ no 4/20/22 AL **Biological Tissue is Frozen:** ☐ yes ☐ no

Person examining contents:
Date: 4/20/22 Initials: MP

Labeled By Initials: AL

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

| | | |
|---|---|---|
| Chain of Custody Present: | ☒Yes ☐No ☐N/A | 1. |
| Chain of Custody Filled Out: | ☒Yes ☐No ☐N/A | 2. |
| Chain of Custody Relinquished: | ☒Yes ☐No ☐N/A | 3. |
| Sampler Name & Signature on COC: | ☒Yes ☐No ☐N/A | 4. |
| Samples Arrived within Hold Time: | ☒Yes ☐No | 5. |
| - VOA Samples frozen upon receipt | ☐Yes ☐No | Date/Time: |
| **Short Hold Time Analysis (<72hr):** | ☐Yes ☒No | 6. |
| **Rush Turn Around Time Requested:** | ☐Yes ☒No | 7. |
| Sufficient Volume: For Analysis: ☒Yes ☐No MS/MSD: | ☐Yes ☒No ☐N/A | 8. |
| Correct Containers Used: | ☒Yes ☐No | 9. |
| -Pace Containers Used: 4/20/22 AL | ☐Yes ☒No ☐N/A | |
| -Pace IR Containers Used: | ☐Yes ☐No ☒N/A | |
| Containers Intact: | ☒Yes ☐No | 10. |
| Filtered volume received for Dissolved tests | ☐Yes ☐No ☒N/A | 11. |
| Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: 5 | ☒Yes ☐No ☐N/A | 12. |
| Trip Blank Present: | ☐Yes ☐No ☒N/A | 13. |
| Trip Blank Custody Seals Present | ☐Yes ☐No ☒N/A | |
| Pace Trip Blank Lot # (if purchased): | | |

**Client Notification/ Resolution:** If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution:

**PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample login**

Pace Analytical™
www.pacelabs.com

**Pace Analytical Services, LLC.**
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

## Report Prepared for:

Christopher Hyska
PACE Wisconsin
1241 Bellevue Street
Green Bay WI 54302

# REPORT OF LABORATORY ANALYSIS FOR PFAAs

## Report Information:

**Pace Project #: 10605595**
**Sample Receipt Date: 04/22/2022**
**Client Project #: 40243698 Full Service Organics**
**Client Sub PO #: N/A**
**State Cert #: N/A**

### Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PFAA Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

### This report has been reviewed by:

May 24, 2022

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com

**Report Prepared Date:**
May 24, 2022

## Report of Laboratory Analysis

## DISCUSSION

This report presents the results from the analyses performed on one sample submitted by a representative of PACE Wisconsin. The samples were analyzed for twenty-eight perfluorinated compounds using DOD QSM 5.3. Reporting limits were set to quantification limits.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank was free of the target perfluorinated compounds at the reporting limits. This indicates that the sample processing procedures did not significantly contribute to the analyte content determined for the sample material.

A laboratory spike sample was also prepared with the sample batch using clean reference matrix that had been fortified with native standards. The recovery results were within the method limits. This spike indicates that extraction performed as expected. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from that analysis will be provided upon request.

Elevated/Diminished extracted internal standard (EIS) recovery ("R" flagged) were present in the sample and continue calibration verfication, however, the use of the isotope dilution method generally precludes any adverse impact on those individual native compounds that have a directly associated standard.

Sample has elevated EIS recoveries ("R" flagged) for FTS. While the use of the isotope dilution method generally precludes any adverse impact on those individual native compounds that have a directly associated standard, in the case of the FTS compounds, the recoveries are anomalously high, and are adversely impacted by matrix. The results for these native compounds should be considered estimated.

The four injection internal standards (13C4 PFOA, 13C4 PFOS, 13C2_PFDA, and 13C2_PFHxA) pass for each analysis in the batch verifying that the instrument detector is working as expected.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Minnesota Laboratory Certifications

| Authority | Certificate # | Authority | Certificate # |
|---|---|---|---|
| | | Mississippi | MN00064 |
| | | Missouri | 10100 |
| A2LA | 2926.01 | Montana | CERT0092 |
| Alabama | 40770 | Nebraska | NE-OS-18-06 |
| Alaska-DW | MN00064 | Nevada | MN00064 |
| Alaska-UST | 17-009 | New Hampshire | 2081 |
| Arizona | AZ0014 | New Jersey | MN002 |
| Arkansas - WW | 88-0680 | New York | 11647 |
| Arkansas-DW | MN00064 | North Carolina- | 27700 |
| California | 2929 | North Carolina- | 530 |
| Colorado | MN00064 | North Dakota | R-036 |
| Connecticut | PH-0256 | Ohio-DW | 41244 |
| Florida | E87605 | Ohio-VAP (170 | CL101 |
| Georgia | 959 | Ohio-VAP (180 | CL110 |
| Hawaii | MN00064 | Oklahoma | 9507 |
| Idaho | MN00064 | Oregon- rimary | MN300001 |
| Illinois | 200011 | Oregon-Second | MN200001 |
| Indiana | C-MN-01 | Pennsylvania | 68-00563 |
| Iowa | 368 | Puerto Rico | MN00064 |
| Kansas | E-10167 | South Carolina | 74003 |
| Kentucky-DW | 90062 | Tennessee | TN02818 |
| Kentucky-WW | 90062 | Texas | T104704192 |
| Louisiana-DEQ | AI-84596 | Utah | MN00064 |
| Louisiana-DW | MN00064 | Vermont | VT-027053137 |
| Maine | MN00064 | Virginia | 460163 |
| Maryland | 322 | Washington | C486 |
| Michigan | 9909 | West Virginia-D | 382 |
| Minnesota | 027-053-137 | West Virginia-D | 9952C |
| Minnesota-Ag | via MN 027-053 | Wisconsin | 999407970 |
| Minnesota-Petr | 1240 | Wyoming-UST | via A2LA 2926. |

## REPORT OF LABORATORY ANALYSIS

# Appendix A

Sample Management

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Sample ID Cross Reference

| Client Sample ID | Pace Sample ID | Date Received | Sample Type |
|---|---|---|---|
| MUNISING BIOSOLIDS | 40243698001 | 04/22/2022 | Solid |

## REPORT OF LABORATORY ANALYSIS

# Internal Transfer Chain of Custody

Pace Analytical®
www.pacelabs.com

[X] Samples Pre-Logged into eCOC.

**State Of Origin:** MI
**Cert. Needed:** [X] Yes [ ] No
**Owner Received Date:** 4/20/2022 **Results Requested By:** 5/12/2022

**Workorder:** 40243698 **Workorder Name:** MUNISING, MI - PFAS

| Report To | Subcontract To |
|---|---|
| Christopher Hyska<br>Pace Analytical Green Bay<br>1241 Bellevue Street<br>Suite 9<br>Green Bay, WI 54302<br>Phone (920)469-2436 | Pace Analytical Minnesota<br>1700 Elm Street SE<br>Suite 200<br>Minneapolis, MN 55414<br>Phone (612)607-1700 |

| Item | Sample ID | Sample Type | Collected Date/Time | Lab ID | Matrix | Preserved Containers: Unpreserved | Requested Analysis: MI EGLE (28) PFAS by ID | LAB USE ONLY |
|---|---|---|---|---|---|---|---|---|
| 1 | MUNISING BIOSOLIDS | PS | 4/19/2022 17:00 | 40243698001 | Solid | 1 | X | 001 |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |

| Transfers | Released By | Date/Time | Received By | Date/Time |
|---|---|---|---|---|
| 1 | [signature] Pace | 4.21.22 1600 | [signature] / UPS | 4/21/22 12:30 |
| 2 | | | | |
| 3 | | | | |

**Comments:** %M in MN

**Cooler Temperature on Receipt** 4.4, 4.7, 3.6 °C | **Custody Seal** (Y) or N | **Received on Ice** (Y) or N | **Samples Intact** (Y) or N

****In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.*

WO# : 10605595
10605595

| PFAS (analyte) | Cas# |
|---|---|
| 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) | 756426-58-1 |
| 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) | 763051-92-9 |
| 1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS) | 39108-34-4 |
| 1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS) | 27619-97-2 |
| 1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS) | 757124-72-4 |
| Hexafluoropropylene oxide dimer acid (GenX) | 13252-13-6 |
| 4,8-dioxa-3H-perfluorononanoic acid (ADONA) | 919005-14-4 |
| N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA) | 2991-50-6 |
| N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) | 2355-31-9 |
| Perfluoro-1-butanesulfonic acid (PFBS) | 375-73-5 |
| Perfluoro-1-decanesulfonic acid (PFDS) | 335-77-3 |
| Perfluoro-1-heptanesulfonic acid (PFHpS) | 375-92-8 |
| Perfluoro-1-nonanesulfonic acid (PFNS) | 68259-12-1 |
| Perfluoro-1-octanesulfonamide (PFOSA) | 754-91-6 |
| Perfluoro-1-pentanesulfonic acid (PFPeS) | 2706-91-4 |
| Perfluorohexanesulfonic acid (PFHxS) | 355-46-4 |
| Perfluoro-n-butanoic acid (PFBA) | 375-22-4 |
| Perfluoro-n-decanoic acid (PFDA) | 335-76-2 |
| Perfluoro-n-dodecanoic acid (PFDoA) | 307-55-1 |
| Perfluoro-n-heptanoic acid (PFHpA) | 375-85-9 |
| Perfluoro-n-hexanoic acid (PFHxA) | 307-24-4 |
| Perfluoro-n-nonanoic acid (PFNA) | 375-95-1 |
| Perfluoro-n-octanoic acid (PFOA) | 335-67-1 |
| Perfluoro-n-pentanoic acid (PFPeA) | 2706-90-3 |
| Perfluoro-n-tetradecanoic acid (PFTeDA) | 376-06-7 |
| Perfluoro-n-tridecanoic acid (PFTrDA) | 72629-94-8 |
| Perfluoro-n-undecanoic acid (PFUdA) | 2058-94-8 |
| Perfluorooctanesulfonic acid (PFOS) | 1763-23-1 |

# DC#_Title: ENV-FRM-MIN4-0150 v05_Sample Condition Upon Receipt (SCUR)

**Effective Date: 04/12/2022**

**WO# : 10605595**

**PM: SCU** **Due Date: 05/13/22**

**CLIENT: PASI-WI**

Sample Condition Upon Receipt

Client Name: Pace Analytical Green Bay

Project #:

Courier: ☐Fed Ex ☐UPS ☐USPS ☐Client ☑Pace ☐SpeeDee ☐Commercial

See Exceptions ☐ENV-FRM-MIN4-0142

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☑Yes ☐No Seals Intact? ☑Yes ☐No Biological Tissue Frozen? ☐Yes ☐No ☑N/A

Packing Material: ☐Bubble Wrap ☑Bubble Bags ☐None ☑Other: Plastic Bags Temp Blank? ☑Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☐T3(0459) ☐T4(0254) ☐T5(0489) ☑T6(0235) ☐T7(0042) ☐01339252/1710 ☐122639816 ☐140792808

Type of Ice: ☑Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☑No Were All Container Temps Taken? ☐Yes ☐No ☑N/A

Temp should be above freezing to 6°C Cooler Temp Read w/temp blank: 4.7, 4.7, 3.6 °C

Average Corrected Temp (no temp blank only): _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

Correction Factor: True Cooler Temp Corrected w/temp blank: 4.7, 4.7 3.6 °C

USDA Regulated Soil: (☑ N/A, water sample/Other: _____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☐No

Date/Initials of Person Examining Contents: KM 04/22/22

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☐No

If Yes to either question, fill out a Regulated Soil Checklist ENV-FRM-MIN4-0154 and include with SCUR/COC paperwork.

Location (check one): ☐ Duluth ☑ Minneapolis ☐ Virginia

| | | | | COMMENTS: |
|---|---|---|---|---|
| Chain of Custody Present and Filled Out? | ☑Yes | ☐No | | 1. |
| Chain of Custody Relinquished? | ☑Yes | ☐No | | 2. |
| Sampler Name and/or Signature on COC? | ☐Yes | ☐No | ☑N/A | 3. |
| Samples Arrived within Hold Time? | ☑Yes | ☐No | | 4. If Fecal: ☐<8 hrs ☐>8hr, <24 hrs, ☐>24 hrs |
| Short Hold Time Analysis (<72 hr)? | ☐Yes | ☑No | | 5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other |
| Rush Turn Around Time Requested? | ☐Yes | ☑No | | 6. |
| Sufficient Volume? | ☑Yes | ☐No | | 7. |
| Correct Containers Used? -Pace Containers Used? | ☑Yes ☑Yes | ☐No ☐No | | 8. |
| Containers Intact? | ☑Yes | ☐No | | 9. |
| Field Filtered Volume Received for Dissolved Tests? | ☐Yes | ☐No | ☑N/A | 10. Is sediment visible in the dissolved container? ☐Yes ☐No |
| Is sufficient information available to reconcile the samples to the COC? Matrix: ☑Water ☐Soil ☐Oil ☐Other- | ☑Yes | ☐No | | 11. If no, write ID/ Date/Time on Container Below: See Exception ☐ ENV-FRM-MIN4-0142 |
| All containers needing acid/base preservation have been checked? | ☐Yes | ☐No | ☑N/A | 12. Sample # |
| All containers needing preservation are found to be in compliance with EPA recommendation? ($HNO_3$, $H_2SO_4$, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide) | ☐Yes | ☐No | ☑N/A | ☐ NaOH ☐ $HNO_3$ ☐ $H_2SO_4$ ☐ Zinc Acetate |
| Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS | ☑Yes | ☐No | ☐N/A | Positive for Res. Chlorine? ☐Yes ☐No pH Paper Lot# See Exception ☐ ENV-FRM-MIN4-0142 |
| | | | | Res. Chlorine \| 0-6 Roll \| 0-6 Strip \| 0-14 Strip |
| Headspace in Methyl Mercury Container? | ☐Yes | ☐No | ☑N/A | |
| Extra labels present on soil VOA or WIDRO containers? | ☐Yes | ☐No | ☑N/A | 13. See Exception ☐ ENV-FRM-MIN4-0140 |
| Headspace in VOA Vials (greater than 6mm)? | ☐Yes | ☐No | ☑N/A | |
| Trip Blank Present? | ☐Yes | ☐No | ☑N/A | 14. Pace Trip Blank Lot # (if purchased): |
| Trip Blank Custody Seals Present? | ☐Yes | ☐No | ☑N/A | |

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: _____ Date/Time: _____ Field Data Required? ☐Yes ☐No

Comments/Resolution: _____

Project Manager Review: Sean C. Murphy Date: 04/22/22

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e., out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: _____

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| 40243698001 | MUNISING BIOSOLIDS | SW3535 | 33020 | PFAS-36 | B220519D_00 |

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Reporting Flags

A = Reporting Limit based on signal to noise (EDL)

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

**REPORT OF LABORATORY ANALYSIS**

# Appendix B

Sample Analysis Summary

**Pace Analytical Services, LLC**
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Fax: 612.607.6444
www.pacelabs.com



# Sample Analysis Summary

PFAS by Isotope Dilution

| | | | |
|---|---|---|---|
| Client Sample ID | MUNISING BIOSOLIDS | Extraction Date | 05/12/2022 09:29 |
| Lab Sample ID | 40243698001 | Total Amount Extracted | 5.08g |
| Lab File ID | B220519D_004 | Percent Moisture | 95.7391% |
| Matrix | Soil | Ical ID | 220517A02 |
| Collected | 04/19/2022 17:00 | CCal File | B220519D_001 |
| Received | 04/22/2022 12:50 | Ending CCal File | B220519D_007 |
| | | Blank File | A220516B_007 |

| Compound | Concentration (ug/Kg) | QL (ug/Kg) | RL (ug/Kg) | MDL (ug/Kg) | Dil. | CAS No. | Qual. | Analyzed |
|---|---|---|---|---|---|---|---|---|
| PFBA | ND | 2.3 | 2.3 | 0.55 | 1 | 375-22-4 | | 05/20/2022 04:11 |
| PFPeA | 3.5 | 2.3 | 2.3 | 0.61 | 1 | 2706-90-3 | | 05/20/2022 04:11 |
| HFPO-DA | ND | 2.3 | 2.3 | 0.69 | 1 | 13252-13-6 | | 05/20/2022 04:11 |
| PFBS | 2.7 | 2.0 | 2.0 | 0.51 | 1 | 375-73-5 | | 05/20/2022 04:11 |
| PFHxA | 3.9 | 2.3 | 2.3 | 0.69 | 1 | 307-24-4 | | 05/20/2022 04:11 |
| 4:2 FTS | ND | 2.2 | 2.2 | 0.73 | 1 | 757124-72-4 | | 05/20/2022 04:11 |
| PFPeS | ND | 2.2 | 2.2 | 0.43 | 1 | 2706-91-4 | | 05/20/2022 04:11 |
| PFHpA | ND | 2.3 | 2.3 | 0.52 | 1 | 375-85-9 | | 05/20/2022 04:11 |
| DONA | ND | 2.2 | 2.2 | 0.89 | 1 | 919005-14-4 | | 05/20/2022 04:11 |
| PFHxS | ND | 2.1 | 2.1 | 0.51 | 1 | 355-46-4 | | 05/20/2022 04:11 |
| PFOA | 5.2 | 2.3 | 2.3 | 0.52 | 1 | 335-67-1 | | 05/20/2022 04:11 |
| 6:2 FTS | ND | 2.2 | 2.2 | 0.74 | 1 | 27619-97-2 | | 05/20/2022 04:11 |
| PFHpS | ND | 2.2 | 2.2 | 0.58 | 1 | 375-92-8 | | 05/20/2022 04:11 |
| PFNA | ND | 2.3 | 2.3 | 0.66 | 1 | 375-95-1 | | 05/20/2022 04:11 |
| PFOSAm | ND | 2.3 | 2.3 | 0.54 | 1 | 754-91-6 | | 05/20/2022 04:11 |
| PFOS | 21 | 2.1 | 2.1 | 0.64 | 1 | 1763-23-1 | | 05/20/2022 04:11 |
| PFDA | 6.3 | 2.3 | 2.3 | 0.50 | 1 | 335-76-2 | | 05/20/2022 04:11 |
| 8:2 FTS | ND | 2.2 | 2.2 | 0.60 | 1 | 39108-34-4 | | 05/20/2022 04:11 |
| 9-Cl-PF3ON | ND | 2.2 | 2.2 | 0.34 | 1 | 756426-58-1 | | 05/20/2022 04:11 |
| PFNS | ND | 2.2 | 2.2 | 0.41 | 1 | 68259-12-1 | | 05/20/2022 04:11 |
| PFUnDA | ND | 2.3 | 2.3 | 0.65 | 1 | 2058-94-8 | | 05/20/2022 04:11 |
| NMeFOSAA | 6.6 | 2.3 | 2.3 | 0.54 | 1 | 2355-31-9 | | 05/20/2022 04:11 |
| NEtFOSAA | 3.4 | 2.3 | 2.3 | 0.57 | 1 | 2991-50-6 | | 05/20/2022 04:11 |
| PFDS | 3.3 | 2.2 | 2.2 | 0.58 | 1 | 335-77-3 | | 05/20/2022 04:11 |
| PFDOA | ND | 2.3 | 2.3 | 0.61 | 1 | 307-55-1 | | 05/20/2022 04:11 |
| 11-Cl-PF3OUdS | ND | 2.2 | 2.2 | 0.37 | 1 | 763051-92-9 | | 05/20/2022 04:11 |
| PFTrDA | ND | 2.3 | 2.3 | 0.49 | 1 | 72629-94-8 | | 05/20/2022 04:11 |
| PFTDA | ND | 2.3 | 2.3 | 0.74 | 1 | 376-06-7 | | 05/20/2022 04:11 |

**Injection Internal Standards**

| Compound | Known Conc. | Conc. Found | %Recovery | Recovery Limits | Qualifiers | Analyzed |
|---|---|---|---|---|---|---|
| 13C2_PFHxA | 23 | 21 | 93 | 50-150 | | 05/20/2022 04:11 |
| 13C4_PFOA | 23 | 20 | 88 | 50-150 | | 05/20/2022 04:11 |
| 13C2_PFDA | 23 | 22 | 96 | 50-150 | | 05/20/2022 04:11 |
| 13C4_PFOS | 22 | 22 | 99 | 50-150 | | 05/20/2022 04:11 |

## REPORT OF LABORATORY ANALYSIS

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Minneapolis, MN 55414
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www.pacelabs.com



# Sample Analysis Summary

PFAS by Isotope Dilution

| | | | |
|---|---|---|---|
| Client Sample ID | MUNISING BIOSOLIDS | Extraction Date | 05/12/2022 09:29 |
| Lab Sample ID | 40243698001 | Total Amount Extracted | 5.08g |
| Lab File ID | B220519D_004 | Percent Moisture | 95.7391% |
| Matrix | Soil | Ical ID | 220517A02 |
| Collected | 04/19/2022 17:00 | CCal File | B220519D_001 |
| Received | 04/22/2022 12:50 | Ending CCal File | B220519D_007 |
| | | Blank File | A220516B_007 |

**Extracted Internal Standards**

| Compound | Known Conc. | Conc. Found | %Recovery | Recovery Limits | Qualifiers | Analyzed |
|---|---|---|---|---|---|---|
| 13C4_PFBA | 23 | 7.3 | **32** | 50-150 | R | 05/20/2022 04:11 |
| 13C5_PFPeA | 23 | 13 | 57 | 50-150 | | 05/20/2022 04:11 |
| 13C3_PFBS | 21 | 15 | 69 | 50-150 | | 05/20/2022 04:11 |
| 13C2_4:2FTS | 22 | 58 | **267** | 50-150 | R | 05/20/2022 04:11 |
| 13C5_PFHxA | 23 | 15 | 66 | 50-150 | | 05/20/2022 04:11 |
| 13C4_PFHpA | 23 | 16 | 67 | 50-150 | | 05/20/2022 04:11 |
| 13C3_PFHxS | 22 | 16 | 73 | 50-150 | | 05/20/2022 04:11 |
| 13C2_6:2FTS | 22 | 49 | **223** | 50-150 | R | 05/20/2022 04:11 |
| 13C8_PFOA | 23 | 16 | 70 | 50-150 | | 05/20/2022 04:11 |
| 13C9_PFNA | 23 | 17 | 72 | 50-150 | | 05/20/2022 04:11 |
| 13C8_PFOS | 22 | 16 | 73 | 50-150 | | 05/20/2022 04:11 |
| 13C2_8:2FTS | 22 | 60 | **269** | 50-150 | R | 05/20/2022 04:11 |
| 13C6_PFDA | 23 | 17 | 72 | 50-150 | | 05/20/2022 04:11 |
| d3-MeFOSAA | 23 | 25 | 107 | 50-150 | | 05/20/2022 04:11 |
| 13C8_PFOSA | 23 | 18 | 78 | 50-150 | | 05/20/2022 04:11 |
| d5-EtFOSAA | 23 | 28 | 121 | 50-150 | | 05/20/2022 04:11 |
| 13C7_PFUdA | 23 | 15 | 67 | 50-150 | | 05/20/2022 04:11 |
| 13C2_PFDoA | 23 | 20 | 86 | 50-150 | | 05/20/2022 04:11 |
| 13C2_PFTeDA | 23 | 19 | 80 | 50-150 | | 05/20/2022 04:11 |
| 13C3_HFPO-DA | 23 | 14 | 60 | 50-150 | | 05/20/2022 04:11 |

**Injection Internal Standards**

| Compound | Ion Abund. Ratio | Reference Ratio | Retention Time | Reference Time | Signal to Noise | Qualifiers | Analyzed |
|---|---|---|---|---|---|---|---|
| 13C2_PFHxA | N/A | N/A | 5.79 | 5.82 | 12 | | 05/20/2022 04:11 |
| 13C4_PFOA | N/A | N/A | 7.16 | 7.15 | 18 | | 05/20/2022 04:11 |
| 13C2_PFDA | N/A | N/A | 8.55 | 8.57 | 26 | | 05/20/2022 04:11 |
| 13C4_PFOS | N/A | N/A | 9.06 | 9.07 | 42 | | 05/20/2022 04:11 |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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## Sample Analysis Summary

PFAS by Isotope Dilution

| | | | |
|---|---|---|---|
| Client Sample ID | MUNISING BIOSOLIDS | Extraction Date | 05/12/2022 09:29 |
| Lab Sample ID | 40243698001 | Total Amount Extracted | 5.08g |
| Lab File ID | B220519D_004 | Percent Moisture | 95.7391% |
| Matrix | Soil | Ical ID | 220517A02 |
| Collected | 04/19/2022 17:00 | CCal File | B220519D_001 |
| Received | 04/22/2022 12:50 | Ending CCal File | B220519D_007 |
| | | Blank File | A220516B_007 |

**Extracted Internal Standards**

| Compound | Ion Abund. Ratio | Reference Ratio | Retention Time | Reference Time | Signal to Noise | Qualifiers | Analyzed |
|---|---|---|---|---|---|---|---|
| 13C4_PFBA | N/A | N/A | 4.36 | 4.40 | 14 | R | 05/20/2022 04:11 |
| 13C5_PFPeA | N/A | N/A | 5.12 | 5.16 | 14 | | 05/20/2022 04:11 |
| 13C3_PFBS | N/A | N/A | 6.07 | 6.08 | 38 | | 05/20/2022 04:11 |
| 13C2_4:2FTS | N/A | N/A | 5.50 | 5.55 | 40 | R | 05/20/2022 04:11 |
| 13C5_PFHxA | N/A | N/A | 5.79 | 5.82 | 12 | | 05/20/2022 04:11 |
| 13C4_PFHpA | N/A | N/A | 6.48 | 6.50 | 16 | | 05/20/2022 04:11 |
| 13C3_PFHxS | N/A | N/A | 7.61 | 7.64 | 43 | | 05/20/2022 04:11 |
| 13C2_6:2FTS | N/A | N/A | 6.81 | 6.79 | 35 | R | 05/20/2022 04:11 |
| 13C8_PFOA | N/A | N/A | 7.16 | 7.16 | 17 | | 05/20/2022 04:11 |
| 13C9_PFNA | N/A | N/A | 7.85 | 7.83 | 19 | | 05/20/2022 04:11 |
| 13C8_PFOS | N/A | N/A | 9.06 | 9.06 | 53 | | 05/20/2022 04:11 |
| 13C2_8:2FTS | N/A | N/A | 8.15 | 8.14 | 48 | R | 05/20/2022 04:11 |
| 13C6_PFDA | N/A | N/A | 8.55 | 8.55 | 55 | | 05/20/2022 04:11 |
| d3-MeFOSAA | N/A | N/A | 8.40 | 8.38 | 10 | | 05/20/2022 04:11 |
| 13C8_PFOSA | N/A | N/A | 10.77 | 10.63 | 17 | | 05/20/2022 04:11 |
| d5-EtFOSAA | N/A | N/A | 8.71 | 8.69 | 16 | | 05/20/2022 04:11 |
| 13C7_PFUdA | N/A | N/A | 9.26 | 9.27 | 16 | | 05/20/2022 04:11 |
| 13C2_PFDoA | N/A | N/A | 9.96 | 9.98 | 75 | | 05/20/2022 04:11 |
| 13C2_PFTeDA | N/A | N/A | 11.32 | 11.36 | 14 | | 05/20/2022 04:11 |
| 13C3_HFPO-DA | N/A | N/A | 6.08 | 6.11 | 10 | | 05/20/2022 04:11 |

## REPORT OF LABORATORY ANALYSIS

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# Sample Analysis Summary

PFAS by Isotope Dilution

| | | | |
|---|---|---|---|
| Client Sample ID | MUNISING BIOSOLIDS | Extraction Date | 05/12/2022 09:29 |
| Lab Sample ID | 40243698001 | Total Amount Extracted | 5.08g |
| Lab File ID | B220519D_004 | Percent Moisture | 95.7391% |
| Matrix | Soil | Ical ID | 220517A02 |
| Collected | 04/19/2022 17:00 | CCal File | B220519D_001 |
| Received | 04/22/2022 12:50 | Ending CCal File | B220519D_007 |
| | | Blank File | A220516B_007 |

**Native Analytes**

| Compound | Ion Abund. Ratio | Reference Ratio | Retention Time | Reference Time | Signal to Noise | Qualifiers | Analyzed |
|---|---|---|---|---|---|---|---|
| PFBA | N/A | N/A | 4.44 | 4.42 | ND | | 05/20/2022 04:11 |
| PFPeA | N/A | N/A | 5.12 | 5.18 | 15 | | 05/20/2022 04:11 |
| HFPO-DA | 17.0 | 0.25 | 6.10 | 6.11 | ND | | 05/20/2022 04:11 |
| PFBS | 0.39 | 0.41 | 6.07 | 6.11 | 15 | | 05/20/2022 04:11 |
| PFHxA | 0.07 | 0.08 | 5.80 | 5.84 | 12 | | 05/20/2022 04:11 |
| 4:2 FTS | 0.00 | 0.80 | 0.00 | 5.56 | ND | | 05/20/2022 04:11 |
| PFPeS | 0.48 | 0.37 | 6.87 | 6.89 | ND | | 05/20/2022 04:11 |
| PFHpA | 0.25 | 0.30 | 6.49 | 6.49 | ND | | 05/20/2022 04:11 |
| DONA | 1.30 | 0.62 | 6.74 | 6.76 | ND | | 05/20/2022 04:11 |
| PFHxS | 0.28 | 0.35 | 7.61 | 7.42 | ND | | 05/20/2022 04:11 |
| PFOA | 0.38 | 0.37 | 7.17 | 7.08 | 26 | | 05/20/2022 04:11 |
| 6:2 FTS | 0.75 | 0.84 | 6.81 | 6.83 | ND | | 05/20/2022 04:11 |
| PFHpS | 0.28 | 0.41 | 8.36 | 8.37 | ND | | 05/20/2022 04:11 |
| PFNA | 0.12 | 0.13 | 7.86 | 7.87 | ND | | 05/20/2022 04:11 |
| PFOSAm | N/A | N/A | 10.78 | 10.76 | ND | | 05/20/2022 04:11 |
| PFOS | 0.35 | 0.37 | 9.07 | 9.11 | 43 | | 05/20/2022 04:11 |
| PFDA | 0.18 | 0.20 | 8.56 | 8.60 | 48 | | 05/20/2022 04:11 |
| 8:2 FTS | 1.10 | 0.89 | 8.16 | 8.19 | ND | | 05/20/2022 04:11 |
| 9-Cl-PF3ON | 0.19 | 0.05 | 9.59 | 9.64 | ND | | 05/20/2022 04:11 |
| PFNS | 0.10 | 0.53 | 9.77 | 9.83 | ND | | 05/20/2022 04:11 |
| PFUnDA | 0.12 | 0.14 | 9.26 | 9.31 | ND | | 05/20/2022 04:11 |
| NMeFOSAA | 0.74 | 0.83 | 8.41 | 8.42 | 69 | | 05/20/2022 04:11 |
| NEtFOSAA | 0.64 | 0.60 | 8.72 | 8.74 | 31 | | 05/20/2022 04:11 |
| PFDS | 0.45 | 0.36 | 10.47 | 10.53 | 12 | | 05/20/2022 04:11 |
| PFDOA | 0.18 | 0.18 | 9.96 | 10.02 | ND | | 05/20/2022 04:11 |
| 11-Cl-PF3OUdS | 0.00 | 0.02 | 0.00 | 11.06 | ND | | 05/20/2022 04:11 |
| PFTrDA | 0.18 | 0.17 | 10.65 | 10.75 | ND | | 05/20/2022 04:11 |
| PFTDA | 0.28 | 0.25 | 11.32 | 11.43 | ND | | 05/20/2022 04:11 |

## REPORT OF LABORATORY ANALYSIS

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# Method Blank Analysis Summary

PFAS by Isotope Dilution

| | | | |
|---|---|---|---|
| Client Sample ID | BLKSM | Extraction Date | 05/12/2022 09:29 |
| Lab Sample ID | BLANK-98541 | Total Amount Extracted | 5.06g |
| Lab File ID | A220516B_007 | Percent Moisture | 100% |
| Matrix | Soil | Ical ID | 220510A03 |
| Collected | 05/03/2022 10:36 | CCal File | A220516B_005 |
| Received | 05/03/2022 10:36 | Ending CCal File | A220516B_017 |
| | | Blank File | |

| Compound | Concentration (ug/Kg) | QL (ug/Kg) | RL (ug/Kg) | MDL (ug/Kg) | Dil. | CAS No. | Qual. | Analyzed |
|---|---|---|---|---|---|---|---|---|
| PFBA | ND | 0.09 | 0.09 | 0.02 | 1 | 375-22-4 | | 05/16/2022 14:33 |
| PFPeA | ND | 0.09 | 0.09 | 0.02 | 1 | 2706-90-3 | | 05/16/2022 14:33 |
| HFPO-DA | ND | 0.09 | 0.09 | 0.02 | 1 | 13252-13-6 | | 05/16/2022 14:33 |
| PFBS | ND | 0.08 | 0.08 | 0.02 | 1 | 375-73-5 | | 05/16/2022 14:33 |
| PFHxA | ND | 0.09 | 0.09 | 0.03 | 1 | 307-24-4 | | 05/16/2022 14:33 |
| 4:2 FTS | ND | 0.09 | 0.09 | 0.03 | 1 | 757124-72-4 | | 05/16/2022 14:33 |
| PFPeS | ND | 0.09 | 0.09 | 0.01 | 1 | 2706-91-4 | | 05/16/2022 14:33 |
| PFHpA | ND | 0.09 | 0.09 | 0.02 | 1 | 375-85-9 | | 05/16/2022 14:33 |
| DONA | ND | 0.09 | 0.09 | 0.03 | 1 | 919005-14-4 | | 05/16/2022 14:33 |
| PFHxS | ND | 0.09 | 0.09 | 0.02 | 1 | 355-46-4 | | 05/16/2022 14:33 |
| PFOA | ND | 0.09 | 0.09 | 0.02 | 1 | 335-67-1 | | 05/16/2022 14:33 |
| 6:2 FTS | ND | 0.09 | 0.09 | 0.03 | 1 | 27619-97-2 | | 05/16/2022 14:33 |
| PFHpS | ND | 0.09 | 0.09 | 0.02 | 1 | 375-92-8 | | 05/16/2022 14:33 |
| PFNA | ND | 0.09 | 0.09 | 0.02 | 1 | 375-95-1 | | 05/16/2022 14:33 |
| PFOSAm | ND | 0.09 | 0.09 | 0.02 | 1 | 754-91-6 | | 05/16/2022 14:33 |
| PFOS | ND | 0.09 | 0.09 | 0.02 | 1 | 1763-23-1 | | 05/16/2022 14:33 |
| PFDA | ND | 0.09 | 0.09 | 0.02 | 1 | 335-76-2 | | 05/16/2022 14:33 |
| 8:2 FTS | ND | 0.09 | 0.09 | 0.02 | 1 | 39108-34-4 | | 05/16/2022 14:33 |
| 9-Cl-PF3ON | ND | 0.09 | 0.09 | 0.01 | 1 | 756426-58-1 | | 05/16/2022 14:33 |
| PFNS | ND | 0.09 | 0.09 | 0.01 | 1 | 68259-12-1 | | 05/16/2022 14:33 |
| PFUnDA | ND | 0.09 | 0.09 | 0.02 | 1 | 2058-94-8 | | 05/16/2022 14:33 |
| NMeFOSAA | ND | 0.09 | 0.09 | 0.02 | 1 | 2355-31-9 | | 05/16/2022 14:33 |
| NEtFOSAA | ND | 0.09 | 0.09 | 0.02 | 1 | 2991-50-6 | | 05/16/2022 14:33 |
| PFDS | ND | 0.09 | 0.09 | 0.02 | 1 | 335-77-3 | | 05/16/2022 14:33 |
| PFDOA | ND | 0.09 | 0.09 | 0.02 | 1 | 307-55-1 | | 05/16/2022 14:33 |
| 11-Cl-PF3OUdS | ND | 0.09 | 0.09 | 0.01 | 1 | 763051-92-9 | | 05/16/2022 14:33 |
| PFTrDA | ND | 0.09 | 0.09 | 0.02 | 1 | 72629-94-8 | | 05/16/2022 14:33 |
| PFTDA | ND | 0.09 | 0.09 | 0.03 | 1 | 376-06-7 | | 05/16/2022 14:33 |

**Injection Internal Standards**

| Compound | Known Conc. | Conc. Found | %Recovery | Recovery Limits | Qualifiers | Analyzed |
|---|---|---|---|---|---|---|
| 13C2_PFHxA | 0.99 | 0.92 | 93 | 50-150 | | 05/16/2022 14:33 |
| 13C4_PFOA | 0.99 | 0.92 | 93 | 50-150 | | 05/16/2022 14:33 |
| 13C2_PFDA | 0.99 | 0.95 | 96 | 50-150 | | 05/16/2022 14:33 |
| 13C4_PFOS | 0.95 | 0.93 | 98 | 50-150 | | 05/16/2022 14:33 |

## REPORT OF LABORATORY ANALYSIS

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# Method Blank Analysis Summary

PFAS by Isotope Dilution



| | | | |
|---|---|---|---|
| Client Sample ID | BLKSM | Extraction Date | 05/12/2022 09:29 |
| Lab Sample ID | BLANK-98541 | Total Amount Extracted | 5.06g |
| Lab File ID | A220516B_007 | Percent Moisture | 100% |
| Matrix | Soil | Ical ID | 220510A03 |
| Collected | 05/03/2022 10:36 | CCal File | A220516B_005 |
| Received | 05/03/2022 10:36 | Ending CCal File | A220516B_017 |
| | | Blank File | |

**Extracted Internal Standards**

| Compound | Known Conc. | Conc. Found | %Recovery | Recovery Limits | Qualifiers | Analyzed |
|---|---|---|---|---|---|---|
| 13C4_PFBA | 0.99 | 0.83 | 84 | 50-150 | | 05/16/2022 14:33 |
| 13C5_PFPeA | 0.99 | 0.83 | 84 | 50-150 | | 05/16/2022 14:33 |
| 13C3_PFBS | 0.92 | 0.80 | 87 | 50-150 | | 05/16/2022 14:33 |
| 13C2_4:2FTS | 0.92 | 0.79 | 85 | 50-150 | | 05/16/2022 14:33 |
| 13C5_PFHxA | 0.99 | 0.83 | 84 | 50-150 | | 05/16/2022 14:33 |
| 13C4_PFHpA | 0.99 | 0.85 | 86 | 50-150 | | 05/16/2022 14:33 |
| 13C3_PFHxS | 0.94 | 0.81 | 86 | 50-150 | | 05/16/2022 14:33 |
| 13C2_6:2FTS | 0.94 | 0.88 | 94 | 50-150 | | 05/16/2022 14:33 |
| 13C8_PFOA | 0.99 | 0.86 | 87 | 50-150 | | 05/16/2022 14:33 |
| 13C9_PFNA | 0.99 | 0.83 | 84 | 50-150 | | 05/16/2022 14:33 |
| 13C8_PFOS | 0.95 | 0.79 | 84 | 50-150 | | 05/16/2022 14:33 |
| 13C2_8:2FTS | 0.95 | 0.86 | 91 | 50-150 | | 05/16/2022 14:33 |
| 13C6_PFDA | 0.99 | 0.89 | 90 | 50-150 | | 05/16/2022 14:33 |
| d3-MeFOSAA | 0.99 | 0.87 | 88 | 50-150 | | 05/16/2022 14:33 |
| 13C8_PFOSA | 0.99 | 0.86 | 87 | 50-150 | | 05/16/2022 14:33 |
| d5-EtFOSAA | 0.99 | 0.86 | 87 | 50-150 | | 05/16/2022 14:33 |
| 13C7_PFUdA | 0.99 | 0.87 | 88 | 50-150 | | 05/16/2022 14:33 |
| 13C2_PFDoA | 0.99 | 0.93 | 94 | 50-150 | | 05/16/2022 14:33 |
| 13C2_PFTeDA | 0.99 | 0.86 | 87 | 50-150 | | 05/16/2022 14:33 |
| 13C3_HFPO-DA | 0.99 | 0.86 | 87 | 50-150 | | 05/16/2022 14:33 |

**Injection Internal Standards**

| Compound | Ion Abund. Ratio | Reference Ratio | Retention Time | Reference Time | Signal to Noise | Qualifiers | Analyzed |
|---|---|---|---|---|---|---|---|
| 13C2_PFHxA | N/A | N/A | 4.95 | 4.94 | 32 | | 05/16/2022 14:33 |
| 13C4_PFOA | N/A | N/A | 5.92 | 5.92 | 42 | | 05/16/2022 14:33 |
| 13C2_PFDA | N/A | N/A | 6.79 | 6.79 | 84 | | 05/16/2022 14:33 |
| 13C4_PFOS | N/A | N/A | 7.08 | 7.06 | 20 | | 05/16/2022 14:33 |

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# Method Blank Analysis Summary

PFAS by Isotope Dilution

| | | | |
|---|---|---|---|
| Client Sample ID | BLKSM | Extraction Date | 05/12/2022 09:29 |
| Lab Sample ID | BLANK-98541 | Total Amount Extracted | 5.06g |
| Lab File ID | A220516B_007 | Percent Moisture | 100% |
| Matrix | Soil | Ical ID | 220510A03 |
| Collected | 05/03/2022 10:36 | CCal File | A220516B_005 |
| Received | 05/03/2022 10:36 | Ending CCal File | A220516B_017 |
| | | Blank File | |

**Extracted Internal Standards**

| Compound | Ion Abund. Ratio | Reference Ratio | Retention Time | Reference Time | Signal to Noise | Qualifiers | Analyzed |
|---|---|---|---|---|---|---|---|
| 13C4_PFBA | N/A | N/A | 3.49 | 3.48 | 61 | | 05/16/2022 14:33 |
| 13C5_PFPeA | N/A | N/A | 4.35 | 4.33 | 33 | | 05/16/2022 14:33 |
| 13C3_PFBS | N/A | N/A | 5.11 | 5.10 | 29 | | 05/16/2022 14:33 |
| 13C2_4:2FTS | N/A | N/A | 4.74 | 4.71 | 78 | | 05/16/2022 14:33 |
| 13C5_PFHxA | N/A | N/A | 4.95 | 4.93 | 36 | | 05/16/2022 14:33 |
| 13C4_PFHpA | N/A | N/A | 5.46 | 5.43 | 25 | | 05/16/2022 14:33 |
| 13C3_PFHxS | N/A | N/A | 6.18 | 6.15 | 29 | | 05/16/2022 14:33 |
| 13C2_6:2FTS | N/A | N/A | 5.69 | 5.66 | 13 | | 05/16/2022 14:33 |
| 13C8_PFOA | N/A | N/A | 5.92 | 5.89 | 83 | | 05/16/2022 14:33 |
| 13C9_PFNA | N/A | N/A | 6.36 | 6.33 | 46 | | 05/16/2022 14:33 |
| 13C8_PFOS | N/A | N/A | 7.08 | 7.06 | 35 | | 05/16/2022 14:33 |
| 13C2_8:2FTS | N/A | N/A | 6.56 | 6.52 | 59 | | 05/16/2022 14:33 |
| 13C6_PFDA | N/A | N/A | 6.80 | 6.76 | 77 | | 05/16/2022 14:33 |
| d3-MeFOSAA | N/A | N/A | 6.75 | 6.72 | 31 | | 05/16/2022 14:33 |
| 13C8_PFOSA | N/A | N/A | 8.63 | 8.62 | 28 | | 05/16/2022 14:33 |
| d5-EtFOSAA | N/A | N/A | 6.95 | 6.92 | 99 | | 05/16/2022 14:33 |
| 13C7_PFUdA | N/A | N/A | 7.22 | 7.19 | 47 | | 05/16/2022 14:33 |
| 13C2_PFDoA | N/A | N/A | 7.64 | 7.62 | 32 | | 05/16/2022 14:33 |
| 13C2_PFTeDA | N/A | N/A | 8.48 | 8.47 | 31 | | 05/16/2022 14:33 |
| 13C3_HFPO-DA | N/A | N/A | 5.16 | 5.14 | 25 | | 05/16/2022 14:33 |

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# Method Blank Analysis Summary

PFAS by Isotope Dilution

| | | | |
|---|---|---|---|
| Client Sample ID | BLKSM | Extraction Date | 05/12/2022 09:29 |
| Lab Sample ID | BLANK-98541 | Total Amount Extracted | 5.06g |
| Lab File ID | A220516B_007 | Percent Moisture | 100% |
| Matrix | Soil | Ical ID | 220510A03 |
| Collected | 05/03/2022 10:36 | CCal File | A220516B_005 |
| Received | 05/03/2022 10:36 | Ending CCal File | A220516B_017 |
| | | Blank File | |

**Native Analytes**

| Compound | Ion Abund. Ratio | Reference Ratio | Retention Time | Reference Time | Signal to Noise | Qualifiers | Analyzed |
|---|---|---|---|---|---|---|---|
| PFBA | N/A | N/A | 0.00 | 3.50 | ND | | 05/16/2022 14:33 |
| PFPeA | N/A | N/A | 0.00 | 4.36 | ND | | 05/16/2022 14:33 |
| HFPO-DA | 0.00 | 0.46 | 0.00 | 5.17 | ND | | 05/16/2022 14:33 |
| PFBS | 0.00 | 0.32 | 0.00 | 5.12 | ND | | 05/16/2022 14:33 |
| PFHxA | 0.00 | 0.05 | 0.00 | 4.95 | ND | | 05/16/2022 14:33 |
| 4:2 FTS | 0.00 | 0.56 | 0.00 | 4.73 | ND | | 05/16/2022 14:33 |
| PFPeS | 0.00 | 0.30 | 0.00 | 5.69 | ND | | 05/16/2022 14:33 |
| PFHpA | 0.00 | 0.29 | 0.00 | 5.45 | ND | | 05/16/2022 14:33 |
| DONA | 0.00 | 0.47 | 0.00 | 5.62 | ND | | 05/16/2022 14:33 |
| PFHxS | 0.00 | 0.26 | 0.00 | 6.19 | ND | | 05/16/2022 14:33 |
| PFOA | 0.00 | 0.36 | 0.00 | 5.92 | ND | | 05/16/2022 14:33 |
| 6:2 FTS | 0.00 | 0.51 | 0.00 | 5.69 | ND | | 05/16/2022 14:33 |
| PFHpS | 0.00 | 0.24 | 0.00 | 6.64 | ND | | 05/16/2022 14:33 |
| PFNA | 0.00 | 0.20 | 0.00 | 6.36 | ND | | 05/16/2022 14:33 |
| PFOSAm | N/A | N/A | 8.63 | 8.64 | ND | | 05/16/2022 14:33 |
| PFOS | 0.00 | 0.20 | 0.00 | 7.09 | ND | | 05/16/2022 14:33 |
| PFDA | 0.00 | 0.07 | 0.00 | 6.79 | ND | | 05/16/2022 14:33 |
| 8:2 FTS | 0.00 | 0.64 | 0.00 | 6.55 | ND | | 05/16/2022 14:33 |
| 9-Cl-PF3ON | 0.00 | 0.02 | 0.00 | 7.40 | ND | | 05/16/2022 14:33 |
| PFNS | 0.00 | 0.24 | 0.00 | 7.52 | ND | | 05/16/2022 14:33 |
| PFUnDA | 0.00 | 0.08 | 0.00 | 7.22 | ND | | 05/16/2022 14:33 |
| NMeFOSAA | 0.00 | 0.56 | 0.00 | 6.75 | ND | | 05/16/2022 14:33 |
| NEtFOSAA | 0.00 | 0.67 | 0.00 | 6.96 | ND | | 05/16/2022 14:33 |
| PFDS | 0.00 | 0.24 | 0.00 | 7.93 | ND | | 05/16/2022 14:33 |
| PFDOA | 0.00 | 0.12 | 0.00 | 7.65 | ND | | 05/16/2022 14:33 |
| 11-Cl-PF3OUdS | 0.00 | 0.01 | 0.00 | 8.24 | ND | | 05/16/2022 14:33 |
| PFTrDA | 0.00 | 0.15 | 0.00 | 8.07 | ND | | 05/16/2022 14:33 |
| PFTDA | 0.00 | 0.14 | 0.00 | 8.51 | ND | | 05/16/2022 14:33 |

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# LCS Analysis Summary

PFAS by Isotope Dilution

| | | | |
|---|---|---|---|
| Lab Sample ID | LCS-98542 | Instrument ID | 10LCMS02 |
| Run File Name | B220517B_005 | Column ID | 125GA90033 |
| Analyzed | 05/17/2022 20:20 | Ical ID | 220517A02 |
| Injected By | QL | Level | L |

**Injection Internal Standards**

| Compound | Known Conc. | Conc. Found | %Recovery | Recovery Limits | Qualifiers |
|---|---|---|---|---|---|
| 13C2_PFHxA | 0.99 | 1.1 | 107 | 50-150 | |
| 13C4_PFOA | 0.99 | 0.99 | 100 | 50-150 | |
| 13C2_PFDA | 0.99 | 1.0 | 106 | 50-150 | |
| 13C4_PFOS | 0.95 | 1.1 | 114 | 50-150 | |

**Extracted Internal Standards**

| Compound | Known Conc. | Conc. Found | %Recovery | Recovery Limits | Qualifiers |
|---|---|---|---|---|---|
| 13C4_PFBA | 0.99 | 0.97 | 97 | 50-150 | |
| 13C5_PFPeA | 0.99 | 0.98 | 98 | 50-150 | |
| 13C3_PFBS | 0.92 | 0.85 | 92 | 50-150 | |
| 13C2_4:2FTS | 0.93 | 0.84 | 91 | 50-150 | |
| 13C5_PFHxA | 0.99 | 0.97 | 98 | 50-150 | |
| 13C4_PFHpA | 0.99 | 0.97 | 98 | 50-150 | |
| 13C3_PFHxS | 0.94 | 0.85 | 90 | 50-150 | |
| 13C2_6:2FTS | 0.94 | 1.00 | 106 | 50-150 | |
| 13C8_PFOA | 0.99 | 0.96 | 97 | 50-150 | |
| 13C9_PFNA | 0.99 | 1.0 | 102 | 50-150 | |
| 13C8_PFOS | 0.95 | 0.97 | 103 | 50-150 | |
| 13C2_8:2FTS | 0.95 | 1.1 | 116 | 50-150 | |
| 13C6_PFDA | 0.99 | 0.93 | 93 | 50-150 | |
| d3-MeFOSAA | 0.99 | 1.0 | 101 | 50-150 | |
| 13C8_PFOSA | 0.99 | 0.95 | 95 | 50-150 | |
| d5-EtFOSAA | 0.99 | 0.88 | 88 | 50-150 | |
| 13C7_PFUdA | 0.99 | 1.0 | 106 | 50-150 | |
| 13C2_PFDoA | 0.99 | 0.99 | 100 | 50-150 | |
| 13C2_PFTeDA | 0.99 | 0.95 | 96 | 50-150 | |
| 13C3_HFPO-DA | 0.99 | 0.94 | 95 | 50-150 | |

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## LCS Analysis Summary

PFAS by Isotope Dilution

| | | | |
|---|---|---|---|
| Lab Sample ID | LCS-98542 | Instrument ID | 10LCMS02 |
| Run File Name | B220517B_005 | Column ID | 125GA90033 |
| Analyzed | 05/17/2022 20:20 | Ical ID | 220517A02 |
| Injected By | QL | Level | L |

**Native Analytes**

| Compound | Known Conc. | Conc. Found | %Recovery | Recovery Limits | Qualifiers | CAS No. |
|---|---|---|---|---|---|---|
| PFBA | 0.20 | 0.21 | 105 | 71-135 | | 375-22-4 |
| PFPeA | 0.20 | 0.20 | 102 | 69-132 | | 2706-90-3 |
| HFPO-DA | 0.20 | 0.21 | 103 | 70-140 | | 13252-13-6 |
| PFBS | 0.18 | 0.18 | 101 | 72-128 | | 375-73-5 |
| PFHxA | 0.20 | 0.20 | 100 | 70-132 | | 307-24-4 |
| 4:2 FTS | 0.19 | 0.18 | 99 | 62-145 | | 757124-72-4 |
| PFPeS | 0.19 | 0.20 | 106 | 73-123 | | 2706-91-4 |
| PFHpA | 0.20 | 0.20 | 101 | 71-131 | | 375-85-9 |
| DONA | 0.19 | 0.20 | 109 | 70-140 | | 919005-14-4 |
| PFHxS | 0.18 | 0.18 | 100 | 67-130 | | 355-46-4 |
| PFOA | 0.20 | 0.21 | 106 | 69-133 | | 335-67-1 |
| 6:2 FTS | 0.19 | 0.19 | 102 | 64-140 | | 27619-97-2 |
| PFHpS | 0.19 | 0.18 | 93 | 70-132 | | 375-92-8 |
| PFNA | 0.20 | 0.20 | 102 | 72-129 | | 375-95-1 |
| PFOSAm | 0.20 | 0.20 | 100 | 67-137 | | 754-91-6 |
| PFOS | 0.18 | 0.18 | 96 | 68-136 | | 1763-23-1 |
| PFDA | 0.20 | 0.21 | 106 | 69-133 | | 335-76-2 |
| 8:2 FTS | 0.19 | 0.19 | 97 | 65-137 | | 39108-34-4 |
| 9-Cl-PF3ON | 0.18 | 0.18 | 97 | 70-140 | | 756426-58-1 |
| PFNS | 0.19 | 0.19 | 100 | 69-125 | | 68259-12-1 |
| PFUnDA | 0.20 | 0.21 | 104 | 64-136 | | 2058-94-8 |
| NMeFOSAA | 0.20 | 0.22 | 110 | 63-144 | | 2355-31-9 |
| NEtFOSAA | 0.20 | 0.22 | 113 | 61-139 | | 2991-50-6 |
| PFDS | 0.19 | 0.17 | 91 | 59-134 | | 335-77-3 |
| PFDOA | 0.20 | 0.21 | 105 | 69-135 | | 307-55-1 |
| 11-Cl-PF3OUdS | 0.19 | 0.18 | 97 | 70-140 | | 763051-92-9 |
| PFTrDA | 0.20 | 0.20 | 99 | 66-139 | | 72629-94-8 |
| PFTDA | 0.20 | 0.21 | 105 | 69-133 | | 376-06-7 |

**Injection Internal Standards**

| Compound | Ion Abund. Ratio | Reference Ratio | Retention Time | Reference Time | Qualifiers |
|---|---|---|---|---|---|
| 13C2_PFHxA | N/A | N/A | 5.80 | 5.82 | |
| 13C4_PFOA | N/A | N/A | 7.18 | 7.15 | |
| 13C2_PFDA | N/A | N/A | 8.59 | 8.57 | |
| 13C4_PFOS | N/A | N/A | 9.11 | 9.07 | |

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## LCS Analysis Summary

PFAS by Isotope Dilution

| | | | |
|---|---|---|---|
| Lab Sample ID | LCS-98542 | Instrument ID | 10LCMS02 |
| Run File Name | B220517B_005 | Column ID | 125GA90033 |
| Analyzed | 05/17/2022 20:20 | Ical ID | 220517A02 |
| Injected By | QL | Level | L |

**Extracted Internal Standards**

| Compound | Ion Abund. Ratio | Reference Ratio | Retention Time | Reference Time | Qualifiers |
|---|---|---|---|---|---|
| 13C4_PFBA | N/A | N/A | 4.39 | 4.40 | |
| 13C5_PFPeA | N/A | N/A | 5.15 | 5.16 | |
| 13C3_PFBS | N/A | N/A | 6.08 | 6.08 | |
| 13C2_4:2FTS | N/A | N/A | 5.52 | 5.55 | |
| 13C5_PFHxA | N/A | N/A | 5.80 | 5.82 | |
| 13C4_PFHpA | N/A | N/A | 6.49 | 6.50 | |
| 13C3_PFHxS | N/A | N/A | 7.64 | 7.64 | |
| 13C2_6:2FTS | N/A | N/A | 6.82 | 6.79 | |
| 13C8_PFOA | N/A | N/A | 7.18 | 7.16 | |
| 13C9_PFNA | N/A | N/A | 7.88 | 7.83 | |
| 13C8_PFOS | N/A | N/A | 9.11 | 9.06 | |
| 13C2_8:2FTS | N/A | N/A | 8.18 | 8.14 | |
| 13C6_PFDA | N/A | N/A | 8.59 | 8.55 | |
| d3-MeFOSAA | N/A | N/A | 8.43 | 8.38 | |
| 13C8_PFOSA | N/A | N/A | 10.75 | 10.63 | |
| d5-EtFOSAA | N/A | N/A | 8.74 | 8.69 | |
| 13C7_PFUdA | N/A | N/A | 9.30 | 9.27 | |
| 13C2_PFDoA | N/A | N/A | 10.01 | 9.98 | |
| 13C2_PFTeDA | N/A | N/A | 11.38 | 11.36 | |
| 13C3_HFPO-DA | N/A | N/A | 6.09 | 6.11 | |

## REPORT OF LABORATORY ANALYSIS

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## LCS Analysis Summary

PFAS by Isotope Dilution

| | | | |
|---|---|---|---|
| Lab Sample ID | LCS-98542 | Instrument ID | 10LCMS02 |
| Run File Name | B220517B_005 | Column ID | 125GA90033 |
| Analyzed | 05/17/2022 20:20 | Ical ID | 220517A02 |
| Injected By | QL | Level | L |

**Native Analytes**

| Compound | Ion Abund. Ratio | Reference Ratio | Retention Time | Reference Time | Qualifiers |
|---|---|---|---|---|---|
| PFBA | N/A | N/A | 4.40 | 4.42 | |
| PFPeA | N/A | N/A | 5.15 | 5.18 | |
| HFPO-DA | 0.27 | 0.29 | 6.10 | 6.11 | |
| PFBS | 0.38 | 0.41 | 6.09 | 6.11 | |
| PFHxA | 0.08 | 0.08 | 5.81 | 5.84 | |
| 4:2 FTS | 0.90 | 0.84 | 5.52 | 5.56 | |
| PFPeS | 0.40 | 0.39 | 6.89 | 6.89 | |
| PFHpA | 0.28 | 0.31 | 6.50 | 6.49 | |
| DONA | 0.57 | 0.56 | 6.75 | 6.76 | |
| PFHxS | 0.36 | 0.30 | 7.64 | 7.42 | |
| PFOA | 0.38 | 0.38 | 7.19 | 7.08 | |
| 6:2 FTS | 0.82 | 0.77 | 6.82 | 6.83 | |
| PFHpS | 0.40 | 0.38 | 8.39 | 8.37 | |
| PFNA | 0.13 | 0.13 | 7.89 | 7.87 | |
| PFOSAm | N/A | N/A | 10.76 | 10.76 | |
| PFOS | 0.38 | 0.39 | 9.12 | 9.11 | |
| PFDA | 0.18 | 0.17 | 8.60 | 8.60 | |
| 8:2 FTS | 0.83 | 0.82 | 8.18 | 8.19 | |
| 9-Cl-PF3ON | 0.05 | 0.06 | 9.64 | 9.64 | |
| PFNS | 0.50 | 0.54 | 9.83 | 9.83 | |
| PFUnDA | 0.12 | 0.12 | 9.31 | 9.31 | |
| NMeFOSAA | 0.77 | 0.78 | 8.44 | 8.42 | |
| NEtFOSAA | 0.59 | 0.68 | 8.76 | 8.74 | |
| PFDS | 0.38 | 0.37 | 10.53 | 10.53 | |
| PFDOA | 0.17 | 0.18 | 10.02 | 10.02 | |
| 11-Cl-PF3OUdS | 0.02 | 0.02 | 11.03 | 11.06 | |
| PFTrDA | 0.16 | 0.14 | 10.72 | 10.75 | |
| PFTDA | 0.24 | 0.24 | 11.39 | 11.43 | |

## REPORT OF LABORATORY ANALYSIS