# Analytical Laboratory Report

Report ID: S23877.01(01)
Generated on 05/26/2021

Report to

Attention: Don Popma
Biotech Agronomics, Inc.
1651 Bevlah Highway
Bevlah, MI 49617

Phone: 616-835-0100 FAX:
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Report produced by

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Report Summary

Lab Sample ID(s): S23877.01
Project: Caledonia WWTP
Collected Date(s): 05/06/2021
Submitted Date/Time: 05/06/2021 11:16
Sampled by: Don Popma
P.O. #:

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Maya Murshak
Technical Director

## General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

## Report Narrative

There is no additional narrative for this analytical report

**Laboratory Certifications**

| Authority | Certification ID |
|---|---|
| Michigan DEQ | #9956 |
| DOD ELAP/ISO 17025 | #69699 |
| WBENC | #2005110032 |
| Ohio VAP | #CL0002 |
| Indiana DOH | #C-MI-07 |
| New York NELAC | #11814 |
| North Carolina DENR | #680 |
| North Carolina DOH | #26702 |
| Alaska CSLAP | #17-001 |
| Pennsylvania DEP | #68-05884 |

**Qualifier Descriptions**

| Qualifier | Description |
|---|---|
| ! | Result is outside of stated limit criteria |
| B | Compound also found in associated method blank |
| E | Concentration exceeds calibration range |
| F | Analysis run outside of holding time |
| G | Estimated result due to extraction run outside of holding time |
| H | Sample submitted and run outside of holding time |
| I | Matrix interference with internal standard |
| J | Estimated value less than reporting limit, but greater than MDL |
| L | Elevated reporting limit due to low sample amount |
| M | Result reported to MDL not RDL |
| O | Analysis performed by outside laboratory. See attached report. |
| R | Preliminary result |
| S | Surrogate recovery outside of control limits |
| T | No correction for total solids |
| X | Elevated reporting limit due to matrix interference |
| Y | Elevated reporting limit due to high target concentration |
| b | Value detected less than reporting limit, but greater than MDL |
| e | Reported value estimated due to interference |
| j | Analyte also found in associated method blank |
| p | Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak. |
| x | Preserved from bulk sample |

**Glossary of Abbreviations**

| Abbreviation | Description |
|---|---|
| RL/RDL | Reporting Limit |
| MDL | Method Detection Limit |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| SW | EPA SW 846 (Soil and Wastewater) Methods |
| E | EPA Methods |
| SM | Standard Methods |
| LN | Linear |
| BR | Branched |

**Method Summary**

| Method | Version |
|---|---|
| ASTM D7968-17M | ASTM Method D7968 - 17 Modified (Isotopic Dilution) |
| SM2540B | Standard Method 2540 B 2011 |

**Parameter Summary**

| Parameter | Synonym | Cas # |
|---|---|---|
| PFBA | Perfluorobutanoic Acid | 375-22-4 |
| PFPeA | Perfluoropentanoic Acid | 2706-90-3 |
| 4:2 FTSA | 4:2 Fluorotelomer Sulfonic Acid | 757124-72-4 |
| PFHxA | Perfluorohexanoic Acid | 307-24-4 |
| PFBS | Perfluorobutane sulfonic Acid | 375-73-5 |
| PFHpA | Perfluoroheptanoic Acid | 375-85-9 |
| PFPeS | Perfluoropentane Sulfonic Acid | 2706-91-4 |
| 6:2 FTSA | 6:2 Fluorotelomer Sulfonic Acid | 27619-97-2 |
| PFOA | Perfluorooctanoic Acid | 335-67-1 |
| PFHxS | Perfluorohexane Sulfonic Acid | 355-46-4 |
| PFHxS-LN | Perfluorohexane Sulfonic Acid - LN | 355-46-4-LN |
| PFHxS-BR | Perfluorohexane Sulfonic Acid - BR | 355-46-4-BR |
| PFNA | Perfluorononanoic Acid | 375-95-1 |
| 8:2 FTSA | 8:2 Fluorotelomer Sulfonic Acid | 39108-34-4 |
| PFHpS | Perfluoroheptane Sulfonic Acid | 375-92-8 |
| PFDA | Perfluorodecanoic Acid | 335-76-2 |
| N-MeFOSAA | N-methyl perfluorooctanesulfonamidoacetic acid | 2355-31-9 |
| EtFOSAA | N-Ethyl Perfluorooctane Sulfonamidoacetic Acid | 2991-50-6 |
| PFOS | Perfluorooctane Sulfonic Acid | 1763-23-1 |
| PFOS-LN | Perfluorooctane Sulfonic Acid - LN | 1763-23-1-LN |
| PFOS-BR | Perfluorooctane Sulfonic Acid - BR | 1763-23-1-BR |
| PFUnDA | Perfluoroundecanoic Acid | 2058-94-8 |
| PFNS | Perfluorononane Sulfonic Acid | 68259-12-1 |
| PFDoDA | Perfluorododecanoic Acid | 307-55-1 |
| PFDS | Perfluorodecane Sulfonic Acid | 335-77-3 |
| PFTrDA | Perfluorotridecanoic Acid | 72629-94-8 |
| FOSA | Perfluorooctane Sulfonamide | 754-91-6 |
| PFTeDA | Perfluorotetradecanoic Acid | 376-06-7 |
| 11Cl-PF3OUdS | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid | 763051-92-9 |
| 9Cl-PF3ONS | 9-chlorohexadecafluoro-3-oxanone1-sulfonic acid | 756426-58-1 |
| ADONA | 4,8-dioxa-3H-perfluorononanoic acid | 919005-14-4 |
| HFPO-DA | Hexafluoropropylene oxide dimer | 13252-13-6 |

# Analytical Laboratory Report

**Sample Summary (1 samples)**

| Sample ID | Sample Tag | Matrix | Collected Date/Time |
|---|---|---|---|
| S23877.01 | Biosolids | Sludge | 05/06/21 09:25 |

# Analytical Laboratory Report

**Lab Sample ID: S23877.01**
Sample Tag: Biosolids
Collected Date/Time: 05/06/2021 09:25
Matrix: Sludge
COC Reference: 142570

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 15ml Centrifuge Tube | None | Yes | 4.6 | IR |
| 1 | 250ml Plastic | None | Yes | 4.6 | IR |

***Extraction / Prep.***

| Parameter | Result | Method | Run Date | Analyst | Flags |
|---|---|---|---|---|---|
| Initial wt. (g) / Final wt. (g) / Volume (ml)* | 11.06/7.02/10 | ASTM D7968-17M | 05/21/21 11:00 | KCV | |

***Inorganics***

**Method: SM2540B, Run Date: 05/06/21 18:05, Analyst: ELR**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Total Solids* | 1.6 | 1 | | % | 1 | | |

***Organics***

**28 PFAs, Method: ASTM D7968-17M, Run Date: 05/22/21 09:24, Analyst: KCV**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| PFBA* | Not detected | 4.7 | | ug/kg | 155 | 375-22-4 | IX |
| PFPeA* | 2.1 | 1.6 | | ug/kg | 155 | 2706-90-3 | |
| 4:2 FTSA* | Not detected | 1.6 | | ug/kg | 155 | 757124-72-4 | I |
| PFHxA* | 2.6 | 1.6 | | ug/kg | 155 | 307-24-4 | |
| PFBS* | Not detected | 1.6 | | ug/kg | 155 | 375-73-5 | |
| PFHpA* | Not detected | 1.6 | | ug/kg | 155 | 375-85-9 | |
| PFPeS* | Not detected | 1.6 | | ug/kg | 155 | 2706-91-4 | |
| 6:2 FTSA* | Not detected | 1.6 | | ug/kg | 155 | 27619-97-2 | I |
| PFOA* | 6.3 | 1.6 | | ug/kg | 155 | 335-67-1 | |
| PFHxS* | Not detected | 1.6 | | ug/kg | 155 | 355-46-4 | |
| PFHxS-LN* | Not detected | 1.6 | | ug/kg | 155 | 355-46-4-LN | |
| PFHxS-BR* | Not detected | 1.6 | | ug/kg | 155 | 355-46-4-BR | |
| PFNA* | Not detected | 1.6 | | ug/kg | 155 | 375-95-1 | |
| 8:2 FTSA* | Not detected | 1.6 | | ug/kg | 155 | 39108-34-4 | I |
| PFHpS* | Not detected | 1.6 | | ug/kg | 155 | 375-92-8 | |
| PFDA* | 6.8 | 1.6 | | ug/kg | 155 | 335-76-2 | |
| N-MeFOSAA* | 6.9 | 1.6 | | ug/kg | 155 | 2355-31-9 | |
| EtFOSAA* | 9.3 | 1.6 | | ug/kg | 155 | 2991-50-6 | |
| PFOS* | 6.5 | 1.6 | | ug/kg | 155 | 1763-23-1 | |
| PFOS-LN* | 5 | 1.6 | | ug/kg | 155 | 1763-23-1-LN | |
| PFOS-BR* | Not detected | 1.6 | | ug/kg | 155 | 1763-23-1-BR | |
| PFUnDA* | Not detected | 1.6 | | ug/kg | 155 | 2058-94-8 | I |
| PFNS* | Not detected | 1.6 | | ug/kg | 155 | 68259-12-1 | |
| PFDoDA* | 1.7 | 1.6 | | ug/kg | 155 | 307-55-1 | I |
| PFDS* | Not detected | 1.6 | | ug/kg | 155 | 335-77-3 | |
| PFTrDA* | Not detected | 1.6 | | ug/kg | 155 | 72629-94-8 | I |
| FOSA* | Not detected | 1.6 | | ug/kg | 155 | 754-91-6 | |
| PFTeDA* | Not detected | 1.6 | | ug/kg | 155 | 376-06-7 | |
| 11Cl-PF3OUdS* | Not detected | 1.6 | | ug/kg | 155 | 763051-92-9 | |
| 9Cl-PF3ONS* | Not detected | 1.6 | | ug/kg | 155 | 756426-58-1 | |

I-Matrix interference with internal standard X-Elevated reporting limit due to matrix interference

**Lab Sample ID: S23877.01 (continued)**

Sample Tag: Biosolids

**28 PFAs, Method: ASTM D7968-17M, Run Date: 05/22/21 09:24, Analyst: KCV (continued)**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| ADONA* | Not detected | 1.6 | | ug/kg | 155 | 919005-14-4 | |
| HFPO-DA* | Not detected | 1.6 | | ug/kg | 155 | 13252-13-6 | I |

I-Matrix interference with internal standard

# Merit Laboratories Login Checklist

Lab Set ID: S23877
Client: BIOTECHAGRO (Biotech Agronomics, Inc.)
Project: Caledonia WWTP
Submitted: 05/06/2021 11:16 Login User: SRS

Attention: Don Popma
Address: Biotech Agronomics, Inc.
1651 Bevlah Highway
Bevlah, MI 49617

Phone: 616-835-0100 FAX:
Email: dpopma@biotechag.com

| Selection | | | | Description | Note |
|---|---|---|---|---|---|
| **Sample Receiving** | | | | | |
| 01. | [X] Yes | [ ] No | [ ] N/A | Samples are received at 4C +/- 2C Thermometer # | IR 4.6 |
| 02. | [X] Yes | [ ] No | [ ] N/A | Received on ice/ cooling process begun | |
| 03. | [ ] Yes | [X] No | [ ] N/A | Samples shipped | |
| 04. | [ ] Yes | [X] No | [ ] N/A | Samples left in 24 hr. drop box | |
| 05. | [ ] Yes | [ ] No | [X] N/A | Are there custody seals/tape or is the drop box locked | |
| **Chain of Custody** | | | | | |
| 06. | [X] Yes | [ ] No | [ ] N/A | COC adequately filled out | |
| 07. | [X] Yes | [ ] No | [ ] N/A | COC signed and relinquished to the lab | |
| 08. | [X] Yes | [ ] No | [ ] N/A | Sample tag on bottles match COC | |
| 09. | [ ] Yes | [X] No | [ ] N/A | Subcontracting needed? Subcontacted to: | |
| **Preservation** | | | | | |
| 10. | [ ] Yes | [ ] No | [X] N/A | Do sample have correct chemical preservation | |
| 11. | [ ] Yes | [ ] No | [X] N/A | Completed pH checks on preserved samples? (no VOAs) | |
| 12. | [ ] Yes | [X] No | [ ] N/A | Did any samples need to be preserved in the lab? | |
| **Bottle Conditions** | | | | | |
| 13. | [X] Yes | [ ] No | [ ] N/A | All bottles intact | |
| 14. | [X] Yes | [ ] No | [ ] N/A | Appropriate analytical bottles are used | |
| 15. | [X] Yes | [ ] No | [ ] N/A | Merit bottles used | |
| 16. | [X] Yes | [ ] No | [ ] N/A | Sufficient sample volume received | |
| 17. | [ ] Yes | [X] No | [ ] N/A | Samples require laboratory filtration | |
| 18. | [X] Yes | [ ] No | [ ] N/A | Samples submitted within holding time | |
| 19. | [ ] Yes | [ ] No | [X] N/A | Do water VOC or TOX bottles contain headspace | |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

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Phone (517) 332-0167 Fax (517) 332-4034
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C.O.C. PAGE # _____ OF _____ 142570

# CHAIN OF CUSTODY RECORD

## REPORT TO

CONTACT NAME: Don Popma
COMPANY: Biotech Agronomics, Inc.
ADDRESS: 1651 Berlah Hwy.
CITY: Berlah STATE: MI ZIP CODE: 492[illegible]7
PHONE NO.: 616-835-0100 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: dpopma@biotechag.com QUOTE NO.:

## INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: Caledonia WWTP
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Don Popma

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

1 PFAS D7968

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other _____
Special Instructions

| MERIT LAB NO. (FOR LAB USE ONLY) | YEAR 21 DATE | TIME | SAMPLE TAG IDENTIFICATION-DESCRIPTION | MATRIX | # OF BOTTLES | # Containers & Preservatives: NONE | HCl | $HNO_3$ | $H_2SO_4$ | NaOH | MeOH | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23877.01 | 5/6 | 9:25 | biosolids | bs | 4 | 4 | | | | | | |

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Don Popma ☒ Sampler DATE: 5-6-21 TIME: 11:16
RECEIVED BY: SIGNATURE/ORGANIZATION: Sam Smith DATE: 5/6/21 TIME: 1116
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.6

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12