From: Don Popma <dpopma@biotechag.com>
Sent: 7/21/2021 5:08:06 PM
To: "Randy Wurst" <randyw@charlevoixmi.gov>
Cc: "Sneller, Cindy (EGLE)" <SNELLERC@michigan.gov>
Subject: Charlevoix PFAS Results
Attachments: RPT.COC.S25812.01(01)_CHARLEVOIX_WWTP.pdf, QC-S25812-01.pdf

Randy,

Your PFAS results and the QC report is attached. Your PFOS result is 5.9 ppb. So that's great.

You'll need to upload both documents into MIWATERS and let Cindy Sneller w/ Biosolids EGLE know when that is done.

Thanks

Don Popma
General Manager
1651 Beulah Hwy. Beulah MI 49617
Phone (616) 887-4211
Cell (616) 835-0100
Fax (616) 887-9511

BioTech Agronomics, Inc.

ATTACHMENT NAME:

RPT.COC.S25812.01(01)_CHARLEVOIX_WWTP.pdf

ATTACHMENT TYPE:

Adobe Portable Document Format (PDF) compound image

Analytical Laboratory Report

Report ID: S25812.01(01)
Generated on 07/20/2021

Report to

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

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

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S25812.01
Project: Charlevoix WWTP
Collected Date(s): 06/29/2021
Submitted Date/Time: 06/30/2021 12:40
Sampled by: Don Popma
P.O. #:

Table of Contents

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
S25812.01	Biosolids	Sludge	06/29/21 09:20

Analytical Laboratory Report

Lab Sample ID: S25812.01
Sample Tag: Biosolids
Collected Date/Time: 06/29/2021 09:20
Matrix: Sludge
COC Reference: 145922

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.5	IR
1	250ml Plastic	None	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	11.85/6.97/10	ASTM D7968-17M	07/09/21 12:00	JGH	

Inorganics

Method: SM2540B, Run Date: 06/30/21 16:30, Analyst: ELR

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	3.7	1		%	1		

Organics

28 PFAs, Method: ASTM D7968-17M, Run Date: 07/10/21 01:36, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	1.1		ug/kg	55.4	375-22-4	
PFPeA*	Not detected	0.55		ug/kg	55.4	2706-90-3	
4:2 FTSA*	Not detected	0.55		ug/kg	55.4	757124-72-4	I
PFHxA*	2.1	0.55		ug/kg	55.4	307-24-4	
PFBS*	Not detected	0.55		ug/kg	55.4	375-73-5	
PFHpA*	Not detected	0.55		ug/kg	55.4	375-85-9	
PFPeS*	Not detected	0.55		ug/kg	55.4	2706-91-4	
6:2 FTSA*	Not detected	0.55		ug/kg	55.4	27619-97-2	I
PFOA*	Not detected	0.55		ug/kg	55.4	335-67-1	
PFHxS*	Not detected	0.55		ug/kg	55.4	355-46-4	
PFHxS-LN*	Not detected	0.55		ug/kg	55.4	355-46-4-LN	
PFHxS-BR*	Not detected	0.55		ug/kg	55.4	355-46-4-BR	
PFNA*	Not detected	0.55		ug/kg	55.4	375-95-1	
8:2 FTSA*	0.71	0.55		ug/kg	55.4	39108-34-4	I
PFHpS*	Not detected	0.55		ug/kg	55.4	375-92-8	
PFDA*	2.6	0.55		ug/kg	55.4	335-76-2	I
N-MeFOSAA*	19	0.55		ug/kg	55.4	2355-31-9	I
EtFOSAA*	8.2	0.55		ug/kg	55.4	2991-50-6	I
PFOS*	5.9	0.55		ug/kg	55.4	1763-23-1	I
PFOS-LN*	5	0.55		ug/kg	55.4	1763-23-1-LN	I
PFOS-BR*	0.8	0.55		ug/kg	55.4	1763-23-1-BR	I
PFUnDA*	1.8	0.55		ug/kg	55.4	2058-94-8	I
PFNS*	Not detected	0.55		ug/kg	55.4	68259-12-1	I
PFDoDA*	2.2	0.55		ug/kg	55.4	307-55-1	I1
PFDS*	Not detected	0.55		ug/kg	55.4	335-77-3	I
PFTrDA*	0.6	0.55		ug/kg	55.4	72629-94-8	I1
FOSA*	1.4	0.55		ug/kg	55.4	754-91-6	I
PFTeDA*	0.78	0.55		ug/kg	55.4	376-06-7	I1
11Cl-PF3OUdS*	Not detected	0.55		ug/kg	55.4	763051-92-9	

I-Matrix interference with internal standard
1-IS recovery <10%

Lab Sample ID: S25812.01 (continued)

Sample Tag: Biosolids

28 PFAs, Method: ASTM D7968-17M, Run Date: 07/10/21 01:36, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
9Cl-PF3ONS*	Not detected	0.55		ug/kg	55.4	756426-58-1	
ADONA*	Not detected	0.55		ug/kg	55.4	919005-14-4	
HFPO-DA*	Not detected	0.55		ug/kg	55.4	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID: S25812
Client: BIOTECHAGRO (Biotech Agronomics, Inc.)
Project: Charlevoix WWTP
Submitted: 06/30/2021 12:40 Login User: MMC

Attention: Don Popma
Address: Biotech Agronomics, Inc.
1651 Beulah Highway
Beulah, 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 5.5
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.	[X] Yes	[ ] No	[ ] 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: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____ 145922

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Don Popma
COMPANY: BioTech Agronomics, Inc.
ADDRESS: 1651 Beulah Hwy
CITY: Beulah STATE: MI ZIP CODE: 49617
PHONE NO.: 616-835-0100 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: dpopma@biotechag.com QUOTE NO.:

INVOICE TO

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

PROJECT NO./NAME: Charlevoix 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)

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	PFAS D7968	
25812.01	6/29	9:20	Biosolids	bs	4	4							X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Don Popma ☒ Sampler DATE: 6/30/21 TIME: 12:40p
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 6/30/21 TIME: 12:40
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 5.5

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

Rev. 5.18.12

ATTACHMENT NAME:

QC-S25812-01.pdf

ATTACHMENT TYPE:

Adobe Portable Document Format (PDF) compound image

Quality Control Report

Report ID: QC-S25812-01
Generated on 07/20/2021

Report to

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

Phone: 616-835-0100 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S25812.01
Project: Charlevoix WWTP
Submitted Date/Time: 06/30/2021 12:40
Sampled by: Don Popma
P.O. #:

QC Report Sections

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S25812.01
Sample Tag: Biosolids
Collected Date/Time: 06/29/2021 09:20
Matrix: Sludge
COC Reference: 145922

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Total Solids	SM2540B	06/30/21 16:30	TS210630E	TS210630E	No	BLK/LCS/DUP
Organics - Volatiles						
28 PFAs	ASTM D7968-17M	07/10/21 01:36	AK210709	PF210709S1	Yes	BLK/LCS/LCSD/MS/DU

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: TS210630E

Surrogates: No, QC Types: BLK/LCS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S25812.01	Total Solids	SM2540B	06/30/21 16:30	TS210630E

Organics - Volatiles, Prep Batch ID: PF210709S1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S25812.01	28 PFAs	ASTM D7968-17M	07/10/21 01:36	AK210709

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S25812.01

Sample Tag: Biosolids

Collected Date/Time: 06/29/2021 09:20

Matrix: Sludge

COC Reference: 145922

Organics - Volatiles, Analysis: 28 PFAs

Run in Batch: AK210709, Run Date: 07/10/2021 01:36, Matrix: SO, Dilution: 55.4

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA	*	**555.3**	50.0	150.0
M2-6:2FTSA	*	**954.9**	50.0	150.0
M2-8:2FTSA	*	**300.9**	50.0	150.0
M2PFTeDA	*	**7.5**	12.0	218.0
M3PFBS		**94.0**	50.0	150.0
M3PFHxS		**86.9**	50.0	150.0
M4PFHpA		**100.0**	50.0	150.0
M5PFHxA		**98.5**	50.0	150.0
M5PFPeA		**96.7**	50.0	150.0
M6PFDA	*	**34.9**	50.0	150.0
M7PFUnDA	*	**19.1**	50.0	150.0
M8FOSA	*	**43.5**	50.0	150.0
M8PFOA		**92.2**	50.0	150.0
M8PFOS	*	**42.4**	50.0	150.0
M9-PFNA		**94.5**	50.0	150.0
MPFBA		**69.2**	50.0	150.0
MPFDoDA	*	**9.9**	50.0	150.0
d3N-MeFOSAA	*	**23.3**	50.0	150.0
d5EtFOSAA	*	**31.1**	50.0	150.0
MHFPO-DA		**73.0**	50.0	150.0

Organics - Volatiles, Prep Batch ID: PF210709S1

QC Types: BLK/LCS/LCSD/MS/DUP

Blank (BLK)

Lab Sample ID: AK210709.BLKS2107091

Run in Batch: AK210709, Run Date: 07/09/2021 19:06, Prep Date: 07/09/2021, Matrix: SO, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		**100.7**	50.0	150.0
M2-6:2FTSA		**118.6**	50.0	150.0
M2-8:2FTSA		**84.6**	50.0	150.0
M2PFTeDA		**174.2**	12.0	218.0
M3PFBS		**109.3**	50.0	150.0
M3PFHxS		**94.8**	50.0	150.0
M4PFHpA		**118.0**	50.0	150.0
M5PFHxA		**117.9**	50.0	150.0
M5PFPeA		**113.1**	50.0	150.0
M6PFDA		**111.3**	50.0	150.0
M7PFUnDA		**104.6**	50.0	150.0
M8FOSA		**118.6**	50.0	150.0
M8PFOA		**109.2**	50.0	150.0
M8PFOS		**105.2**	50.0	150.0
M9-PFNA		**128.3**	50.0	150.0
MPFBA		**114.5**	50.0	150.0
MPFDoDA		**125.9**	50.0	150.0
d3N-MeFOSAA		**119.3**	50.0	150.0
d5EtFOSAA		**111.2**	50.0	150.0
MHFPO-DA		**104.3**	50.0	150.0

Blank (BLK)

Lab Sample ID: AK210712B.BLKS2107091

Run in Batch: AK210712B, Run Date: 07/12/2021 17:33, Prep Date: 07/09/2021, Matrix: SO, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		**94.4**	50.0	150.0
M2-6:2FTSA		**110.7**	50.0	150.0
M2-8:2FTSA		**98.5**	50.0	150.0
M2PFTeDA		**137.6**	12.0	218.0
M3PFBS		**110.1**	50.0	150.0
M3PFHxS		**95.6**	50.0	150.0
M4PFHpA		**100.4**	50.0	150.0
M5PFHxA		**113.9**	50.0	150.0
M5PFPeA		**106.5**	50.0	150.0
M6PFDA		**112.5**	50.0	150.0
M7PFUnDA		**123.4**	50.0	150.0
M8FOSA		**111.1**	50.0	150.0
M8PFOA		**112.4**	50.0	150.0
M8PFOS		**110.1**	50.0	150.0
M9-PFNA		**114.2**	50.0	150.0
MPFBA		**107.0**	50.0	150.0
MPFDoDA		**123.2**	50.0	150.0
d3N-MeFOSAA		**109.9**	50.0	150.0
d5EtFOSAA		**117.0**	50.0	150.0
MHFPO-DA		**111.1**	50.0	150.0

QC Report - Internal Standards per QC Sample

Laboratory Control Sample (LCS)

Lab Sample ID: AK210712B.LCSS2107091

Run in Batch: AK210712B, Run Date: 07/12/2021 16:54, Prep Date: 07/09/2021, Matrix: SO, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		**95.7**	50.0	150.0
M2-6:2FTSA		**114.6**	50.0	150.0
M2-8:2FTSA		**109.5**	50.0	150.0
M2PFTeDA		**127.9**	12.0	218.0
M3PFBS		**105.7**	50.0	150.0
M3PFHxS		**100.9**	50.0	150.0
M4PFHpA		**108.0**	50.0	150.0
M5PFHxA		**105.7**	50.0	150.0
M5PFPeA		**100.7**	50.0	150.0
M6PFDA		**102.7**	50.0	150.0
M7PFUnDA		**117.1**	50.0	150.0
M8FOSA		**98.7**	50.0	150.0
M8PFOA		**117.9**	50.0	150.0
M8PFOS		**102.5**	50.0	150.0
M9-PFNA		**107.7**	50.0	150.0
MPFBA		**104.4**	50.0	150.0
MPFDoDA		**107.7**	50.0	150.0
d3N-MeFOSAA		**108.0**	50.0	150.0
d5EtFOSAA		**111.7**	50.0	150.0
MHFPO-DA		**112.4**	50.0	150.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: AK210712B.LCSDS2107091, Parent Sample ID: AK210712B.LCSS2107091

Run in Batch: AK210712B, Run Date: 07/12/2021 17:14, Prep Date: 07/09/2021, Matrix: SO, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		**95.2**	50.0	150.0
M2-6:2FTSA		**112.7**	50.0	150.0
M2-8:2FTSA		**104.6**	50.0	150.0
M2PFTeDA		**135.6**	12.0	218.0
M3PFBS		**109.3**	50.0	150.0
M3PFHxS		**98.6**	50.0	150.0
M4PFHpA		**106.5**	50.0	150.0
M5PFHxA		**105.1**	50.0	150.0
M5PFPeA		**104.1**	50.0	150.0
M6PFDA		**115.3**	50.0	150.0
M7PFUnDA		**116.2**	50.0	150.0
M8FOSA		**99.3**	50.0	150.0
M8PFOA		**108.5**	50.0	150.0
M8PFOS		**112.3**	50.0	150.0
M9-PFNA		**116.9**	50.0	150.0
MPFBA		**104.7**	50.0	150.0
MPFDoDA		**117.6**	50.0	150.0
d3N-MeFOSAA		**117.3**	50.0	150.0
d5EtFOSAA		**109.6**	50.0	150.0
MHFPO-DA		**122.6**	50.0	150.0

QC Report - Internal Standards per QC Sample

Matrix Spike (MS)

Lab Sample ID: AK210709.2583209M, Parent Sample ID: S25832.09

Run in Batch: AK210709, Run Date: 07/10/2021 01:16, Prep Date: 07/09/2021, Matrix: SO, Dilution: 5.66

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		**142.3**	50.0	150.0
M2-6:2FTSA	*	**167.1**	50.0	150.0
M2-8:2FTSA		**140.8**	50.0	150.0
M2PFTeDA		**206.9**	12.0	218.0
M3PFBS		**118.8**	50.0	150.0
M3PFHxS		**113.3**	50.0	150.0
M4PFHpA		**112.9**	50.0	150.0
M5PFHxA		**114.5**	50.0	150.0
M5PFPeA		**106.3**	50.0	150.0
M6PFDA		**113.8**	50.0	150.0
M7PFUnDA		**130.5**	50.0	150.0
M8FOSA		**112.7**	50.0	150.0
M8PFOA		**118.6**	50.0	150.0
M8PFOS		**115.2**	50.0	150.0
M9-PFNA		**133.0**	50.0	150.0
MPFBA		**110.1**	50.0	150.0
MPFDoDA		**149.9**	50.0	150.0
d3N-MeFOSAA		**103.2**	50.0	150.0
d5EtFOSAA		**110.3**	50.0	150.0
MHFPO-DA		**90.4**	50.0	150.0

Duplicate (DUP)

Lab Sample ID: AK210712B.2583208D, Parent Sample ID: S25832.08

Run in Batch: AK210712B, Run Date: 07/12/2021 19:50, Prep Date: 07/09/2021, Matrix: SO, Dilution: 5.19

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		**108.0**	50.0	150.0
M2-6:2FTSA		**125.2**	50.0	150.0
M2-8:2FTSA		**116.8**	50.0	150.0
M2PFTeDA		**133.0**	12.0	218.0
M3PFBS		**104.2**	50.0	150.0
M3PFHxS		**102.3**	50.0	150.0
M4PFHpA		**103.6**	50.0	150.0
M5PFHxA		**103.8**	50.0	150.0
M5PFPeA		**100.4**	50.0	150.0
M6PFDA		**116.4**	50.0	150.0
M7PFUnDA		**121.7**	50.0	150.0
M8FOSA		**101.4**	50.0	150.0
M8PFOA		**112.6**	50.0	150.0
M8PFOS		**100.7**	50.0	150.0
M9-PFNA		**104.6**	50.0	150.0
MPFBA		**102.1**	50.0	150.0
MPFDoDA		**124.7**	50.0	150.0
d3N-MeFOSAA		**106.6**	50.0	150.0
d5EtFOSAA		**104.0**	50.0	150.0
MHFPO-DA		**103.6**	50.0	150.0

Inorganics, Prep Batch ID: TS210630E

Surrogates: No, QC Types: BLK/LCS/DUP

Blank (BLK)

Lab Sample ID: TS210630E.LRB1

Run in Batch: TS210630E, Run Date: 06/30/2021 16:30, Prep Date: 06/30/2021, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Solids		ND	1	%

Laboratory Control Sample (LCS)

Lab Sample ID: TS210630E.LCS1

Run in Batch: TS210630E, Run Date: 06/30/2021 16:30, Prep Date: 06/30/2021, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Solids		100	90	110

Duplicate (DUP)

Lab Sample ID: TS210630E.DP1, Parent Sample ID: S25806.04

Run in Batch: TS210630E, Run Date: 06/30/2021 16:30, Prep Date: 06/30/2021, Matrix: Soil, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Solids		0	5

Organics - Volatiles, Prep Batch ID: PF210709S1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Blank (BLK)

Lab Sample ID: AK210709.BLKS2107091

Run in Batch: AK210709, Run Date: 07/09/2021 19:06, Prep Date: 07/09/2021, Matrix: SO, Dilution: 1

Analyte	Flags	Conc	RDL	Units
PFBA		ND	20	ng/kg
PFPeA		ND	10	ng/kg
4:2 FTSA		ND	10	ng/kg
PFHxA		ND	10	ng/kg
PFBS		ND	10	ng/kg
HFPO-DA		ND	10	ng/kg
PFHpA		ND	10	ng/kg
PFPeS		ND	10	ng/kg
ADONA		ND	10	ng/kg
6:2 FTSA		ND	10	ng/kg
PFOA		ND	10	ng/kg
PFHxS-BR		ND	10	ng/kg
PFHxS		ND	10	ng/kg
PFHxS-LN		ND	10	ng/kg
PFNA		ND	10	ng/kg
8:2 FTSA		ND	10	ng/kg
PFHpS		ND	10	ng/kg
N-MeFOSAA		ND	10	ng/kg
PFDA		ND	10	ng/kg
PFOS-BR		ND	10	ng/kg
EtFOSAA		ND	10	ng/kg
PFOS		ND	10	ng/kg
PFOS-LN		ND	10	ng/kg
PFUnDA		ND	10	ng/kg
9CL-PF3ONS		ND	10	ng/kg
PFNS		ND	10	ng/kg
PFDoDA		ND	10	ng/kg
PFDS		ND	10	ng/kg
PFTrDA		ND	10	ng/kg
11CL-PF3OUdS		ND	10	ng/kg
FOSA		ND	10	ng/kg
PFTeDA		ND	10	ng/kg

Blank (BLK)

Lab Sample ID: AK210712B.BLKS2107091

Run in Batch: AK210712B, Run Date: 07/12/2021 17:33, Prep Date: 07/09/2021, Matrix: SO, Dilution: 1

Analyte	Flags	Conc	RDL	Units
PFBA		ND	20	ng/kg
PFPeA		ND	10	ng/kg
4:2 FTSA		ND	10	ng/kg
PFHxA		ND	10	ng/kg
PFBS		ND	10	ng/kg
HFPO-DA		ND	10	ng/kg
PFHpA		ND	10	ng/kg
PFPeS		ND	10	ng/kg
ADONA		ND	10	ng/kg

Organics - Volatiles, Prep Batch ID: PF210709S1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Blank (BLK) (continued)

Lab Sample ID: AK210712B.BLKS2107091

Run in Batch: AK210712B, Run Date: 07/12/2021 17:33, Prep Date: 07/09/2021, Matrix: SO, Dilution: 1

Analyte	Flags	Conc	RDL	Units
6:2 FTSA		ND	10	ng/kg
PFOA		ND	10	ng/kg
PFHxS-BR		ND	10	ng/kg
PFHxS-LN		ND	10	ng/kg
PFHxS		ND	10	ng/kg
PFNA		ND	10	ng/kg
8:2 FTSA		ND	10	ng/kg
PFHpS		ND	10	ng/kg
PFDA		ND	10	ng/kg
N-MeFOSAA		ND	10	ng/kg
PFOS-BR		ND	10	ng/kg
EtFOSAA		ND	10	ng/kg
PFOS		ND	10	ng/kg
PFOS-LN		ND	10	ng/kg
PFUnDA		ND	10	ng/kg
9CL-PF3ONS		ND	10	ng/kg
PFNS		ND	10	ng/kg
PFDoDA		ND	10	ng/kg
PFDS		ND	10	ng/kg
PFTrDA		ND	10	ng/kg
FOSA		ND	10	ng/kg
11CL-PF3OUdS		ND	10	ng/kg
PFTeDA		ND	10	ng/kg

Laboratory Control Sample (LCS)

Lab Sample ID: AK210712B.LCSS2107091

Run in Batch: AK210712B, Run Date: 07/12/2021 16:54, Prep Date: 07/09/2021, Matrix: SO, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
PFBA		106.0	70.0	130.0
PFPeA		103.0	70.0	130.0
4:2 FTSA		112.0	70.0	130.0
PFHxA		100.0	70.0	130.0
PFBS		113.0	70.0	130.0
HFPO-DA		104.0	70.0	130.0
PFHpA		93.8	70.0	130.0
PFPeS		112.0	70.0	130.0
ADONA		90.5	70.0	130.0
6:2 FTSA		105.0	70.0	130.0
PFOA		92.5	70.0	130.0
PFHxS		107.0	70.0	130.0
PFNA		93.9	70.0	130.0
8:2 FTSA		115.0	70.0	130.0
PFHpS		87.9	70.0	130.0
PFDA		111.0	70.0	130.0
N-MeFOSAA		112.0	70.0	130.0
EtFOSAA		103.0	70.0	130.0

Organics - Volatiles, Prep Batch ID: PF210709S1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: AK210712B.LCSS2107091

Run in Batch: AK210712B, Run Date: 07/12/2021 16:54, Prep Date: 07/09/2021, Matrix: SO, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
PFOS		81.4	70.0	130.0
PFUnDA		97.0	70.0	130.0
9CL-PF3ONS		97.3	70.0	130.0
PFNS		98.1	70.0	130.0
PFDoDA		100.0	70.0	130.0
PFDS		94.0	70.0	130.0
PFTrDA		113.0	70.0	130.0
FOSA		106.0	70.0	130.0
11CL-PF3OUdS		118.0	70.0	130.0
PFTeDA		94.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: AK210712B.LCSDS2107091, Parent Sample ID: AK210712B.LCSS2107091

Run in Batch: AK210712B, Run Date: 07/12/2021 17:14, Prep Date: 07/09/2021, Matrix: SO, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
PFBA		103.0	70.0	130.0	2.9	30.0
PFPeA		97.2	70.0	130.0	5.8	30.0
4:2 FTSA		113.0	70.0	130.0	0.9	30.0
PFHxA		96.1	70.0	130.0	4.0	30.0
PFBS		111.0	70.0	130.0	1.8	30.0
HFPO-DA		106.0	70.0	130.0	1.9	30.0
PFHpA		93.9	70.0	130.0	0.1	30.0
PFPeS		96.3	70.0	130.0	15.1	30.0
ADONA		111.0	70.0	130.0	20.3	30.0
6:2 FTSA		100.0	70.0	130.0	4.9	30.0
PFOA		98.8	70.0	130.0	6.6	30.0
PFHxS		111.0	70.0	130.0	3.7	30.0
PFNA		80.9	70.0	130.0	14.9	30.0
8:2 FTSA		101.0	70.0	130.0	13.0	30.0
PFHpS		97.4	70.0	130.0	10.3	30.0
PFDA		96.7	70.0	130.0	13.8	30.0
N-MeFOSAA		114.0	70.0	130.0	1.8	30.0
EtFOSAA		112.0	70.0	130.0	8.4	30.0
PFOS		73.5	70.0	130.0	10.2	30.0
PFUnDA		98.6	70.0	130.0	1.6	30.0
9CL-PF3ONS		92.8	70.0	130.0	4.7	30.0
PFNS		82.1	70.0	130.0	17.8	30.0
PFDoDA		105.0	70.0	130.0	4.9	30.0
PFDS		84.7	70.0	130.0	10.4	30.0
PFTrDA		102.0	70.0	130.0	10.2	30.0
FOSA		104.0	70.0	130.0	1.9	30.0
11CL-PF3OUdS		106.0	70.0	130.0	10.7	30.0
PFTeDA		84.0	70.0	130.0	12.1	30.0

Organics - Volatiles, Prep Batch ID: PF210709S1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Matrix Spike (MS)

Lab Sample ID: AK210709.2583209M, Parent Sample ID: S25832.09

Run in Batch: AK210709, Run Date: 07/10/2021 01:16, Prep Date: 07/09/2021, Matrix: SO, Dilution: 5.66

Analyte	Flags	% Rec	LCL	UCL
PFBA	*	130.7	70.0	130.0
PFPeA		116.6	70.0	130.0
4:2 FTSA		120.1	70.0	130.0
PFHxA	*	130.7	70.0	130.0
PFBS		116.6	70.0	130.0
PFHpA		123.7	70.0	130.0
PFPeS		109.5	70.0	130.0
6:2 FTSA		98.9	70.0	130.0
PFOA	*	134.3	70.0	130.0
PFHxS		127.2	70.0	130.0
PFNA		116.6	70.0	130.0
8:2 FTSA		106.0	70.0	130.0
PFHpS		95.4	70.0	130.0
PFDA	*	144.9	70.0	130.0
N-MeFOSAA		127.2	70.0	130.0
EtFOSAA		91.9	70.0	130.0
PFOS	*	10.6	70.0	130.0
PFUnDA		114.1	70.0	130.0
PFNS		109.5	70.0	130.0
PFDoDA		98.9	70.0	130.0
PFDS	*	-70.7	70.0	130.0
PFTrDA		116.6	70.0	130.0
FOSA		120.1	70.0	130.0
PFTeDA		95.4	70.0	130.0
11CL-PF3OUdS		116.6	70.0	130.0
9CL-PF3ONS		102.5	70.0	130.0
ADONA		106.0	70.0	130.0
HFPO-DA		116.6	70.0	130.0

Duplicate (DUP)

Lab Sample ID: AK210712B.2583208D, Parent Sample ID: S25832.08

Run in Batch: AK210712B, Run Date: 07/12/2021 19:50, Prep Date: 07/09/2021, Matrix: SO, Dilution: 5.19

Analyte	Flags	RPD	RPD CL
PFBA		NC	30.0
PFPeA		NC	30.0
4:2 FTSA		NC	30.0
PFHxA		NC	30.0
PFBS		NC	30.0
PFHpA		NC	30.0
PFPeS		NC	30.0
6:2 FTSA		NC	30.0
PFOA		NC	30.0
PFHxS		NC	30.0
PFHxS-LN		NC	30.0
PFHxS-BR		NC	30.0
PFNA		NC	30.0

Organics - Volatiles, Prep Batch ID: PF210709S1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Duplicate (DUP) (continued)

Lab Sample ID: AK210712B.2583208D, Parent Sample ID: S25832.08

Run in Batch: AK210712B, Run Date: 07/12/2021 19:50, Prep Date: 07/09/2021, Matrix: SO, Dilution: 5.19

Analyte	Flags	RPD	RPD CL
8:2 FTSA		NC	30.0
PFHpS		NC	30.0
PFDA		NC	30.0
N-MeFOSAA		NC	30.0
EtFOSAA		NC	30.0
PFOS		NC	30.0
PFOS-LN		NC	30.0
PFOS-BR		NC	30.0
PFUnDA		NC	30.0
PFNS		NC	30.0
PFDoDA		NC	30.0
PFDS		NC	30.0
PFTrDA		NC	30.0
FOSA		NC	30.0
PFTeDA		NC	30.0
11CL-PF3OUdS		NC	30.0
9CL-PF3ONS		NC	30.0
ADONA		NC	30.0
HFPO-DA		NC	30.0

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____ 145922

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Don Popma
COMPANY: BioTech Agronomics, Inc.
ADDRESS: 1651 Beulah Hwy
CITY: Beulah STATE: MI ZIP CODE: 49617
PHONE NO.: 616-835-0100 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: dpopma@biotechag.com QUOTE NO.:

INVOICE TO

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

PROJECT NO./NAME: Charlevoix 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)

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	PFAS D7968	
25812.01	6/29	9:20	Biosolids	bs	4	4							X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Don Popma ☒ Sampler DATE: 6/30/21 TIME: 12:40p
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 6/30/21 TIME: 12:40
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 5.5

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

Rev. 5.18.12