AECOM Imagine it. Delivered.

Evaluation of Bronson Wastewater Treatment Plant (WWTP) Biosolids Land Application Sites 07S08W10-CA03, 07S08W11-CA04 & CA05

Branch County, Michigan

Project Number: 60588767

Prepared for
Michigan Department of Environment, Great Lakes, and Energy

April 2021

Prepared for:

Michigan Department of Environment, Great Lakes, and Energy
Water Resources Division
Stephanie Kammer
Constitution Hall, 1st Floor, South Tower
525 West Allegan Street
P.O. Box 30242
Lansing, MI 48909

Prepared by:

Dorin Bogdan, Ph.D.
PFAS Technical Practice Group Leader
Environmental Engineer, Michigan
E: dorin.bogdan@aecom.com

AECOM
3950 Sparks Drive Southeast
Grand Rapids, MI 49546
aecom.com

Table of Contents

Figures

Tables

Appendices

1. Introduction

This technical memorandum summarizes and reports the findings of site investigations conducted at land application Sites 07S08W10-CA03 (Site CA03), 07S08W11-CA04 (Site CA04), and 07S08W11-CA05 (Site CA05) (**Figure 1**). The purpose of the investigation was to determine the impact, if any, from the land application of Per- and Polyfluoroalkyl Substances (PFAS)-impacted biosolids from the Bronson Wastewater Treatment Plant (WWTP) in the soil, groundwater, and adjacent surface water bodies.

The field investigation activities were designed to characterize soil, groundwater, and surface water conditions and collect data to evaluate the risk to human health and the environment from applying potential PFAS-impacted biosolids. A review of existing data was used to guide the scope of this investigation. Field investigation activities at the Site included soil, groundwater, and surface water sampling activities.

2. Background

Site CA03 is a 22-acre field located southeast of Sackett Road and Prairie River Road in Bronson, Michigan, approximately two (2) miles west of the Bronson WWTP. Site CA04, a nine (9)-acre field, and Site CA05, a 45-acre field, are located southwest of Sackett Road and Burr Oak Road in Bronson, Michigan, approximately one (1) mile west of the Bronson WWTP. Site CA04 is a small dog-leg shaped field to the south of Site CA05. Site CA04 was sometimes previously managed and reported as part of Site CA05. All sites are owned and farmed by the same landowner/farmer.

Application to apply biosolids from the Bronson WWTP to Sites CA03, CA04, and CA05 was first received by the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division (WRD) in 1997. Records indicate Site CA03 received 203.89 dry tons (dT) of biosolids from six (6) applications by the Bronson WWTP from 2003 through 2014. Applications were consistent across the entire acreage of the Site and were relatively light or moderate, ranging from 24 to 48 dT per year and application rates of 1.23 to 2.44 dT per acre. The average application rate was 1.74 dT per acre. Site CA04 received 39.16 dT of biosolids from two (2) applications in 2001 and 2017. These applications were somewhat consistent in acreage used and moderate in application rate, roughly 10 and 28 dT per year, and application rates of 2.05 and 3.21 dT per acre. Site CA05 received 440.64 dT of biosolids during nine (9) applications from 2005 through 2017. Applications were often not consistent across the entire acreage of the Site and were relatively light, ranging from 15 to 76 dT per year, and application rates of 0.63 to 1.69 dT per acre. The application of biosolids for all three (3) sites are presented in **Table 1**.

The investigation conducted by AECOM on behalf of EGLE was performed in accordance with applicable AECOM, EGLE, and US Environmental Protection Agency (USEPA) guidance documents, including the Scope of Work and the Quality Assurance Project Plan (QAPP), previously developed in 2018.

The USEPA has classified PFAS as emerging contaminants that are regulated by EGLE under Part 201, Environmental Remediation, and Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, Act 451 of 1994, as amended and their respective administrative rules, specifically Rule 299.44-299.50 (Generic Cleanup Criteria) and Rule 323.1057 (Rule 57) (Toxic Substances) of the Michigan Administrative Code. PFAS are a

complex family of more than 4,750 human-made fluorinated organic chemicals. Due to their unique chemical properties, PFAS have been used in many industries and consumer products since the late 1950s. The Interstate Technology Regulatory Council (ITRC) has identified four primary sources of PFAS: fire training/fire response sites, industrial sites, landfills, and wastewater treatment plants/biosolids.

AECOM initially sampled the effluent, influent, and biosolids from the Bronson WWTP on October 31, 2018. The Bronson WWTP has an approved Industrial Pretreatment Program (IPP) and authorization to discharge treated municipal wastewater under NPDES permit number MI0020729. In the spring of 2018, WRD required all municipal WWTPs with approved IPPs to participate in an IPP PFAS Initiative to evaluate their industrial users for discharges of PFAS. In May of 2018, the Bronson WWTP identified an industrial user, a chrome plating facility, as a significant source of perfluorooctanesulfonic acid (PFOS) to their facility and elevated levels of PFOS in the effluent and subsequently, in August of 2018, in the biosolids from the WWTP. Based on this information, the Bronson WWTP was included in a statewide WWTP PFAS assessment to provide a range of possible PFAS impacts in WWTPs with industrial discharges. The influent and effluent wastewater and anaerobically digested biosolids were sampled for 24 PFAS compounds recommended by EGLE as the PFAS Minimum Laboratory Analyte List. The influent and effluent wastewater have been sampled frequently since May 2018 during approximately 30 sampling events. The results from the sampling events are summarized below, listed as the range of values detected by year. The sampling initially detected higher results of PFOS in 2018 and then similar perfluorooctanoic acid (PFOA) and PFOS results between events in 2018, 2019, and 2020 once treatment was installed to remove PFOS at the point of discharge from the industrial user. However, in 2019 a different lab was used, and the detection limits were slightly higher than those from 2018 and 2020. The effluent samples from the Bronson WWTP periodically exceeded the Rule 57 Water Quality Standards (WQS) for a surface water body not used as a drinking water source of 12 ng/L for PFOS but did not exceed the WQS of 12,000 ng/L for PFOA.

Sample Location	Sample Year	PFOA[1] (detection range)	PFOS[1] (detection range)
Influent	2018	< 2.0	8 – 843
Influent	2019	< 2.0 – 3.0	3.9 - 110
Influent	2020	< 2.0 – 1.9	5.3 - 20
Effluent	2018	2.2 – 7.7	37 – 360
Effluent	2019	< 2.0 – 6.9	4.6 - 25
Effluent	2020	< 2.0 – 3.4	6.9 - 13
Biosolids	2018	< 8.2 – 3.86	970 – 1,060
Biosolids	2019	24	6,500
Biosolids	2020	< 5.0	72-100

[1]Units for aqueous samples are in nanograms per liter (ng/L) or parts per trillion (ppt), and for the solids are in micrograms per kilogram (µg/Kg) or parts per billion (ppb).

Of the WWTPs included in the statewide WWTP PFAS assessment, the Bronson WWTP had some of the highest PFOS concentrations found in impacted biosolids and is expected to represent a worst-case scenario. EGLE conducted an initial, limited investigation in April 2019 at the Bronson Sites CA03, CA04, and CA05 that included eight (8) surface soil samples, nine (9) surface water samples, and two (2) tile drain samples. In January 2020, eight (8) groundwater samples were collected from eight (8) monitoring wells installed at four locations (**Figures 2a, 2b)**.

The analytical results from sampling the influent, effluent, and biosolids at the Bronson WWTP represents only the conditions at the time of sampling. There is not enough historic information to accurately estimate the concentrations of PFOA and PFOS within the Bronson WWTP in the past, including the biosolids. It is documented that PFOA and PFOS were much more widely used in the past. As a result, concentrations in all environmental matrices found in agricultural fields where Bronson WWTP biosolids were land applied in the past may not be closely correlated to current concentrations found within the WWTP. However, biosolids associated with IPP WWTPs are expected to have higher PFAS concentrations than those from non-IPP WWTPs. The Bronson WWTP and agricultural fields CA03, CA04, and CA05, were selected to compare with other WWTPs and agricultural fields that participate in the IPP that had lower PFAS concentrations in their biosolids and non-IPP WWTPs and agricultural fields.

3. Hydrogeology/Geology

The geology and topography of Sites CA03, CA04, and CA05 are the result of glacial activity. The glacial aquifers consist of sand and gravel that are part of a thick sequence of Pleistocene glacial deposits (**Figure 8**). The area is composed of end moraines of coarse-textured till and lacustrine deposits that are predominately composed of loamy sand. Soil borings installed during the investigation generally encountered surficial sand containing silt and/or gravel intermixed by less than five (5) feet of lean or fat clay. Soil boring logs are provided in **Appendix A**.

At Site CA03, the USDA Natural Resources Conservation Service Web Soil Survey identified (3) three primary types of surface soils from where samples were collected. The surface soils are described as the Gilford sandy loam (6), Adrian muck (20), and Branch loamy sand (25B). The Branch loamy sand and Gilford sandy loam were deposited in outwash plains and drainage channels, consisting of sandy loam over a gravelly outwash. The Adrian muck lithology contains herbaceous organic material over sandy soil from glaciofluvial deposits.

At Sites CA04 and CA05, the USDA Natural Resources Conservation Service Web Soil Survey identified (4) four primary types of surface soils from where the samples were collected. The surface soils are described as the Hillsdale-Riddles fine sandy loams (5B), Locke fine sandy loam (15B), Branch loamy sand (25B), and Matherton sandy loam (9A). All four (4) soil types are from outwash and till plains, with higher loam content over coarse gravel deposits.

Regional groundwater flow is expected to generally be towards surface water bodies such as ponds and streams. The general groundwater elevation map based on EGLE-provided shallow groundwater elevation data is provided in **Figures 6a, 6b,** and indicates groundwater generally flows to the southwest in Sites CA04 and CA05 and to the south in Site CA03.

4. Scope of Work

Soil, groundwater, and surface water samples were collected from the agricultural fields to evaluate the potential PFAS impact from Bronson WWTP biosolids. The soil, groundwater, and surface water samples were submitted to Vista Analytical Laboratory and analyzed for EGLE's recommended minimum analyte list of 24 PFAS compounds provided below, using an isotope dilution method. Soil samples were additionally sent to Test America Laboratory for total organic carbon (TOC) analysis using the Lloyd Kahn Method.

PFAS Name	Carbon Chain length (C#)	Acronym	CAS #
Perfluorobutanoic Acid[1]	C4	PFBA	375-22-4
Perfluoropentanoic Acid[1]	C5	PFPeA	2706-90-3
Perfluorohexanoic Acid[1]	C6	PFHxA	307-24-4
Perfluoroheptanoic Acid[1]	C7	PFHpA	375-85-9
Perfluorooctanoic Acid[1]	C8	PFOA	335-67-1
Perfluorononanoic Acid[1]	C9	PFNA	375-95-1
Perfluorodecanoic Acid[1]	C10	PFDA	335-76-2
Perfluoroundecanoic Acid[1]	C11	PFUnDA	2058-94-8
Perfluorododecanoic Acid[1]	C12	PFDoDA	307-55-1
Perfluorotridecanoic Acid[1]	C13	PFTrDA	72629-94-8
Perfluorotetradecanoic Acid[1]	C14	PFTeDA	376-06-7
Perfluorobutane Sulfonic Acid[2]	C4	PFBS	375-73-5
Perfluoropentane Sulfonic Acid[2]	C5	PFPeS	2706-91-4
Perfluorohexane Sulfonic Acid[2]	C6	PFHxS	355-46-4
Perfluoroheptane Sulfonic Acid[2]	C7	PFHpS	375-92-8
Perfluorooctane Sulfonic Acid[2]	C8	PFOS	1763-23-1
Perfluorononane Sulfonic Acid[2]	C9	PFNS	474511-07-4
Perfluorodecane Sulfonic Acid[2]	C10	PFDS	335-77-3
Perfluorooctane Sulfonamide[3]	C8	FOSA	754-91-6
4:2 Fluorotelomer Sulfonic Acid[4]	C4	4:2 FTSA	757124-72-4
6:2 Fluorotelomer Sulfonic Acid[4]	C6	6:2 FTSA	27619-97-2
8:2 Fluorotelomer Sulfonic Acid[4]	C8	8:2 FTSA	39108-34-4
N-Ethyl Perfluorooctane Sulfonamidoacetic Acid[5]	C8	EtFOSAA	2991-50-6
N-Methyl Perfluorooctane Sulfonamidoacetic Acid[6]	C8	MeFOSAA	2355-31-9

[1]Perfluoroalkyl Carboxylic Acids (PFCAs) Family is composed of the following PFAS: PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUnDA, PFDoDA, PFTrDA, PFTeDA

[2]Perfluoroalkane Sulfonic Acids (PFSAs) Family is composed of the following PFAS: PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFNS, PFDS

[3]Perfluoroalkane Sulfonamides (FASAs) Family is composed of the following PFAS: FOSA

[4](n:2) Fluorotelomer Sulfonic Acids (FTSAs) Family is composed of the following PFAS: 4:2 FTSA, 6:2 FTSA, 8:2 FTSA

[5]N-Ethyl Perfluoroalkane Sulfonamidoacetic Acids (EtFASAAs) Family is composed of the following PFAS: EtFOSAA

[6]N-Methyl Perfluoroalkane Sulfonamidoacetic Acids (MeFASAAs) Family is composed of the following PFAS: MeFOSAA

5. Surface Soil

The locations of soil samples were selected based on previous studies, soil types, surface water flow and were generally biased with the intent of obtaining the highest possible concentrations as a worst-case scenario. A total of eight (8) 50 by 50 feet Decision Units (DUs) were identified for soil sampling. Four (4) DUs were selected within Site CA03, and two (2) DUs were selected within each Site CA04 and Site CA05. The biosolids were assumed to have been applied

consistently at a depth of eight (8) inches across the agricultural fields based on information provided by EGLE. As a result, soil samples were collected for each DU, which consisted of one (1) sample composed of nine (9) aliquots, from a depth of six (6) to eight (8) inches using a ¾" diameter soil sampler core. All nine (9) aliquots from each DU were homogenized into one sample. The eight (8) soil samples were analyzed for PFAS and TOC.

Within Site CA03, the first DU soil sample (CA03-DU1) was sampled within the Branch loamy sand. The second DU (CA03-DU2) was sampled within the Adrian Muck. The third and fourth Decision Units (CA03-DU2 and CA03-DU4) were sampled within the Gilford sandy loam.

Within Site CA04, the first Decision Unit (CA04-DU1) was sampled within the Branch loamy sand. The second Decision Unit (CA04-DU2) was sampled within the Matherton sandy loam. Within Site CA05, the first Decision Unit (CA05-DU1) was sampled within the Hillsdale-Riddles fine sandy loams. The second Decision Unit (CA05-DU) was sampled in the Locke fine sandy loam. The soils identified in the Bronson Sites CA03, CA04, and CA05 are shown in **Figures 2a**, **2b**, and described in **Appendix C**. The analytical results are summarized in the table below and attached in **Table 2** and **Figures 3a**, **3b**.

Soil Sample ID	Sample Date	Field Site	Total PFAS[1]	PFOA[1]	PFOS[1]
SXDU11904081125RL	4/8/2019	CA03-DU1	**16.7**	< 0.961	**15.7**
SXDU21904081210RL	4/8/2019	CA03-DU2	**7.69**	< 0.993	**7.69**
SXDU31904081300RL	4/8/2019	CA03-DU3	**10.4**	< 0.996	**10.4**
SXDU41904081450RL	4/8/2019	CA03-DU4	**0.891**	< 0.978	**0.891**
SXDU11904081825RL	4/8/2019	CA04-DU1	**13.3**	< 0.979	**13.3**
SXDU21904081910RL	4/8/2019	CA04-DU2	**3.92**	< 3.92	**3.92**
SXDU11904081700RL	4/8/2019	CA05-DU1	**7.00**	< 0.967	**7.00**
SXDU21904081755RL	4/8/2019	CA05-DU2	**6.28**	< 0.984	**6.28**

[1]Units are in micrograms per kilogram (µg/Kg) or parts per billion (ppb)

All soil samples collected from the eight (8) DUs had some PFAS compounds detected. Of the 24 PFAS compounds analyzed, only PFOS and PFDS were detected in the samples. PFOS was detected in all eight (8) samples with concentrations of 0.891 to 15.7 µg/Kg, and PFDS was only detected in CA03-DU1, at 1.01 µg/Kg. All (8) eight soil samples were non-detect for PFOA. The area of the highest Total PFAS soil concentrations was CA03-DU1, with the highest total PFAS value of 16.7 µg/Kg. All eight (8) soil samples collected resulted in relatively low total PFAS concentrations (**Table 2**) compared to soil samples collected from other agricultural fields associated with industrially impacted biosolids from other municipal WWTPs with significant industrial sources.

The total organic carbon (TOC) analytical results ranged from 6,500 to 29,000 milligram per kilogram (mg/Kg). The maximum TOC value is associated with CA03-DU2 and the Adrian muck lithology, with a TOC value of 29,000 mg/Kg. The remaining seven (7) DUs sampled resulted in TOC values ranging from 6,500 to 19,000 mg/Kg. **Table 2** summarizes the soil PFAS and TOC data by DU, and **Figures 3a, 3b** shows the Total PFAS concentration and soil classification for each sample.

6. Surface Water

Surface water samples were collected from nine (9) locations from Sites CA03, CA04, and CA05. Two (2) additional water samples were collected from tile drains near Site CA04 and Site CA05. Their results and sampling descriptions are detailed below.

6.1 Tile Drain Sampling

In April 2019, AECOM met with EGLE and the local farmer of fields CA03, CA04, and CA05, where it was discussed that AECOM would sample two (2) drains near Site CA04 and Site CA05. Site CA03 did not have any locations available for this type of sampling. Results are listed in the table below, and **Table 3** and **Figure 4b**.

Tile Drain Sample ID	Sample Date	Field Site	Total PFAS[1]	PFOA[1]	PFOS[1]
TD011904081845MK	4/8/2019	Pipe Near CA04	**13.1**	< 2.07	**4.55**
TD011904081735MK	4/8/2019	CA05 Tile Drain	**9.21**	< 1.98	**1.41**

[1]Units are in nanograms per liter (ng/L) or parts per trillion (ppt)

Both tile drain samples were below Rule 57 WQS for PFOS and PFOA (**Section 10**), with PFOA being non-detect and low concentrations for PFOS (**Table 3**).

6.2 Surface Water Sampling

Surface water samples were collected from seven (7) locations around Site CA03 and one (1) location, each at Sites CA04 and CA05, from either the Swan Creek or neighboring ponds and streams. At Site CA03, two (2) surface water samples were taken from Swan Creek north of the field, four (4) samples were collected from the stream south of the Site, and one (1) surface water sample was collected from the small pond located on the southern edge of the Site. At Site CA04, the single surface water sample was collected on the northwest corner of the field, downstream of the tile drain that was collected. At Site CA05 the single surface water sample was collected from the small neighboring pond located west of the Site. The analytical results are summarized in the table below and attached in **Table 3** and **Figures 4a, 4b**.

Surface Water Sample ID	Sample Date	Field Site	Total PFAS[1]	PFOA[1]	PFOS[1]
SW011904081320MK	4/8/2019	CA03	**1.42**	< 2.06	< 2.06
SW021904081525RL	4/8/2019	CA03	**10.02**	< 2.25	< 2.25
SW031904081510RL	4/8/2019	CA03	**8.03**	< 2.09	**3.06**
SW041904081430MK	4/8/2019	CA03	**2.85**	< 2.11	< 2.11
SW051904081440MK	4/8/2019	CA03	**2.57**	< 2.06	< 2.06
SW061904081335MK	4/8/2019	CA03	**1.47**	< 1.98	< 1.98
SW071904081450MK	4/8/2019	CA03	**3.30**	< 2.12	< 2.12
SW011904081930MK	4/8/2019	CA04	**14.12**	< 2.07	**3.75**
SW011904081700MK	4/8/2019	CA05	**6.65**	< 2.02	**1.43**

[1]Units are in nanograms per liter (ng/L) or parts per trillion (ppt)

All nine (9) surface water samples were below the Rule 57 WQS for PFOS and PFOA (**Section 10**), with PFOA being non-detect and PFOS ranging from non-detect to low concentrations (**Table 3**).

The highest total PFAS concentration was collected from the stream in CA04, downstream of the sampled tile drain. The two (2) lowest total PFAS concentrations were collected from the creek to the northwest of Site CA03, 1.42 and 1.47 ng/L.

7. Groundwater

Between December 19, 2019, and January 6, 2020, AECOM and Mateco Drilling Co. installed eight (8) monitoring wells throughout the Bronson Sites. Before any intrusive work was performed, a utility clearance was conducted by MISS DIG, Michigan's one-call utility locating service. Mateco Drilling Company used Ground Penetrating Technology (GPR) to conduct a sub-surface investigation around the boring site locations. All boring site locations marked by AECOM were cleared. No anomalies were encountered that would suggest any of the sampling locations needed to be relocated.

Four (4) drilling locations were selected across Sites CA03, CA04, and CA05. A pair of shallow (S) and deep (D) wells were installed at each drilling location. At Site CA03, the monitoring wells (CA03-MW1(S, D)) were set on the south border of the Site, adjacent to the bordering southern creek and Adrian Muck lithology. The wells were set downgradient and close to a small pond, which acts as the low point onsite. At Site CA04, a pair of wells (CA04-MW1(S, D)) were set on the northwest corner of the Site, near the CA04 tile drain that was sampled. This location is set upgradient, as the surface water in Site CA04 flows to the southwest. At Site CA05, there are two (2) borings. The first well pair is in the northeast region of Site CA05 (CA05-MW1(S, D)), upstream of groundwater flow as it typically flows southwest. The second pair of monitoring wells (CA05-MW2(S, D)) is set centrally within CA05 and on the west edge. This second location acts as a downgradient zone, close to the small pond.

The scope of work proposed four (4) monitoring well locations be installed in areas outside of the active farming field and where data was needed within the farm fields. The up and downgradient locations of the eight (8) total groundwater wells were selected to provide vertical and horizontal groundwater flow information for PFAS. Monitoring well locations are as shown in **Figures 2a, 2b,** and results are discussed in **Figures 5a, 5b,** and **Table 4**.

7.1 Permanent Monitoring Wells

Mateco Drilling Company completed the soil borings by hand auguring the first five (5) feet below ground surface (bgs) and then using a Geoprobe 7822DT to drill to depth, typically stopping due to refusal or a very hard till-like lithology. Both hand auguring and 2-inch dual tube systems were continuously used to core soils. Cored soils were logged using the Unified Soil Classification System (USCS) from the surface to total depth. Soil boring logs are provided in **Appendix A** and a photolog of the soil cuttings from the borings is provided in **Appendix D.** The initial borehole drilled per location provided lithology until refusal, allowing this borehole to be completed as the deep well at each Site. Once total depth was reached, hollow stem auger drilling was utilized to over drill the soil boring to the final depth. Additionally, an adjacent second borehole was blind drilled using the hollow stem auger to various shallow depths depending on the screen selection from the deep borehole's geologic soil log. The borings ranged in depth from nine (9) to 35 feet bgs.

Monitoring wells were installed through the annulus of the hollow stem augers as the augers were extracted from the ground. Monitoring wells were constructed of 2-inch diameter,

Schedule 40, polyvinyl chloride (PVC) well casing, and 5-foot long, 10-slot well screens. An appropriately sized filter sand pack was installed around each well screen to approximately 1-foot above the screened interval. The screens were placed in wet sand layers encountered at deep and shallow depths to ensure groundwater sampling success once installed. A 2-foot thick bentonite seal, hydrated in-place, was placed on top of the filter sand pack to isolate the well screen from the remaining borehole. Bentonite chips were then used to seal the remaining annual space within three (3) feet of the ground surface. Each monitoring well was completed at the ground surface with a stickup steel locking protective cover set in concrete surrounded by three (3) safety bollards for protection from any farming equipment. An expandable J-plug was provided for each monitoring well.

7.2 Groundwater Sampling

Eight (8) groundwater samples were collected within Sites CA03, CA04, and CA05 from all of the permanent monitoring wells at the four (4) locations (**Figures 2a, 2b)**. The monitoring wells were allowed to equilibrate for a total of one (1) month after the installation and development. Before collecting the groundwater samples, static water levels were measured using an electronic water tape from the top of the well casing of each of the wells. Each monitoring well was purged, and groundwater samples were collected for PFAS analysis in laboratory supplied containers. Water quality parameters (temperature, specific conductance, pH, dissolved solids, oxidation-reduction potential, and turbidity) were recorded following AECOM groundwater Standard Operating Procedures using a YSI Pro DDS water quality meter. Water quality measurements recorded during purging are summarized in **Table 5** and **Appendix B**. The analytical data are summarized in the table below and attached in **Table 4** and **Figures 5a** and **5b**.

Ground Water Sample ID	Sample Date	Field Site	Total PFAS[1]	PFOA[1]	PFOS[1]
GW2001141525RAP	1/14/2020	CA03-MW1D	< 2.02	< 2.02	< 2.02
GW2001141450RAP	1/14/2020	CA03-MW1S	**219.8**	**9.86**	< 2.04
GW2001161145RAP	1/16/2020	CA04-MW1D	**6.30**	< 1.95	< 1.95
GW2001161030RAP	1/16/2020	CA04-MW1S	**10.69**	< 2.02	< 2.02
GW2001161400RAP	1/16/2020	CA05-MW1D	**2.59**	< 2.01	< 2.01
GW2001161305RAP	1/16/2020	CA05-MW1S	**2.84**	< 2.05	< 2.05
GW2001161615RAP	1/16/2020	CA05-MW2D	< 1.99	< 1.99	< 1.99
GW2001161500RAP	1/16/2020	CA05-MW2S	< 1.93	< 1.93	< 1.93
GW2001161500RAP-FD	1/16/2020	CA05-MW2S	< 2.01	< 2.01	< 2.01

[1]Units are in nanograms per liter (ng/L) or parts per trillion (ppt)

All samples taken from the eight (8) monitoring wells did not exceed Part 201 Residential and Nonresidential Drinking-Water Criteria (DWC) for PFOS, PFNA, PFHxS, PFHxA, and PFBS of 16, 6, 51, 400,000, and 420 ng/L, respectively. One (1) of the eight (8) groundwater samples, taken from CA03-MW1S, exceeded the Part 201 DWC for PFOA of 8 ng/L, with a detection of 9.86 ng/L (**Table 4**).

The highest Total PFAS concentration in groundwater was located on the southern edge of Site CA03, at the shallow monitoring well CA03-MW1S. It should be noted that well CA03-MW1S was screened from five (5) ft to 10 ft bgs, likely in a perched groundwater zone. This monitoring well is set adjacent to CA03-DU2, located in Adrian Muck, and had the highest TOC value. PFAS are known to adsorb more strongly to fine particles such as silt and clay, which contain

more TOC. CA03-MW1S was the only well to detect any level of PFOA, and all eight (8) monitoring wells did not detect levels of PFOS.

Groundwater flow is based on groundwater static water levels measured in the eight (8) monitoring wells (**Table 5**) and the location of nearby surface water bodies. The groundwater flow at Site CA03 is towards the nearby creek and southern pond (**Figure 6a**). At Site CA04, groundwater flows to the southwest, towards the adjacent creek (**Figure 6b**). At Site CA05, the groundwater flows towards the pond located southwest of the Site.

8. QA/QC Results

Laboratory reports 1900723 and 1900728 (Soil and Surface Water), 2000118 (Groundwater), and 1803576 (Bronson WWTP) from Vista Analytical Laboratories and report 460-179559-1 from Test America Laboratory were subjected to data quality review (**Appendix E**). The reports were evaluated for data completeness, holding times and sample preservation, method and field blanks, ongoing precision and recovery (OPR), field duplicate precision, extracted internal standard recoveries, and reporting issues.

The initial calibration and continuing calibration verifications met the method acceptance criteria. A method blank and ORP sample was extracted and analyzed with each preparation batch. No analytes were detected in the method blank above half (1/2) the Limit of Quantification (LOQ). The OPR recoveries were within the method acceptance criteria. No quality issues were identified for any of the samples, and all of the results were considered usable.

9. Investigation-Derived Waste (IDW)

Investigation-derived waste (IDW) generated during the investigation included the following:

- Disposable material such as Geoprobe® liners, personal protective equipment (PPE), plastic sheeting, etc.
- Drill cuttings
- Excess soil leftover from sampling activities
- Well development water
- Purge water
- Decontamination water

Minimally contaminated disposable sampling materials and PPE were containerized and disposed of as ordinary solid waste. Drill cuttings, excess soil from sampling, well development water, purge water, and decontamination water were discharged to the ground surface adjacent to where the material was generated.

10. Pathway and Receptors Evaluation

An exposure pathway includes five components: the source of contamination, environmental media and transport mechanism, the point of exposure, route of exposure, and receptor population. A pathway is considered potentially complete if all five components are present, and one or more hazardous substances are detected. The human health risk associated with a

potentially complete exposure pathway is acceptable if concentrations do not exceed the applicable criteria and background concentrations (Rule 299.1013(3)). Ecological risks are acceptable if concentrations do not exceed water quality values or soil screening values. Potentially complete groundwater exposure pathways associated with Sites CA03, CA04, and CA05 and corresponding Part 201 cleanup criteria are:

- Part 201 Residential and Nonresidential Drinking Water Criteria (DWC):
  - PFOA = 8 ng/L
  - PFOS = 16 ng/L
  - Perfluorononanoic acid (PFNA) = 6 ng/L
  - Perfluorohexane sulfonic acid (PFHxS) = 51 ng/L
  - Perfluorohexanoic acid (PFHxA) = 400,000 ng/L
  - Perfluorobutane sulfonic acid (PFBS) = 420 ng/L
  - Hexafluoropropylene oxide dimer acid (HFPO-DA) 370 ng/L
- Groundwater-Surface Water Interface (GSI) Criteria: PFOA = 12,000 ng/L and PFOS = 12 ng/L

Additionally, EGLE only regulates PFOA and PFOS in the surface water. Criteria under the Michigan Rule 57 WQS were developed to protect humans, wildlife, and aquatic life. Potentially complete surface water exposure pathways associated with all Sites and corresponding Rule 57 WQS are:

PFAS	Human Noncancer Value (nondrinking water source)	Human Noncancer Value (drinking water source)	Final Chronic Value	Final Acute Value	Aquatic Maximum Value
PFOS[1]	12	11	140,000	1,600,000	780,000
PFOA[1]	12,000	420	880,000	15,000,000	7,700,000

[1]Units are in nanograms per liter (ng/L) or parts per trillion (ppt). These units are considered equivalent.

Potentially complete soil exposure pathways associated with all Sites and corresponding Part 201 cleanup criteria (if available) are:

- Direct Contact Criteria (DCC; criteria not available).
- Human exposure by consuming impacted vegetation (gardening, farming; screening levels not available).

Potential receptors associated with groundwater are:

- People who use impacted groundwater for drinking water.

Potential receptors associated with surface water are:

- People using the drains and streams and other impacted surface waters for recreation and fishing.
- Fish and other aquatic life.

Potential receptors associated with soil are:

- Residents living at or near impacted soil areas.
- Non-residential use of impacted soil areas, such as farming and commercial use.

10.1 Surface Soil Evaluation

On-site farm workers may encounter surficial soils with detectable PFAS concentrations; however, no Part 201 direct contact criteria have been established for any PFAS compounds, including PFOS and PFOA. All soil samples collected from the eight (8) DUs had some PFAS compounds detected. PFOS was the main compound detected in all eight (8) samples with concentrations of 0.891 to 15.7 µg/Kg. All soil samples were non-detect for PFOA. The area with the highest Total PFAS soil concentrations was Site CA03, with the highest Total PFAS value of 16.7 µg/Kg. All four (4) soil samples collected resulted in relatively low Total PFAS concentrations (**Table 2**) compared to soil samples collected from other agricultural fields associated with industrially impacted biosolids from other municipal WWTPs with significant PFAS sources.

Studies have shown that PFAS does have the potential for plant uptake. Depending on the plant type and PFAS compound, the accumulation of PFAS is not evenly distributed throughout the major components of the plant. Some of the PFAS will accumulate more in the roots, while others accumulate in the leaves or fruits. However, exposure to PFAS via plant uptake through direct or indirect ingestion of PFAS-impacted plants may also be possible. Crops used for animal feed production (e.g., silage) may potentially allow the PFAS to bioaccumulate in the livestock. Currently, there are no PFAS criteria for plants; however, a consumption advisory could be developed in the future like those for fish.

10.2 Surface Water Evaluation

PFAS concentrations were detected in all nine (9) surface water samples and both samples collected from the tile drains. However, none of the locations detected values of PFOA, and only three (3) surface water locations and both tile drains detected PFOS values (**Table 3**). Rule 57 WQS were not exceeded in any surface water samples for PFOS (12 ng/L) or PFOA (12,000 ng/L).

10.3 Groundwater Evaluation

Approximately 20 private/household wells (residential wells) were identified close to Sites CA03, CA04, and CA05 (**Figure 7**) using the EGLE Wellogic database. The EGLE Wellogic database does not include all of the well records; however, a review of additional, historic scanned well logs were also performed. The majority of the residential wells were either upgradient or side gradient to all of the Sites. Only one (1) residential well was located close to monitoring wells CA05-MW2S and CA05-MW2D. However, all PFAS analyzed were not detectable in both monitoring wells. Based on the results of this investigation, there is no unacceptable risk based on Part 201 DWC. Groundwater may also be used for agricultural irrigation, however; no irrigation wells are located on Site CA03 or CA04. At Site CA05, a 115 ft deep irrigation well is located near CA05-MW2, which reported non-detectable values. This irrigation well therefore does not suggest risk of Part 201 DWC exceedances. Note, groundwater samples collected as part of EGLE ’s Statewide Public Water Supply Sampling Program near the biosolids application sites were also non-detect for PFAS.

11. Summary and Discussion

AECOM conducted a field investigation to determine the impact, if any, from the land application of biosolids suspected of containing very high levels of PFAS concentrations from the Bronson WWTP. This investigation expands EGLE's knowledge of PFAS at land application sites that may be associated with industrially impacted biosolids. Further, the investigation allows for comparison of PFAS in the soil, groundwater, and adjacent surface water bodies at Sites CA03, CA04, and CA05 to other agricultural fields associated with land application of biosolids not considered to be industrially impacted from non-IPP and IPP WWTPs. Land application field investigations will also help guide understanding of fate and transport of PFAS in environmental matrices and supplement fate and transport modeling analysis being conducted on this topic.

The soil, surface water, and groundwater sampling results indicate low PFAS concentrations in all three matrices due to the land applications of biosolids and are summarized in **Table 2**, **Table 3**, and **Table 4**. PFAS was detected in all eight (8) surface soil samples (**Table 2** and **Figures 3a, 3b**), all nine (9) surface water and both tile drain locations (**Table 3** and **Figures 4a, 4b)**, and five (5) of the eight (8) groundwater samples (**Table 4** and **Figures 5a, 5b**). The laboratory reports are included in **Appendix E**.

PFAS such as PFBA, PFPeA, PFHxA, PFHpA, PFBS, and PFPeS have a shorter carbon chain length and are referred to as short-chain PFAS. While PFAS such as PFHxS, PFOA, and PFOS have longer fluorinated carbon chain lengths referred to as long-chain PFAS. The carbon chain length for PFBA and PFBS is four (4), and eight (8) for PFOA and PFOS. The shorter the carbon chain length for PFAS, the more mobile they are in the environment. As a result, long-chain PFAS are expected to concentrate and be present in the biosolids and soils at higher concentrations, while short-chain PFAS to be more frequently detected in the aqueous phases such as surface water, tile drains, and groundwater. The detection limits for the solid phase (i.e., biosolids and soil) are in the low micrograms per kilogram (µg/Kg) or parts per billion (ppb) range. For the aqueous phase (i.e., surface water, tile drains, and groundwater), the detection limits are in the low nanograms per liter (ng/L) or parts per trillion (ppt). As a result, PFAS that are non-detect in the solid phase may still be present at very low concentrations below the detection limit and may be detected in the aqueous phases.

PFAS properties, including fate and transport in the environment, are still being studied and are currently not fully understood. Equations developed to estimate leachability and migration of PFAS have not been empirically verified at this time. EGLE is currently evaluating additional agricultural fields and performing subsurface modeling to better understand the fate and transport of PFOA and PFOS in the environment.

11.1 Soil

Based on EGLE's assessment of WWTPs, long-chain PFAS (e.g., PFOS and PFOA) accumulate at higher concentrations in sludge and biosolids; as a result, less short-chain PFAS are expected to be present in the land-applied biosolids when compared to long-chain PFAS. The soil results indicated that PFOS was the PFAS compound detected at the highest concentrations, varying from 0.89 to 15.7 µg/Kg. However, the soil results showed that the PFOS concentrations in soils at Sites CA03, CA04, and CA05 were significantly lower than those detected at other agricultural fields (i.e., ~77 to 172 µg/Kg), where industrially impacted biosolids were also applied. The PFOS concentrations in soils at Sites CA03, CA04, and CA05 were more similar to concentrations identified in some agricultural fields associated with land application of non-industrially impacted biosolids originated from non-IPP WWTPs. This indicates that the geological conditions at the Site could play a significant role.

Further, PFAS, especially the long-chain PFAS compounds, are known to adsorb more strongly to fine particles such as silt and clay, which contain more TOC. The TOC analysis indicates that the maximum TOC values are associated with CA03-DU02 and Adrian muck, located in the southwest area of Site CA03. This sample was the highest second result for total PFAS. However, there was no clear relationship between TOC and PFAS likely due to the variation in PFAS concentration in the biosolids over time and the amount of land-applied biosolids. This indicates that site-specific environmental conditions could play a very significant role in environmental impacts.

A discussion about the PFAS concentrations in surface water, tile drains, and groundwater in relation to the soil samples is provided in **Section 11.2** and **11.3** below.

11.2 Surface Water

PFAS concentrations detected in surface water are likely related to surface runoff and potential discharge of shallow groundwater into the surface water body. A total of seven (7) surface water samples were collected from Site CA03 (**Figure 4a**). Surface water samples CA03-SW1 and CA03-SW6 are considered to be upgradient background concentrations, with approximately 1.4 ng/L of PFBA detected in both samples. Surface water samples CA03-SW4, CA03-SW5, and CA03-SW7 were collected from locations side gradient of Site CA03 with possible little surface water runoff discharge from Site CA03 because of the vegetation that was present, including trees on the field next to the surface water. These three samples had PFBA detections of approximately 3.0 ng/L, and the signature looks similar to the upgradient surface water samples CA03-SW1 and CA03-SW6. This indicates a limited impact on the surface water in the southeast area of Site CA03 as the surface water sample situated downgradient of Site CA03 was CA03-SW2, and it had the highest Total PFAS concentration of 10 ng/L with no PFOA or PFOS detected. The second-highest Total PFAS concentration of 8.03 ng/L was for surface water sample CA03-SW3, collected from an area where a small pond of perched water is located on the south side of Site CA03. There was also a small PFOS detection in sample CA03-SW3 of 3.06 ng/L. All seven (7) samples collected from Site CA03 were below Rule 57 WQS for both PFOA and PFOS, with most of the samples being non-detect and only one detection for PFOS at CA03-SW3.

Sites CA04 and CA05 are located close to each other, with Site CA05 located north of Site CA04. Site CA05 had more biosolids land-applied than Site CA04 and is located upgradient of Site CA04. The impact of both sites will be evaluated together. One (1) surface water sample and one (1) tile drain sample was collected from Site CA04 and Site CA05 (**Figure 4b**). The Total PFAS concentrations in the surface water samples and tile drains were between 6.65 and 14.12 ng/L. The groundwater and surface water flow in the area is generally to the southwest (**Figure 6b**). Sample CA05-SW1, which was the most upgradient sample location, had a lower Total PFAS concentration of 6.65 ng/L. The concentrations for Total PFAS increased downgradient from the Sites CA04 and CA05, including the tile drains. The highest Total PFAS concentration was 14.12 ng/L in sample CA04-SW1 and was collected the furthest downgradient of the Site. The two (2) surface water samples and two (2) tile drain samples collected from Sites CA04 and CA05 were below the Rule 57 WQS, for both PFOA and PFOS, with all of the samples being non-detect for PFOA and with a Total PFOS concentration between 1.41 to 4.55 ng/L.

The environmental impact on the surface waters from land-application of biosolids at all three Sites, CA03, CA04, and CA05, was low, with PFOA and PFOS concentrations either being non-detect or low detections that are below WQS.

11.3 Groundwater

A total of eight (8) wells were installed as shallow and deep pairs at four locations with two (2) wells CA03-MW1 (S, D) at Site CA03, two (2) wells CA04-MW1 (S, D) at Site CA04, and four (4) wells CA05-MW1 (S, D) and CA05-MW2 (S, D) at Site CA05. A total of eight (8) groundwater samples were collected within Sites CA03, CA04, and CA05 from all permanent monitoring wells (**Figures 2a, 2b)**.

The highest total PFAS concentration of 219.8 ng/L at Site CA03 was identified in well CA03-MW1S. The well was screened between 5 to 10 ft bgs, and the groundwater was very shallow at about 4.8 ft bgs. The majority of PFAS detected were short-chain PFAS known to adsorb less to soils and partition to the aqueous phase. PFOS was non-detect in both wells, CA03-MW1S and CA03-MW1D. As stated earlier, while short-chain PFAS were not detected in any of the soil samples, they may still be present at a lower concentration below the detection limit of low µg/Kg or ppb in soils but identified in water samples due to the lower detection limits for the aqueous phase in the range of ng/L or ppt. Perfluoroalkyl Carboxylic Acids (PFCAs), also known as PFOA-family compounds, are known to adsorb less to the soil than Perfluoroalkane Sulfonic Acids (PFSAs), also known as PFOS-family compounds. As a result, PFCAs are expected to be detected more frequently and at higher concentrations in the aqueous phase if similar concentrations are present in the soil. PFOA was also detected in the shallow screened well, CA03-MW1S, at a concentration of 9.81 ng/L, which was above the Part 201 DWC criterion of 8 ng/L. However, the deeper well, CA03-MW1S, at the same location and screened from 21 to 26 ft bgs, did not indicate any PFAS impact, with all of the PFAS compounds being non-detect. The concentrations of PFHxS, PFOS, and PFNA were non-detect in monitoring wells CA03-MW1S and CA03-MW1D, with the concentrations for PFHxA and PFBS not exceeding the Part 201 Residential and Nonresidential DWC of 400,000 and 420 ng/L, respectively.

Sites CA04 and CA05 are situated next to each other, with Site CA05 located north and upgradient of Site CA04. The groundwater evaluation was done for both sites together. The highest Total PFAS concentration of 10.69 ng/L at Site CA04 was identified in the shallow screened well, CA04-MW1S. Well CA04-MW1S is located immediately downgradient of the soil samples with the highest PFAS concentrations. The well was screened between 5 to 10 ft bgs, and the groundwater was very shallow at about 4.8 ft bgs. All of the PFAS detected were short-chain PFAS known to adsorb less to soils and partition to the aqueous phase. The PFOA, PFOS, PFNA, PFHxS, PFHxA, and PFBS concentrations were non-detect in all six (6) wells from Sites CA04 and CA05, including shallow and deep wells. Like the results from Site CA03, short-chain PFAS were detected in the groundwater, even though they were non-detect in the soils, for the reasons described at Site CA03. Monitoring wells CA05-MW1S and CA05-MW1D were meant to be located upgradient and identify any potential background impact in the area. The only detection in both the shallow and deep wells was PFBA, which appears to be a background PFAS observed in upgradient surface water samples at Site CA03. The groundwater elevation in both the shallow and deep wells indicated a vertically downward flow of groundwater, and PFAS impacts may be expected to be detected in the deep wells. PFBA was also detected in the deeper upgradient monitoring well CA05-MW1D at lower concentrations than those identified in the shallow upgradient well CA05-MW1S.

There were no PFAS detected in both the shallow (CA05-MW2S) and deep (CA05-MW2D) monitoring wells located downgradient on Site CA05. This indicates that the environmental impact of Site CA05 alone is not significant. PFAS were detected in the deep monitoring well CA04-MW1D downgradient of Site CA05, which had lower concentrations than those detected in the shallow monitoring well CA04-MW1S. The low detections of short-chain PFAS in the shallow (CA04-MW1S) and deep well (CA04-MW1D) indicate that the Site's impact is not significant and below any current criteria.

The groundwater at Sites CA03, CA04, and CA05 showed a low impact of short-chain PFAS, with the only exceedance of the Part 201 PFOA criteria of 8 ng/L in the shallow monitoring well CA03-MW1S, which was screened at five (5) to 10 ft bgs. Based on the regional groundwater flow, location of residential wells in the area, and minimal PFAS concentrations identified in the deep wells, there does not appear to be a potential risk to the drinking water wells.

Figures

07s08w10-CA03

07s08w11-CA05

Bronson WWTP

07s08w11-CA04

AECOM

Drawn:	JS	Date: 5/12/2020
Approved:	DB	Date: 5/12/2020
Project #:		

Legend

- Waste Water Treatment Plant
- Biosolids Application Field

N

0 1 2 Miles

FIGURE 1
BRONSON BIOSOLIDS APPLICATION FIELDS OVERVIEW

BRONSON, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Biosolids_MDEQ\MXD\Bronson\F1_Bronson_Fields_Overview.mxd

07s08w10-CA03

CA03-SW1 02

CA03-SW1 01

6

33B

8

25B

CA03-DU3

6

20

CA03-SW4

CA03-DU1

CA03-SW5 01

CA03-SW5 02

20

CA03-SW3

CA03-DU2

CA03-MW1D

CA03-MW1S

CA03-DU4

5B

CA03-SW2

AECOM

Drawn: JS	Date: 5/12/2020
Approved: DB	Date: 5/12/2020
Project #:	

Legend

- Biosolids Application Field
- 50' x 50' Sampling Grid
- Soil Type
- Monitoring Well
- Surface Water Sample
- Approximate GW Flow Direction
- SW Flow Direction

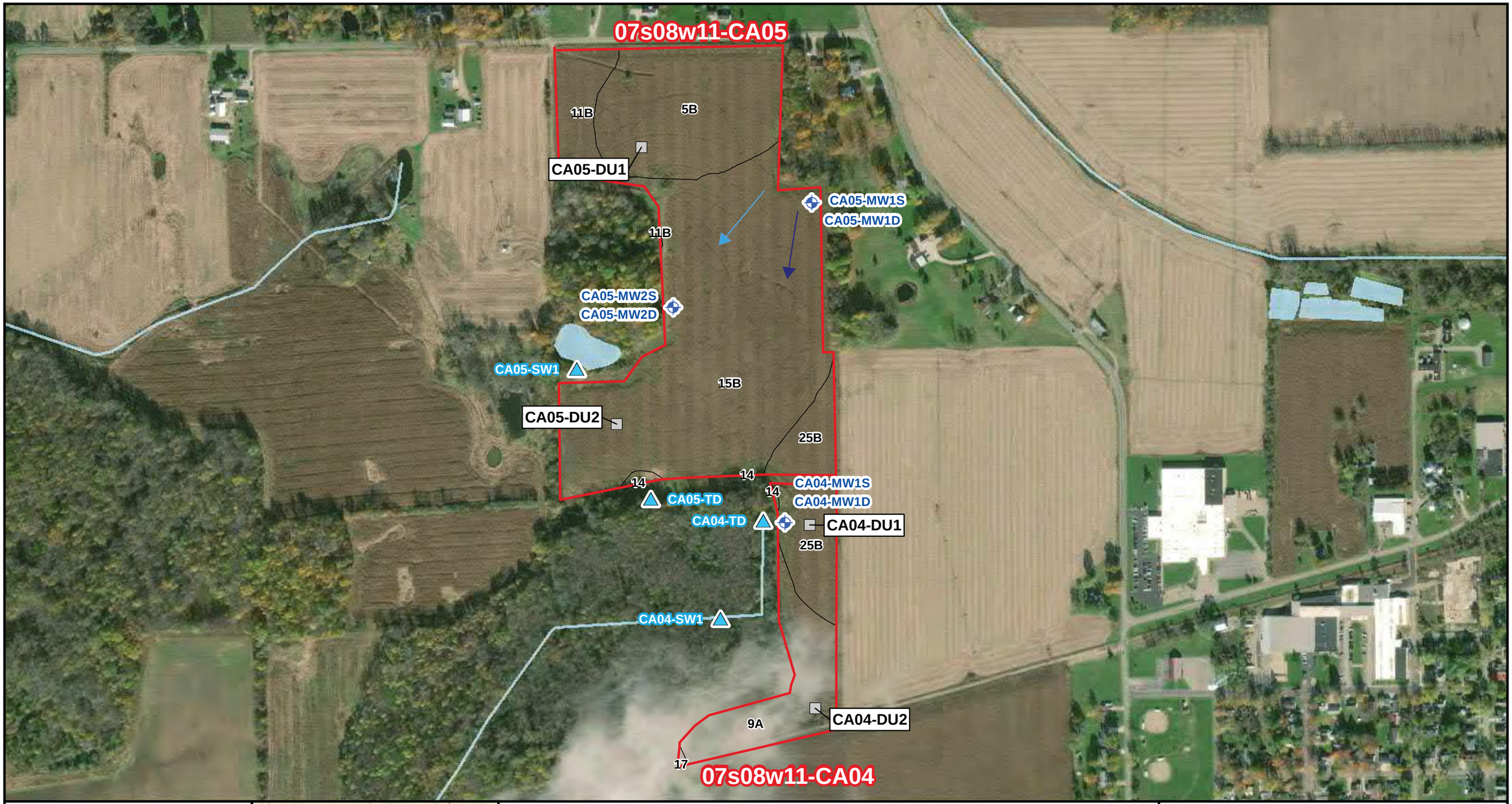
N

0 125 250 375 500 625 1,250 Feet

FIGURE 2a
07S08W10-CA03
SAMPLE LOCATIONS

BRONSON, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Biosolids_MDEQ\MXD\Bronson\F2a_Bronson_CA03_Sample_Locations.mxd



AECOM

Drawn: JS	Date: 5/12/2020
Approved: DB	Date: 5/12/2020
Project #:	

Legend

- Biosolids Application Field
- 50' x 50' Sampling Grid
- Soil Type
- Monitoring Well
- Surface Water Sample
- Approximate GW Flow Direction
- SW Flow Direction

N

0 250 500 750 1,000 1,250 2,500 Feet

FIGURE 2b
07S08W11-CA04 & CA05 SAMPLE LOCATIONS

BRONSON, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Biosolids_MDEQ\MXD\Bronson\F2b_Bronson_CA04_CA05_Sample_Locations.mxd

07s08w10-CA03

6

33B

25B

8

CA03-DU3
10.4 (0 | 10.4)

6

20

CA03-DU1
16.7 (0 | 15.7)

20

CA03-DU2
7.69 (0 | 7.69)

CA03-DU4
0.891 (0 | 0.891)

5B

AECOM

Drawn: JS	Date: 5/14/2020
Approved: DB	Date: 5/14/2020
Project #:	

Legend

50' x 50' Soil Sampling Grid PFOS (ppb)
- Non-Detect
- >0 - 10
- >10 - 50
- >50 - 100
- >100 - 500
- >500

- Biosolids Application Field
- Soil Type

Sample Location
Total PFAS (PFOA | PFOS)
*results reported in units of ppb

N

0 88 176 264 352 440 880 Feet

FIGURE 3a
07S08W10-CA03
SOIL SAMPLING RESULTS

BRONSON, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Biosolids_MDEQ\MXD\Bronson\F3a_Bronson_CA03_Soil_Results_Chembox.mxd

07s08w11-CA05

11B

5B

CA05-DU1
7.00 (0 | 7)

11B

CA05-DU2
6.28 (0 | 6.28)

15B

25B

14

14

14

CA04-DU1
13.3 (0 | 13.3)

25B

9A

CA04-DU2
3.92 (0 | 3.92)

17

07s08w11-CA04

AECOM

Drawn: JS	Date: 5/14/2020
Approved: DB	Date: 5/14/2020
Project #:	

Legend

50' x 50' Soil Sampling Grid
PFOS (ppb)
- Non-Detect
- >0 - 10
- >10 - 50
- >50 - 100
- >100 - 500
- >500

- Biosolids Application Field
- Soil Type

Sample Location
Total PFAS (PFOA | PFOS)
*results reported in units of ppb

N

0 178 356 534 712 890 1,780 Feet

FIGURE 3b
07S08W11-CA04 & CA05
SOIL SAMPLING RESULTS

BRONSON, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Biosolids_MDEQ\MXD\Bronson\F3b_Bronson_CA04_CA05_Soil_Results_Chembox.mxd

07s08w10-CA03

CA03-SW6
1.47 (0 | 0)

CA03-SW1
1.42 (0 | 0)

CA03-SW4
2.85 (0 | 0)

CA03-SW7
3.3 (0 | 0)

CA03-SW5
2.57 (0 | 0)

CA03-SW3
8.03 (0 | 3.06)

CA03-SW2
10.02 (0 | 0)

6
33B
25B
8
6
20
20
5B

AECOM

Drawn: JS	Date: 5/14/2020
Approved: DB	Date: 5/14/2020
Project #:	

Legend

Surface Water Sample
PFOS (ppt)
- Non-Detect
- >0 - 12
- >12

Biosolids Application Field
Soil Type

Sample Location
Total PFAS (PFOA | PFOS)
*results reported in units of ppt

N

0 88 176 264 352 440 880 Feet

FIGURE 4a
07S08W10-CA03
SURFACE WATER SAMPLING RESULTS

BRONSON, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Biosolids_MDEQ\MXD\Bronson\F4a_Bronson_CA03_SW_Results_Chembox.mxd

07s08w11-CA05

11B

5B

11B

CA05-SW1
6.65 (0 | 1.43)

15B

25B

14

14

14

CA05-TD
9.21 (0 | 1.41)

CA04-TD
13.1 (0 | 4.55)

25B

CA04-SW1
14.12 (0 | 3.75)

9A

17

07s08w11-CA04

AECOM

Drawn: JS	Date: 5/14/2020
Approved: DB	Date: 5/14/2020
Project #:	

Legend

Surface Water Sample
PFOS (ppt)

- Non-Detect
- >0 - 12
- >12

Biosolids Application Field

Soil Type

Sample Location
Total PFAS (PFOA | PFOS)

*results reported in units of ppt

N

0 178 356 534 712 890 1,780
Feet

FIGURE 4b
07S08W11-CA04 & CA05
SURFACE WATER SAMPLING RESULTS

BRONSON, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Biosolids_MDEQ\MXD\Bronson\F4b_Bronson_CA04_05_SW_Results_Chembox.mxd

07s08w10-CA03

6

33B

25B

8

6

20

20

CA03-MW1S
219.76 (45.5 | 9.86 | 0 | 54.6 | 0 | 0)

CA03-MW1D
0 (0 | 0 | 0 | 0 | 0 | 0)

5B

AECOM

Drawn: DP	Date: 12/29/2020
Approved: DB	Date: 12/29/2020
Project #: 60588767	

Legend

Monitoring Well Sample

Biosolids Application

Soil Type

Sample Location
Total PFAS (PFHxA | PFOA | PFNA | PFBS | PFHxS | PFOS)

red text indicates exceedance of Part 201 DWC

All sample results are in ng/L

Michigan Part 201 Residential & Nonresidential Drinking Water Criteria (DWC), ng/L
PFHxA = 400,000
PFOA = 8
PFNA = 6
PFBS = 420
PFHxS = 51
PFOS = 16

N

0 100 200 300 400 500 1,000 Feet

FIGURE 5a
07S08W10-CA03
GROUNDWATER SAMPLING RESULTS

BRONSON, MI

Document Path: L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Biosolids_MDEQ\MXD\Bronson\F5a_Bronson_CA03_GW_PFOS_Part201_Results_Chembox.mxd

07s08w11-CA05

11B

5B

CA05-MW1S
2.84 (0 | 0 | 0 | 0 | 0 | 0)

CA05-MW1D
2.59 (0 | 0 | 0 | 0 | 0 | 0)

11B

CA05-MW2S
0 (0 | 0 | 0 | 0 | 0 | 0)

CA05-MW2D
0 (0 | 0 | 0 | 0 | 0 | 0)

15B

25B

14

14

14

CA04-MW1S
10.69 (0 | 0 | 0 | 4.22 | 0 | 0)

CA04-MW1D
6.3 (0 | 0 | 0 | 3.97 | 0 | 0)

25B

9A

17

07s08w11-CA04

AECOM

Drawn: DP	Date: 12/29/2020
Approved: DB	Date: 12/29/2020
Project #: 60588767	

Legend

Monitoring Well Sample

Biosolids Application

Soil Type

Sample Location
Total PFAS (PFHxA | PFOA | PFNA | PFBS | PFHxS | PFOS)

red text indicates exceedance of Part 201 DWC

All sample results are in ng/L

Michigan Part 201 Residential & Nonresidential Drinking Water Criteria (DWC), ng/L
PFHxA = 400,000
PFOA = 8
PFNA = 6
PFBS = 420
PFHxS = 51
PFOS = 16

N

0 200 400 600 800 1,000 2,000 Feet

FIGURE 5b
07S08W11-CA04 & CA05
GROUNDWATER SAMPLING RESULTS

BRONSON, MI

Document Path: L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Biosolids_MDEQ\MXD\Bronson\F5b_Bronson_CA04_CA05_GW_PFOS_Part201_Results_Chembox.mxd

AECOM

Drawn: JS	Date: 5/12/2020
Approved: DB	Date: 5/12/2020
Project #:	

Legend

- Monitoring Well Sample
- Biosolids Application Field
- Soil Type
- Estimated Shallow GW Flow Direction
- Estimated Deep GW Flow Direction
- * = Perched Elevation

Note: All Groundwater Elevations are Estimated Using Measured Depth to Water From DEM Ground Elevation

N

0 84 168 252 336 420 840 Feet

FIGURE 6a
07S08W10-CA03
LOCAL GROUNDWATER CONTOURS

BRONSON, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Biosolids_MDEQ\MXD\Bronson\F6a_Bronson_CA03_Local_GW_Contours.mxd

07s08w11-CA05

11B

5B

CA05-MW1S - 920.00'

CA05-MW1D - 918.53'

11B

CA05-MW2S - 918.63'

CA05-MW2D - 918.49'

15B

25B

14

14

14

CA04-MW1S - 902.55'

CA04-MW1D - 902.31'

25B

9A

17

07s08w11-CA04

AECOM

Drawn: JS	Date: 5/12/2020
Approved: DB	Date: 5/12/2020
Project #:	

Legend

- Monitoring Well Sample
- Biosolids Application Field
- Soil Type
- Estimated Shallow GW Flow Direction
- Estimated Deep GW Flow Direction

* = Perched Elevation

Note: All Groundwater Elevations are Estimated Using Measured Depth to Water From DEM Ground Elevation

N

0 200 400 600 800 1,000 2,000 Feet

FIGURE 6b
07S08W11-CA04 & CA05
LOCAL GROUNDWATER CONTOURS

BRONSON, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Biosolids_MDEQ\MXD\Bronson\F6b_Bronson_CA04_CA05_Local_GW_Contours.mxd

07S08W10-CA03

07S08W11-CA05

07S08W11-CA04

AECOM

Drawn: AA	Date: 12/14/2022
Approved: DB	Date: 12/14/2022
Project #: 60588767	

Legend

- Wellogic Water Wells
- Wellogic Type I Wells
- Wellogic Type II Wells
- Biosolids Application
- GW Elevation Contours (10' interval)
- Approximate GW Flow Direction

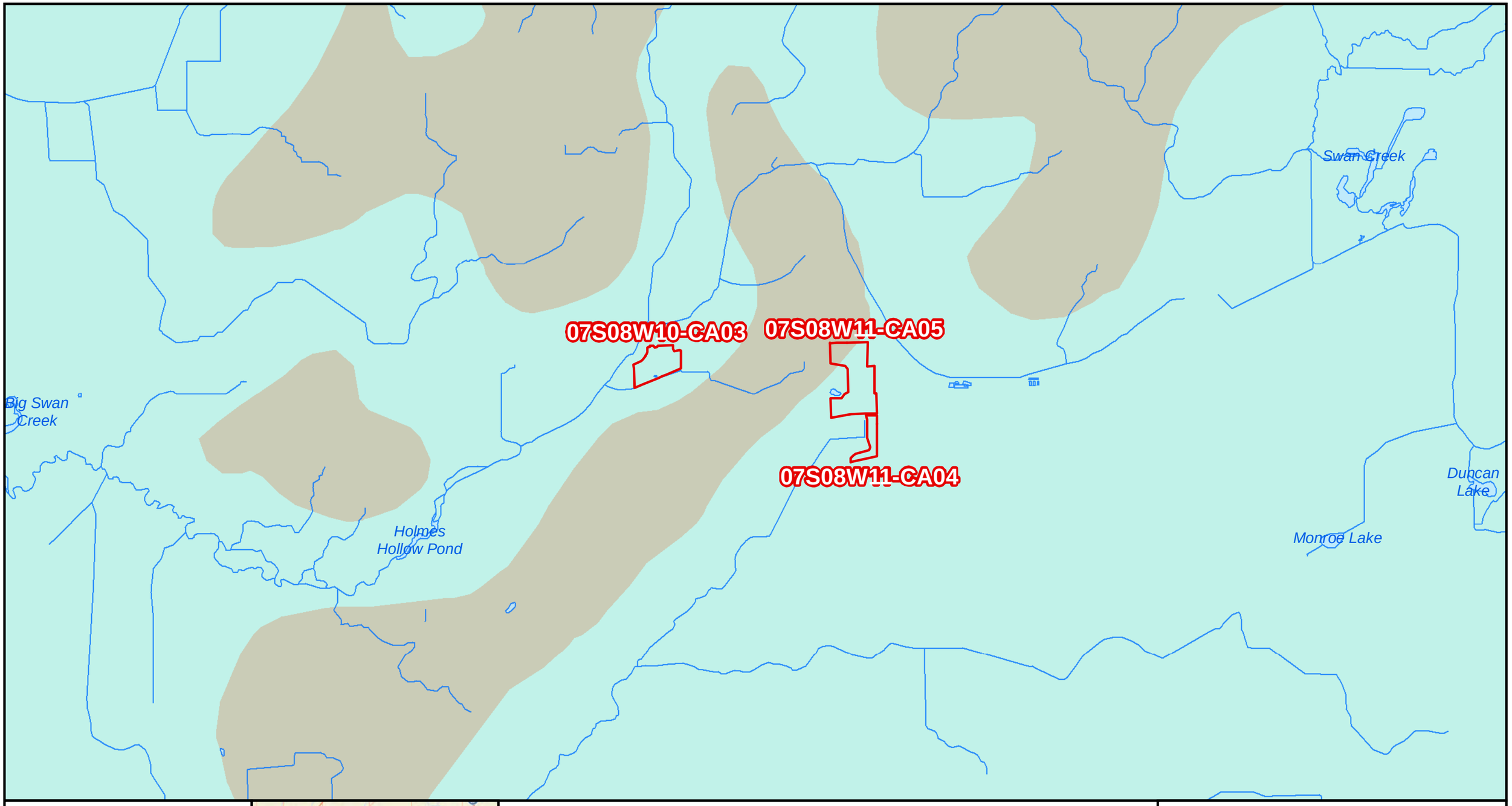
N

0 680 1,360 2,040 2,720 3,400 6,800 Feet

FIGURE 7
07S08W10-CA03, 07S08W11-CA04 & CA05
POTENTIAL RECEPTORS

BRONSON, MI

Document Path: Z:\GrandRapids-USGRR01\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Biosolids_MDEQ\MXD\Bronson\2022\F7_Bronson_CA03_CA04_CA05_Potential_Receptors.mxd



AECOM

Drawn: AA	Date: 12/14/2022
Approved: DB	Date: 12/14/2022
Project #: 60588767	

Legend

Glacial Geology

- Coarse-textured glacial till
- Dune sand
- End moraines of coarse-textured till
- End moraines of fine-textured till
- End moraines of medium-textured till
- Fine-textured glacial till
- Glacial outwash sand and gravel and postglacial alluvium
- Lacustrine clay and silt
- Lacustrine sand and gravel
- Medium-textured glacial till
- Water
- Biosolids Application Field

0 0.5 1 2 Miles

N

FIGURE 8
07S08W10-CA03, 07S08W11-CA04 & CA05
REGIONAL GLACIAL GEOLOGY

BRONSON, MI

Document Path: Z:\GrandRapids-USGRR01\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Biosolids_MDEQ\MXD\Bronson\2022\F8_Bronson_CA03_CA04_CA05_Regional_Glacial_Geology.mxd

Tables

Table 1

Parcel ID: 07S08W10-CA03, 07S08W11-CA04 and CA05
Biosolids Application Data

Year	Site ID	Dry Ton (dT) Land Applied	Acres Used	Acres Approved	Dry Tons (dT) / Acre	Dates
2014	07s08w10-CA03	46.31	16	22	2.25	11/14, 11/15, and April 23-29
2012	07s08w10-CA03	48.21	20	22	2.44	11/25, 10/26, 10/27, 10,28, and 6/2, 6/4
2010	07s08w10-CA03	32.60	20	22	1.63	10/15, 10/16, 10/17, and 4/1, 4/2, 4/3
2007	07s08w10-CA03	24.64	20	22	1.23	4/27, 4/28, 4/29, 4/30
2005	07s08w10-CA03	27.98	20	22	1.40	12/15, 12/16
2003	07s08w10-CA03	24.15	16	22	1.51	10/29, 10/30
Total dry tons:		**203.89**	**Average application rate (dry tons/acre):**		1.74	
2017	07s08w11-CA04	28.89	9	9	3.21	11/2, 11/3, 11/7 - 11/11, & 11/14/16
2001	07s08w11-CA04	10.27	5	9	2.054	10/31, 11/01
Total dry tons:		**39.16**	**Average application rate (dry tons/acre):**		2.63	
2017	07s08w11-CA05	45.9	45	45	1.02	4/21, 4/22, 4/26 - 4/28, & 5/11 - 5/13/17
2016	07s08w11-CA05	52.69				
2015	07s08w11-CA05	15.4	20	54	0.77	
2015	07s08w11-CA05	41.5	50	54	0.83	
2013	07s08w11-CA05	27	25	45	1.08	11/8, 11/9, 11/20, and 11/21/12
2013	07s08w11-CA05	76.05	45	45	1.69	May 24-27 & June 4-7 & 6/11/13
2012	07s08w11-CA05	26.48	20	45	1.32	6/5, 6/6, 6/7
2011	07s08w11-CA05	62.46		45		10/14, 15, 20, 21, 25/2010 & 4/14-15 and 6/1 - 3/2011
2009	07s08w11-CA05	16	20	54	0.80	10/23, 10/24, 10/30, and 10/31/08
2009	07s08w11-CA05	30.1	35	54	0.86	3/26, 3/27, 3/31, 4/2, 4/23, and 4/24/09
2007	07s08w11-CA05	26.93	37	45	0.73	10/24, 10/25, 10/26, 11/2, 11/3, 11/9
2005	07s08w11-CA05	20.13	30	45	0.67	4/28, 4/29
Total dry tons:		**441**	**Average application rate (dry tons/acre):**		0.98	

dT = dry tons

Table 2

Parcel ID: 07S08W10-CA03, 07S08W11-CA04 and CA05

Soil PFAS Analytical Results Summary

Soil Sample	Sample Date	Site Code	Total PFAS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFNS	PFDS	FOSA	4:2 FTSA	6:2 FTSA	8:2 FTSA	EtFOSAA	MeFOSAA	TOC
SXDU11904081125RL	4/8/2019	CA03	**16.7**	< 0.961	< 0.961	< 0.961	< 0.961	< 0.961	< 0.961	< 0.961	< 0.961	< 0.961	< 0.961	< 0.961	< 0.961	< 0.961	< 0.961	< 0.961	**15.7**	< 1.44	**1.01**	< 0.961	< 0.961	< 0.961	< 0.961	< 0.961	< 0.961	**13,000**
SXDU21904081210RL	4/8/2019	CA03	**7.69**	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	**7.69**	< 1.49	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	< 0.993	**29,000**
SXDU31904081300RL	4/8/2019	CA03	**10.4**	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	**10.4**	< 1.49	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	< 0.996	**19,000**
SXDU41904081450RL	4/8/2019	CA03	**0.891**	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	**0.891**	< 1.47	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	< 0.978	**13,000**
SXDU11904081825RL	4/8/2019	CA04-DU1	**13.3**	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	**13.3**	< 1.47	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	< 0.979	**13,000**
SXDU21904081910RL	4/8/2019	CA04-DU2	**3.92**	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	**3.92**	< 1.49	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	< 0.994	**8,100**
SXDU11904081700RL	4/8/2019	CA05-DU1	**7.00**	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	**7.00**	< 1.46	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	< 0.976	**6,500**
SXDU21904081755RL	4/8/2019	CA05-DU2	**6.28**	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	**6.28**	< 1.48	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	< 0.984	**6,800**

TOC = Total Organic Carbon
Soil concentrations are reported as ug/Kg or parts per billion (ppb)
TOC concentrations are reported as mg/Kg or parts per million (ppm)
Bolded values indicate detection

Perfluoroalkyl Carboxylic Acids (**PFCAs**)
Perfluoroalkane Sulfonic Acids (**PFSAs**)
Perfluoroalkane Sulfonamides (**FASAs**)
Fluorotelomer Sulfonic Acids (**FTSAs**)
N-Ethyl Perfluoroalkane Sulfonamidoacetic Acids (**EtFASAAs**)
N-Methyl Perfluoroalkane Sulfonamidoacetic Acids (**MeFASAAs**)

PFBA = Perfluorobutanoic acid
PFPeA = Perfluoropentanoic acid
PFHxA = Perfluorohexanoic acid
PFHpA = Perfluoroheptanoic acid
PFOA = Perfluorooctanoic acid
PFNA = Perfluorononanoic acid

PFDA = Perfluorodecanoic acid
PFUnDA = Perfluoroundecanoic acid
PFDoDA = Perfluorododecanoic acid
PFTrDA = Perfluorotridecanoic acid
PFTeDA = Perfluorotetradecanoic acid
PFHxDA = Perfluorohexadecanoic acid

PFODA = Perfluoro-n-octadecanoic acid
PFBS = Perfluorobutane sulfonic acid
PFHxS = Perfluorohexane sulfonic acid
PFHpS = Perfluoroheptane sulfonic acid
PFOS = Perfluorooctane sulfonic acid
PFDS = Perfluorodecane sulfonic acid

FOSA = Perfluorooctane sulfonamide
4:2 FTSA = 4:2 Fluorotelomer sulfonic acid
6:2 FTSA = 4:2 Fluorotelomer sulfonic acid
8:2 FTSA = 4:2 Fluorotelomer sulfonic acid
EtFOSAA = N-Ethyl perfluorooctane sulfonamidoacetic acid
MeFOSAA = N-Methyl perfluorooctane sulfonamidoacetic acid

Table 3

Parcel ID: 07S08W10-CA03, 07S08W11-CA04 and CA05

Surface Water and Tile Drain PFAS Analytical Results Summary

Surface Water Sample	Sample Date	Site Code	Total PFAS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFNS	PFDS	FOSA	4:2 FTSA	6:2 FTSA	8:2 FTSA	EtFOSAA	MeFOSAA
TD011904081845MK	4/8/2019	CA04	**13.10**	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	**8.55**	< 2.07	< 2.07	< 2.07	**4.55**	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07
TD011904081735MK	4/8/2019	CA05	**9.21**	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	**7.80**	< 1.98	< 1.98	< 1.98	**1.41**	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98
SW011904081320MK	4/8/2019	CA03	**1.42**	**1.42**	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06
SW021904081525RL	4/8/2019	CA03	**10.02**	**3.73**	**1.66**	**1.56**	< 2.25	< 2.25	< 2.25	< 2.25	< 2.25	< 2.25	< 2.25	< 2.25	**3.07**	< 2.25	< 2.25	< 2.25	< 2.25	< 2.25	< 2.25	< 2.25	< 2.25	< 2.25	< 2.25	< 2.25	< 2.25
SW031904081510RL	4/8/2019	CA03	**8.03**	**3.38**	< 2.09	< 2.09	**1.59**	< 2.09	< 2.09	< 2.09	< 2.09	< 2.09	< 2.09	< 2.09	< 2.09	< 2.09	< 2.09	< 2.09	**3.06**	< 2.09	< 2.09	< 2.09	< 2.09	< 2.09	< 2.09	< 2.09	< 2.09
SW041904081430MK	4/8/2019	CA03	**2.85**	**2.85**	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11	< 2.11
SW051904081440MK	4/8/2019	CA03	**2.57**	**2.57**	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06	< 2.06
SW061904081335MK	4/8/2019	CA03	**1.47**	**1.47**	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98	< 1.98
SW071904081450MK	4/8/2019	CA03	**3.30**	**3.30**	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12	< 2.12
SW011904081930MK	4/8/2019	CA04	**14.12**	**5.21**	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	**5.16**	< 2.07	< 2.07	< 2.07	**3.75**	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07	< 2.07
SW011904081700MK	4/8/2019	CA05	**6.65**	**5.22**	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	**1.43**	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02

All values are in nanograms per liter (**ng/L**) or parts per trillion (**ppt**)
"**<**" = Values Below Detection Limit (**DL**)
Bolded values indicate detection

- Perfluoroalkyl Carboxylic Acids (**PFCAs**)
- Perfluoroalkane Sulfonic Acids (**PFSAs**)
- Perfluoroalkane Sulfonamides (**FASAs**)
- Fluorotelomer Sulfonic Acids (**FTSAs**)
- N-Ethyl Perfluoroalkane Sulfonamidoacetic Acids (**EtFASAAs**)
- N-Methyl Perfluoroalkane Sulfonamidoacetic Acids (**MeFASAAs**)

PFBA = Perfluorobutanoic acid
PFPeA = Perfluoropentanoic acid
PFHxA = Perfluorohexanoic acid
PFHpA = Perfluoroheptanoic acid
PFOA = Perfluorooctanoic acid
PFNA = Perfluorononanoic acid
PFDA = Perfluorodecanoic acid
PFUnDA = Perfluoroundecanoic acid
PFDoDA = Perfluorododecanoic acid
PFTrDA = Perfluorotridecanoic acid
PFTeDA = Perfluorotetradecanoic acid
PFBS = Perfluorobutane sulfonic acid
PFPeS = Perfluoropentane sulfonic acid
PFHxS = Perfluorohexane sulfonic acid
PFHpS = Perfluoroheptane sulfonic acid
PFOS = Perfluorooctane sulfonic acid
PFNS = Perfluorononane sulfonic acid
PFDS = Perfluorodecane sulfonic acid
FOSA = Perfluorooctane sulfonamide
4:2 FTSA = 4:2 Fluorotelomer sulfonic acid
6:2 FTSA = 4:2 Fluorotelomer sulfonic acid
8:2 FTSA = 4:2 Fluorotelomer sulfonic acid
EtFOSAA = N-Ethyl perfluorooctane sulfonamidoacetic acid
MeFOSAA = N-Methyl perfluorooctane sulfonamidoacetic acid

Rule 57 Water Quality Standards (WQS) (ng/L)

	PFOA	PFOS
Human Noncancer Value (HNV) (non-drinking water source)	12,000	12
Final Chronic Value (FCV)	880,000	140,000
Final Acute Value (FAV)	15,000,000	1,600,000
Aquatic Maximum Value (AMV)	7,700,000	780,000

- # Concentration exceeds Rule 57 WQS: HNV
- # Concentration exceeds Rule 57 WQS: FCV and HNV
- # Concentration exceeds Rule 57 WQS: FAV, FCV and HNV
- # Concentration exceeds Rule 57 WQS: AMV, FAV, FCV and HNV

s

Table 4

Parcel ID: 07S08W10-CA03, 07S08W11-CA04 and CA05

Groundwater PFAS Analytical Results Summary

Groundwater Sample	Sample Date	Site Code	Total PFAS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFNS	PFDS	FOSA	4:2 FTSA	6:2 FTSA	8:2 FTSA	EtFOSAA	MeFOSAA
GW2001141450RAP	1/14/2020	CA03-MW1S	**219.8**	**35.6**	**50.2**	**45.5**	**24.0**	**9.86**	< 2.04	< 2.04	< 2.04	< 2.04	< 2.04	< 2.04	**54.6**	< 2.04	< 2.04	< 2.04	< 2.04	< 2.04	< 2.04	< 2.04	< 2.04	< 2.04	< 2.04	< 2.04	< 2.04
GW2001141525RAP	1/14/2020	CA03-MW1D	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02
GW2001161030RAP	1/16/2020	CA04-MW1S	**10.69**	**4.45**	**2.02**	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	**4.22**	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02	< 2.02
GW2001161145RAP	1/16/2020	CA04-MW1D	**6.30**	**2.33**	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95	**3.97**	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95	< 1.95
GW2001161305RAP	1/16/2020	CA05-MW1S	**2.84**	**2.84**	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05	< 2.05
GW2001161400RAP	1/16/2020	CA05-MW1D	**2.59**	**2.59**	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01
GW2001161500RAP	1/16/2020	CA05-MW2S	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93	< 1.93
GW2001161500RAP-FD	1/16/2020	CA05-MW2S	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01	< 2.01
GW2001161615RAP	1/16/2020	CA05-MW2D	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99	< 1.99

All values are in nanograms per liter (**ng/L**) or parts per trillion (**ppt**)
"**<**" = Values Below Detection Limit (**DL**)
Bolded values indicate detection

EGLE Part 201 Drinking Water Criteria (DWC) (ng/L)
PFOA = 8; PFOS = 16; PFNA =6; PFHxS=51
PFHxA = 400,000; PFBS = 420

EGLE Part 201 Groundwater Surfacewater Interface (GSI) Criteria (ng/L)
(Surface water not used for drinking water - Non-drink)
PFOA = 12,000
PFOS = 12

Perfluoroalkyl Carboxylic Acids (**PFCAs**)
Perfluoroalkane Sulfonic Acids (**PFSAs**)
Perfluoroalkane Sulfonamides (**FASAs**)
Fluorotelomer Sulfonic Acids (**FTSAs**)
N-Ethyl Perfluoroalkane Sulfonamidoacetic Acids (**EtFASAAs**)
N-Methyl Perfluoroalkane Sulfonamidoacetic Acids (**MeFASAAs**)

PFBA = Perfluorobutanoic acid
PFPeA = Perfluoropentanoic acid
PFHxA = Perfluorohexanoic acid
PFHpA = Perfluoroheptanoic acid
PFOA = Perfluorooctanoic acid
PFNA = Perfluorononanoic acid
PFDA = Perfluorodecanoic acid
PFUnDA = Perfluoroundecanoic acid
PFDoDA = Perfluorododecanoic acid
PFTrDA = Perfluorotridecanoic acid
PFTeDA = Perfluorotetradecanoic acid
PFBS = Perfluorobutane sulfonic acid
PFPeS = Perfluoropentane sulfonic acid
PFHxS = Perfluorohexane sulfonic acid
PFHpS = Perfluoroheptane sulfonic acid
PFOS = Perfluorooctane sulfonic acid
PFNS = Perfluorononane sulfonic acid
PFDS = Perfluorodecane sulfonic acid
FOSA = Perfluorooctane sulfonamide
4:2 FTSA = 4:2 Fluorotelomer sulfonic acid
6:2 FTSA = 4:2 Fluorotelomer sulfonic acid
8:2 FTSA = 4:2 Fluorotelomer sulfonic acid
EtFOSAA = N-Ethyl perfluorooctane sulfonamidoacetic acid
MeFOSAA = N-Methyl perfluorooctane sulfonamidoacetic acid

Concentration exceeds DWC criteria
Concentration exceeds GSI criteria
Concentration exceeds both DWC and GSI criteria

Table 5

Parcel ID: 07S08W10-CA03, 07S08W11-CA04 and CA05

Lithology and Stabilized Water Quality Parameters

Groundwater Monitoring Well ID	Field Site	DTW	GW Elevation*	Total PFAS	Lithology Top Screen	Lithology Middle Screen	Lithology Bottom Screen	Sample Screen Interval	pH	Conductivity	Turbidity	D.O	Temperature	ORP
		(ft)	(ft)	(ng/L)				(ft bgs)	SU	uS/cm	NTU	mg/L	°C	mV
GW2001141450RAP	CA03-MW1S	4.80	885.90	**219.76**	Top 1.5' poorly sorted fine sand	No recovery	Bottom 3.5' no recovery	5-10	7.09	0.577	3.95	0.14	8.5	-93.1
GW2001141525RAP	CA03-MW1D	4.55	886.15	ND	Well sorted fine sand	Coarse sand with gravel, no recovery	Coarse sand w/ gravel	21-26	7.58	0.459	5.21	0.12	10.4	-141.0
GW2001161030RAP	CA04-MW1S	4.63	902.55	**10.69**	Silty coarse sand w/ gravel	Poorly sorted coarse sand	Bottom 1.5' no recovery	5-10	6.98	0.546	4.78	0.32	6.7	286.8
GW2001161140RAP	CA04-MW1D	4.87	902.31	**6.30**	Well sorted fine sand	Poorly sorted fine sand	Fine sand with silt	30-35	7.07	0.756	16.23	0.07	10.4	-90.4
GW2001161305RAP	CA05-MW1S	4.45	920.00	**2.84**	Top 1' no recovery	Sandy silt with gravel	Bottom 0.5' sandy lean clay with gravel	4-9	7.09	0.477	7.50	7.59	4.7	218.1
GW2001161400RAP	CA05-MW1D	5.92	918.53	**2.59**	Top 1' sandy fat clay	Sandy silt with gravel	Bottom 0.5' fat clay with sand	14-19	7.37	0.639	8.76	6.90	5.4	251.8
GW2001161500RAP	CA05-MW2S	5.72	918.63	ND	Well sorted fine sand	Well sorted fine sand with silt	Fine sand with silt	8-13	7.06	0.567	3.98	8.85	7.1	268.2
GW2001161500RAP-FD	CA05-MW2S	5.72	918.63	ND	Well sorted fine sand	Well sorted fine sand with silt	Fine sand with silt	8-13	7.06	0.567	3.98	8.85	7.1	268.2
GW2001161615RAP	CA05-MW2D	5.86	918.49	ND	Poorly sorted fine sand with gravel	Poorly sorted fine sand with gravel	Poorly sorted fine sand with gravel	22-27	7.17	0.626	3.88	0.25	9.0	-0.2

ft = Feet
bgs = Below ground surface
SU = Standard Unit
uS/cm = Microseimens/centimeter
NTU = Nephelometric Turbidity Units
mg/L = Milligrams/Liter
°C = Degree Celcius
mV = Millivolt

DTW = Depth to water (from top of well casing)
GW = Groundwater
D.O. = Dissolved Oxygen
ORP = Oxidation-Reduction Potential
*GW Elevation based on estimated values using USGS 1-m Digital Elevation Model

Table 6

Parcel ID: 07S08W10-CA03, 07S08W11-CA04 and CA05

PFAS and TOC Soil Analytical Results Summary

Soil Sample ID	Sample Date	Field Site	Depth (ft bgs)	Total PFAS	Total TOC	Soil Survey	Soil Survey Description
SXDU11904081125RL	4/8/2019	07S08W10-CA03	0.7	16.71	13,000	25B	Branch loamy sand, *Landform* : outwash plains, *Parent material* : loamy and/or sandy over sandy and gravelly outwash
SXDU21904081210RL	4/8/2019	07S08W10-CA03	0.7	15.38	29,000	20	Adrian muck, Landform: depressions on outwash plains, depressions on moraines on outwash plains, Parent material: herbaceous organic material over sandy glaciofluvial deposits
SXDU31904081300RL	4/8/2019	07S08W10-CA03	0.7	10.40	19,000	6	Gilford sandy loam, gravelly subsoil, Landform: glacial drainage channels, Parent material: coarse-loamy drift over sandy and gravelly outwash
SXDU41904081450RL	4/8/2019	07S08W10-CA03	0.7	0.89	13,000	6	Gilford sandy loam, gravelly subsoil, Landform: glacial drainage channels, Parent material: coarse-loamy drift over sandy and gravelly outwash
SXDU11904081825RL	4/8/2019	07S08W11-CA04	0.7	13.30	13,000	25B	Branch loamy sand, Landform: outwash plains, Parent material: loamy and/or sandy over sandy and gravelly outwash
SXDU21904081910RL	4/8/2019	07S08W11-CA04	0.7	3.92	8,100	9A	Matherton sandy loam, Landform: outwash plains, Parent material: loamy over sandy and gravelly outwash
SXDU11904081700RL	4/8/2019	07S08W11-CA05	0.7	7.00	6,500	5B	Hillsdale-Riddles fine sandy loams, Landform: till plains, moraines, Parent material: loamy till
SXDU21904081755RL	4/8/2019	07S08W11-CA05	0.70	6.28	6,800	15B	Locke fine sandy loam, Landform: till plains, Profile: 0-9” fine sandy loam, 9-31” sandy clay loam, 31-60” sandy loam

ft bgs = Feet below ground surface
ND = Non Detect
TOC = Total Organic Carbon
PFAS soil concentrations are reported as ug/Kg or ppb
TOC concentrations reported as mg/Kg or ppm

5B = Hillsdale-Riddles fine sandy loams
6 = Gilford sandy loam
9A = Matherton sandy loam
15B = Locke fine sandy loam
20 = Adrian muck
25B = Branch loamy sand

Appendix A

AECOM FIELD BOREHOLE LOG

BOREHOLE NO: **CA03-MW1**
TOTAL DEPTH: **35 FT**

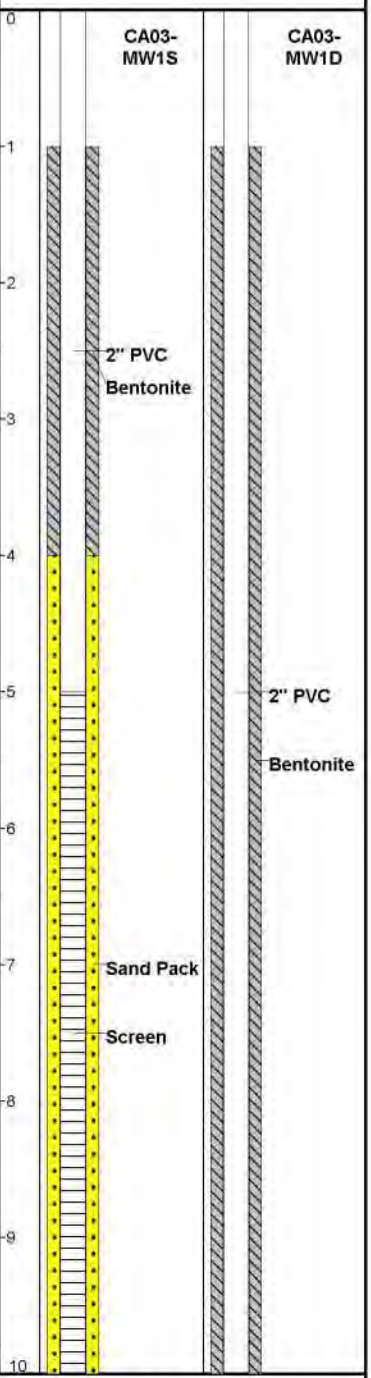
PROJECT INFORMATION

PROJECT:	**Statewide WWTP Biosolids PFAS Eval**
SITE LOCATION:	**Bronson, MI**
PROJECT NO.:	**60588767**
PROJECT MANAGER:	**Matt Vander Eide**
LOGGED BY:	**Russell Platte**
CREATED BY:	**Kaitlyn Eicholtz**

DRILLING INFORMATION

CONTRACTOR:	**Mateco**
CREW CHIEF:	**Mitch Slachter**
DRILL RIG TYPE:	**Geoprobe 7822**
DRILLING METHOD:	**Direct Push**
HOLE DIAMETER:	**2 1/4"**
DATE START:	**1/6/20 13:05**
DATE END:	**1/6/20 16:10**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION
0	Hand Auger				OL	OL: 10YR 2/1 ORGANIC SOIL, Topsoil, roots
					CH	CH: 10YR 2/2 WELL SORTED FAT CLAY, high plasticity, sub rounded sand grains, 85% clay, 15% silt, trace fine sand
					SM	SM: 10YR 3/4 WELL SORTED SILTY FINE SAND, low plasticity, sub rounded sand grains, 20% clay, 25% silt, 30% fine sand, 15% medium sand, 10% coarse sand
▼					SP	SP: N3 WELL SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 60% fine sand, 35% medium sand, 5% coarse sand, wet from 5ft bgs
5					SW	SW: 10YR 4/1 POORLY SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains and gravel, trace silt, 50% fine sand, 35% medium sand, 15% coarse sand, trace fine gravel, loose, wet
	Direct Push					No Recovery
10						SW: 10YR 4/1 POORLY SORTED FINE SAND, non plastic, sub rounded to sub

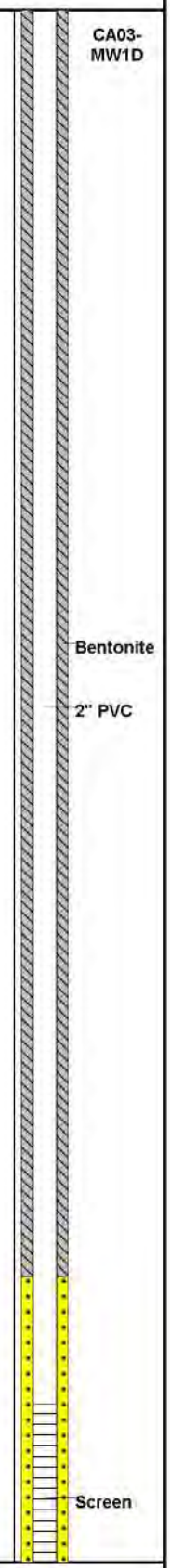


FIELD BOREHOLE LOG

BOREHOLE NO: **CA03-MW1**
TOTAL DEPTH: **35 FT**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION
	Direct Push				SW	angular sand grains and sub rounded gravel, trace silt, 50% fine sand, 35% medium sand, 15% coarse sand, trace fine gravel, loose, wet
					SW	SW: 10YR 4/1 POORLY SORTED COARSE SAND WITH GRAVEL, non plastic, sub rounded sand grains and gravel, trace silt, 10% fine sand, 15% medium sand, 55% coarse sand, 15% fine gravel, 5% coarse gravel
						No Recovery
15					SW	SW: 10YR 4/1 POORLY SORTED COARSE SAND WITH GRAVEL, non plastic, sub rounded sand grains and gravel, trace silt, 10% fine sand, 15% medium sand, 55% coarse sand, 15% fine gravel, 5% coarse gravel
					ML	ML: 10YR 4/1 WELL SORTED SILT, medium plasticity, sub rounded sand grains and gravel, 30% clay, 60% silt, 10% fine sand, trace fine gravel
						No Recovery
20					ML	ML: 10YR 4/1 WELL SORTED SILT, medium plasticity, sub rounded sand grains and gravel, 30% clay, 60% silt, 10% fine sand, trace fine gravel
					SP	SP: 10YR 4/1 WELL SORTED FINE SAND, non plastic, sub rounded sand grains and gravel, trace silt, 90% fine sand, 5% medium sand, 5% coarse sand, trace fine gravel, gravel average 5mm, dense, wet

WELL CONSTRUCTION



FIELD BOREHOLE LOG

BOREHOLE NO: **CA03-MW1**
TOTAL DEPTH: **35 FT**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
	Direct Push				SW	SW: 10YR 4/1 POORLY SORTED COARSE SAND WITH GRAVEL, non plastic, sub rounded sand grains and gravel, trace silt, 15% fine sand, 25% medium sand, 35% coarse sand, 10% fine gravel, 15% coarse gravel, gravel range 5mm to 35mm, very loose, wet	CA03-MW1D Sand Pack
						No Recovery	Screen
25					SW	SW: 10YR 4/1 POORLY SORTED COARSE SAND WITH GRAVEL, non plastic, sub rounded sand grains and gravel, trace silt, 10% fine sand, 20% medium sand, 35% coarse sand, 25% fine gravel, 10% coarse gravel, gravel range 5mm to 35mm, very loose, wet	
	Direct Push				CH	CH: 10YR 5/2 WELL SORTED FAT CLAY, high plasticity, sub rounded sand grains and gravel, 75% clay, 10% silt, 5% fine sand, 5% medium sand, trace coarse sand, trace fine gravel	
						No Recovery	
30					CH	CH: 10YR 5/2 WELL SORTED FAT CLAY, high plasticity, sub rounded sand grains and gravel, 75% clay, 10% silt, 5% fine sand, 5% medium sand, trace coarse sand, trace fine gravel	
	Direct Push					No Recovery	

FIELD BOREHOLE LOG

BOREHOLE NO: **CA03-MW1**
TOTAL DEPTH: **35 FT**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
35						35	

AECOM FIELD BOREHOLE LOG

BOREHOLE NO: **CA04-MW1**
TOTAL DEPTH: **44.5 FT**

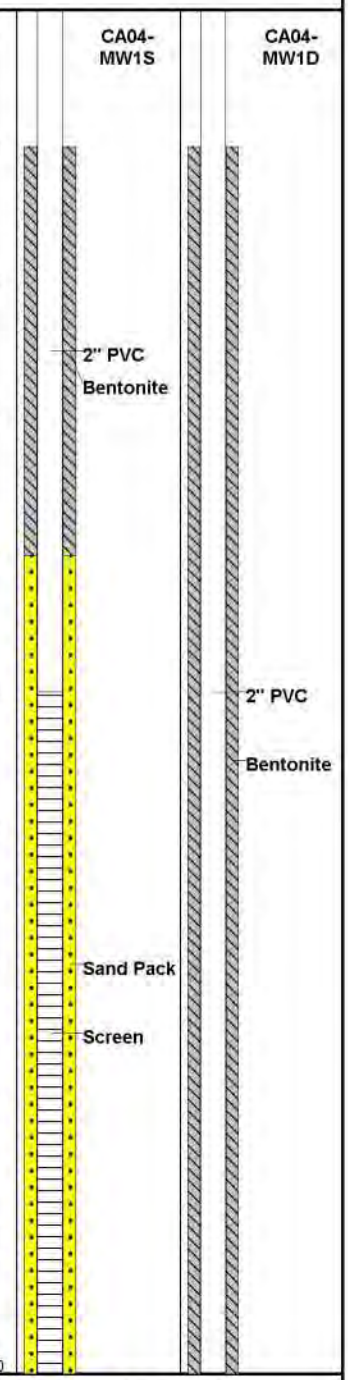
PROJECT INFORMATION

PROJECT:	**Statewide WWTP Biosolids PFAS Eval**
SITE LOCATION:	**Bronson, MI**
PROJECT NO.:	**60588767**
PROJECT MANAGER:	**Matt Vander Eide**
LOGGED BY:	**Russell Platte**
CREATED BY:	**Kaitlyn Eicholtz**

DRILLING INFORMATION

CONTRACTOR:	**Mateco**
CREW CHIEF:	**Mitch Slachter**
DRILL RIG TYPE:	**Geoprobe 7822**
DRILLING METHOD:	**Direct Push**
HOLE DIAMETER:	**2 1/4"**
DATE START:	**12/19/19 09:35**
DATE END:	**12/19/19 11:45**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION
0	Hand Auger				OL	OL: 10YR 2/1 ORGANIC SOIL, Topsoil, moist, frozen, trace roots
					SP-SM	SP-SM: 10YR 4/2 WELL SORTED COARSE SAND WITH SILT, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 10% silt, 20% fine sand, 25% medium sand, 45% coarse sand, trace fine gravel, trace coarse gravel, loose, moist
▼					SW-SM	SW-SM: 10YR 4/2 POORLY SORTED COARSE SAND WITH SILT AND GRAVEL, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 10% silt, 15% fine sand, 25% medium sand, 35% coarse sand, 10% fine gravel, 5% coarse gravel, loose, moist, wet from 4.5ft bgs
5					SM	SM: 10YR 4/2 POORLY SORTED SILTY COARSE SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 20% silt, 10% fine sand, 15% medium sand, 30% coarse sand, 15% fine gravel, 10% coarse gravel, gravel range 5mm to 20mm, loose, wet
	Direct Push				SW	SW: 10YR 4/2 POORLY SORTED COARSE SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 5% silt, 10% fine sand, 35% medium sand, 45% coarse sand, 5% fine gravel, trace coarse gravel, loose, wet
					SP	SP: 10YR 4/2 WELL SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 60% fine sand, 25% medium sand, 15% coarse sand, loose, wet
10						No Recovery



FIELD BOREHOLE LOG

BOREHOLE NO: **CA04-MW1**
TOTAL DEPTH: **44.5 FT**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
	Direct Push				SW	SW: 10YR 4/2 POORLY SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, trace silt, 50% fine sand, 25% medium sand, 15% coarse sand, 5% fine gravel, 5% coarse gravel, gravel range 5mm to 25mm, loose, wet	CA04-MW1D
						No Recovery	
15					SW	SW: 10YR 4/2 POORLY SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, trace silt, 50% fine sand, 25% medium sand, 15% coarse sand, 5% fine gravel, 5% coarse gravel	
					SP	SP: 10YR 4/2 WELL SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 60% fine sand, 35% medium sand, 5% coarse sand	Bentonite 2" PVC
					SW	SW: 10YR 4/2 POORLY SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, trace silt, 50% fine sand, 25% medium sand, 20% coarse sand, 5% fine gravel, trace coarse gravel	
						No Recovery	
20					SW	SW: 10YR 4/2 POORLY SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, trace silt, 25% fine sand, 55% medium sand, 15% coarse sand, 5% fine gravel, loose, wet	
					SP	SP: 10YR 4/2 WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 35% fine sand, 55% medium sand, 10% coarse sand	

FIELD BOREHOLE LOG

BOREHOLE NO: **CA04-MW1**
TOTAL DEPTH: **44.5 FT**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
	Direct Push				SW	SW: 10YR 4/2 POORLY SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, trace silt, 25% fine sand, 55% medium sand, 15% coarse sand, 5% fine gravel	CA04-MW1D
						No Recovery	
25					GW	GW: 10YR 5/2 POORLY SORTED FINE GRAVEL WITH SAND, non plastic, sub rounded sand grains and gravel, trace silt, trace fine sand, 5% medium sand, 20% coarse sand, 60% fine gravel, 15% coarse gravel, gravel range 5mm to 50mm, loose, wet	
					SW	SW: 10YR 5/2 POORLY SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, trace silt, 70% fine sand, 15% medium sand, 5% coarse sand, 5% fine gravel, 5% coarse gravel, gravel range 5mm to 25mm, loose, wet	Bentonite 2" PVC
					SP	SP: 10YR 5/2 WELL SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 80% fine sand, 15% medium sand, 5% coarse sand, loose, wet	
						No Recovery	
30					SP	SP: 10YR 5/2 WELL SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 70% fine sand, 20% medium sand, 10% coarse sand, loose, wet	
					SW	SW: 10YR 5/2 POORLY SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, trace silt, 55% fine sand, 25% medium sand, 15% coarse sand, 5% fine gravel, loose, wet	Sand Pack Screen
					SP	SP: 10YR 5/2 WELL SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 100% fine sand, loose, wet, 10YR 5/2 80% clay and 20% silt lenses at 33.3ft bgs and 34.3ft bgs (lenses approximately 6cm in thickness)	
					SW-SM	SW-SM: 10YR 5/2 POORLY SORTED FINE SAND WITH SILT, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 10% silt, 50% fine sand, 20% medium sand, 10% coarse sand, 5% fine gravel, 5% coarse gravel, loose, wet	

FIELD BOREHOLE LOG

BOREHOLE NO: **CA04-MW1**
TOTAL DEPTH: **44.5 FT**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
35	Direct Push					No Recovery	Screen CA04-MW1D
					ML	ML: 10YR 4/2 POORLY SORTED SILT WITH SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 30% clay, 45% silt, 20% fine sand, 5% medium sand, trace coarse sand, trace fine gravel, trace coarse gravel, stiff, moist, loose wet sand lenses at 36.5ft bgs and 37.5ft bgs (lenses approximately 6cm in thickness)	
40	Direct Push				ML	ML: 10YR 4/2 POORLY SORTED SILT WITH SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 35% clay, 40% silt, 10% fine sand, 5% medium sand, trace coarse sand, 5% fine gravel, 5% coarse gravel, stiff, loose wet sand lens at 44.5ft bgs (lens approximately 6cm in thickness)	

35 36 37 38 39 40 41 42 43 44

AECOM FIELD BOREHOLE LOG

BOREHOLE NO: **CA05-MW1**
TOTAL DEPTH: **25 FT**

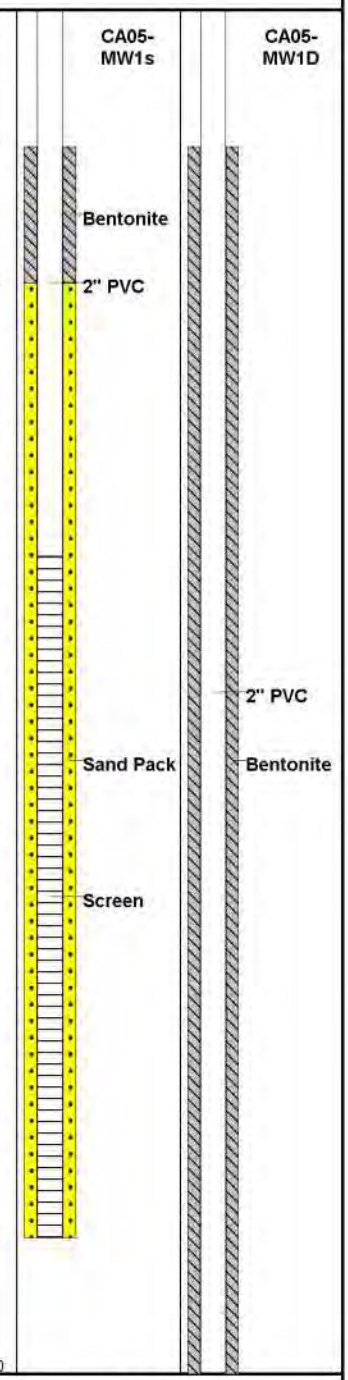
PROJECT INFORMATION

PROJECT:	**Statewide WWTP Biosolids PFAS Eval**
SITE LOCATION:	**Bronson, MI**
PROJECT NO.:	**60588767**
PROJECT MANAGER:	**Matt Vander Eide**
LOGGED BY:	**Russell Platte**
CREATED BY:	**Kaitlyn Eicholtz**

DRILLING INFORMATION

CONTRACTOR:	**Mateco**
CREW CHIEF:	**Zack Martin**
DRILL RIG TYPE:	**Geoprobe 7822**
DRILLING METHOD:	**Direct Push**
HOLE DIAMETER:	**2 1/4"**
DATE START:	**1/2/20 16:55**
DATE END:	**1/3/20 09:40**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION
0	Hand Auger				OL	OL: 10YR 2/2 ORGANIC SOIL, trace fine sand, Topsoil, moist, trace roots
					CH	CH: 10YR 4/6 WELL SORTED FAT CLAY, high plasticity, sub rounded to sub angular sand grains, 50% clay, 40% silt, 10% fine sand
						No Recovery
5	Direct Push				ML	ML: 10YR 5/4 POORLY SORTED SANDY SILT WITH GRAVEL, low plasticity, sub rounded to sub angular sand and sub rounded gravel, 25% clay, 35% silt, 10% fine sand, 10% medium sand, 5% coarse sand, 10% fine gravel, 5% coarse gravel, stiff, moist
						CL: 10YR 5/4 POORLY SORTED SANDY LEAN CLAY WITH GRAVEL, medium plasticity, sub rounded to sub angular sand grains and sub rounded gravel, 35% clay, 25% silt, 10% fine sand, 10% medium sand, 5% coarse sand, 10% fine gravel, 5% coarse gravel, gravel range 5mm to 35mm, stiff, moist
10						

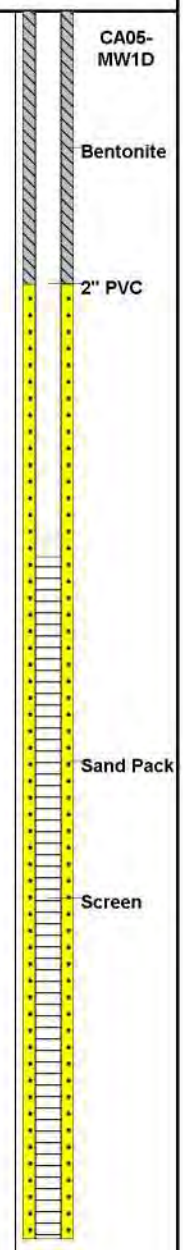


FIELD BOREHOLE LOG

BOREHOLE NO: **CA05-MW1**
TOTAL DEPTH: **25 FT**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION
	Direct Push				CL	
					CH	CH: 10YR 5/4 POORLY SORTED SANDY FAT CLAY, high plasticity, sub rounded to sub angular sand grains and sub rounded gravel, 50% clay, 20% silt, 15% fine sand, 5% medium sand, 5% coarse sand, 5% fine gravel, trace coarse gravel, gravel range 5mm to 35mm, very stiff, moist
15	Direct Push				ML	ML: 10YR 4/2 POORLY SORTED SANDY SILT WITH GRAVEL, low plasticity, sub rounded to sub angular sand grains and gravel, 25% clay, 35% silt, 10% fine sand, 10% medium sand, 5% coarse sand, 10% fine gravel, 5% coarse gravel, gravel range 5 to 30mm, stiff, moist
					CH	CH: 10YR 4/2 POORLY SORTED FAT CLAY WITH SAND, high plasticity, sub rounded to sub angular sand grains and sub rounded gravel, 60% clay, 25% silt, 5% fine sand, 5% medium sand, 5% coarse sand, trace fine gravel, gravel range 5mm to 15mm, very stiff, moist
20	Direct Push				CH	CH: 10YR 4/2 POORLY SORTED FAT CLAY WITH GRAVEL, high plasticity, sub rounded to sub angular sand grains and sub rounded gravel, 55% clay, 20% silt, 10% fine sand, trace medium sand, trace coarse sand, 10% fine gravel, 5% coarse gravel, gravel range 5mm to 40mm, very stiff, moist

WELL CONSTRUCTION



FIELD BOREHOLE LOG

BOREHOLE NO: **CA05-MW1**
TOTAL DEPTH: **25 FT**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
25	Direct Push				CH		23 24 25

FIELD BOREHOLE LOG

BOREHOLE NO: **CA05-MW2**
TOTAL DEPTH: **48 FT**

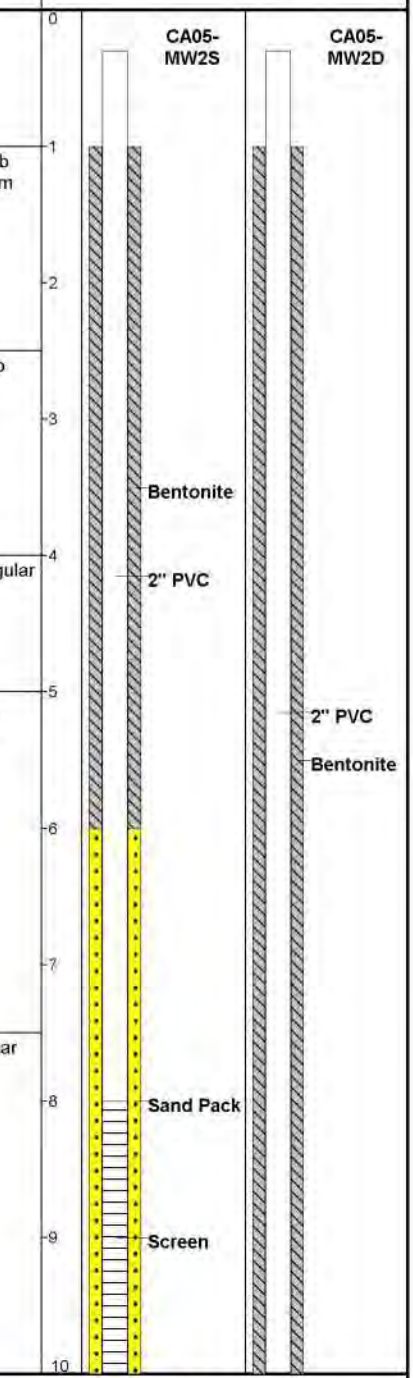
PROJECT INFORMATION

PROJECT:	**Statewide WWTP Biosolids PFAS Eval**
SITE LOCATION:	**Bronson, MI**
PROJECT NO.:	**60588767**
PROJECT MANAGER:	**Matt Vander Eide**
LOGGED BY:	**Russell Platte**
CREATED BY:	**Kaitlyn Eicholtz**

DRILLING INFORMATION

CONTRACTOR:	**Mateco**
CREW CHIEF:	**Mitch Slachter**
DRILL RIG TYPE:	**Geoprobe 7822**
DRILLING METHOD:	**Direct Push**
HOLE DIAMETER:	**4 1/4"**
DATE START:	**12/20/19 10:55**
DATE END:	**12/20/19 14:15**

DEPTH	SAMPLE TYPE	ATTEMPT / RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION
0	Hand Auger			OL	OL: 10YR 3/3 ORGANIC SOIL, Topsoil, loose, moist, trace roots
				SM	SM: 10YR 5/6 WELL SORTED SILTY FINE SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 15% silt, 50% fine sand, 20% medium sand, 10% coarse sand, 5% fine gravel, trace coarse gravel, loose, moist
				SM	SM: 10YR 4/6 WELL SORTED SILTY MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 15% silt, 20% fine sand, 50% medium sand, 15% coarse sand, trace fine gravel, loose, moist
				CL	CL: 10YR 4/6 WELL SORTED LEAN CLAY, low plasticity, sub rounded to sub angular sand grains, 80% clay, 15% silt, 5% fine sand, trace medium sand, trace coarse sand
5	Direct Push			SW	SW: 10YR 4/6 POORLY SORTED FINE SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, trace silt, 40% fine sand, 20% medium sand, 25% coarse sand, 10% fine gravel, 5% coarse gravel, loose, moist, wet from 7ft bgs
				SP	SP: 10YR 4/6 WELL SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains and gravel, trace silt, 75% fine sand, 10% medium sand, 5% coarse sand, 5% fine gravel, 5% coarse gravel, loose, wet
10					



FIELD BOREHOLE LOG

BOREHOLE NO: **CA05-MW2**
TOTAL DEPTH: **48 FT**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
	Direct Push				SP-SM	SP-SM: 10YR 5/4 WELL SORTED FINE SAND WITH SILT, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 10% silt, 85% fine sand, 5% medium sand, trace coarse sand, trace fine gravel, medium dense, wet	CA05-MW2S
					SP-SM	SP-SM: 10YR 5/4 WELL SORTED FINE SAND WITH SILT, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 10% silt, 75% fine sand, 5% medium sand, 5% coarse sand, 5% fine gravel, trace coarse gravel, medium dense, wet	Sand Pack Screen
					SW	SW: 10YR 5/4 POORLY SORTED FINE SAND WITH GRAVEL, non plastic, sub angular sand grains and sub rounded to sub angular gravel, trace silt, 30% fine sand, 25% medium sand, 25% coarse sand, 10% fine gravel, 10% coarse gravel, loose, wet	CA05-MW2D
						No Recovery	
15					SW	SW: 10YR 5/4 POORLY SORTED FINE SAND WITH GRAVEL, non plastic, sub angular sand grains and sub rounded to sub angular gravel, trace silt, 30% fine sand, 25% medium sand, 25% coarse sand, 10% fine gravel, 10% coarse gravel, loose, wet	Bentonite
					SW	SW: 10YR 5/2 POORLY SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, trace silt, 25% fine sand, 45% medium sand, 20% coarse sand, 10% fine gravel, trace coarse gravel, medium dense, wet	2" PVC
					SP	SP: 10YR 5/2 WELL SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 100% fine sand, trace medium sand, medium dense, wet	
						No Recovery	
20					SP	SP: 10YR 5/2 WELL SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 100% fine sand, trace medium sand, medium dense, wet	Sand Pack
						SW: 10YR 5/2 POORLY SORTED FINE SAND WITH GRAVEL, non plastic, sub	

FIELD BOREHOLE LOG

BOREHOLE NO: **CA05-MW2**
TOTAL DEPTH: **48 FT**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
	Direct Push				SW	rounded to sub angular sand grains and gravel, trace silt, 55% fine sand, 15% medium sand, 10% coarse sand, 15% fine gravel, 5% coarse gravel, medium dense, wet	CA05-MW2D; Screen; Sand Pack
25	Direct Push				CH	CH: 10YR 5/2 POORLY SORTED FAT CLAY, high plasticity, sub rounded to sub angular sand grains and gravel, 70% clay, 15% silt, trace fine sand, trace medium sand, 5% coarse sand, 10% fine gravel, trace coarse gravel, moist	
						No Recovery	
30	Direct Push				CH	CH: 10YR 5/2 POORLY SORTED FAT CLAY, high plasticity, sub rounded to sub angular sand grains and gravel, 70% clay, 15% silt, trace fine sand, trace medium sand, 5% coarse sand, 10% fine gravel, trace coarse gravel, moist	
					SM	SM: 10YR 5/2 POORLY SORTED SILTY FINE TO MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 15% silt, 30% fine sand, 30% medium sand, 20% coarse sand, 5% fine gravel, loose, wet	
					ML	ML: 10YR 5/2 POORLY SORTED SANDY SILT, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 25% clay, 30% silt, 30% fine sand, 10% medium sand, 5% coarse sand, trace fine gravel, stiff, moist	
						No Recovery	

FIELD BOREHOLE LOG

BOREHOLE NO: **CA05-MW2**
TOTAL DEPTH: **48 FT**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
35	Direct Push				CH	CH: 10YR 5/2 POORLY SORTED FAT CLAY, high plasticity, sub rounded to sub angular sand grains and gravel, 70% clay, 15% silt, trace fine sand, trace medium sand, 5% coarse sand, 10% fine gravel, trace coarse gravel, moist	
					ML	ML: 10YR 5/2 POORLY SORTED SANDY SILT, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 25% clay, 30% silt, 30% fine sand, 10% medium sand, 5% coarse sand, trace fine gravel, stiff, moist	
40					SP	SP: 10YR 5/2 WELL SORTED COARSE SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, trace silt, 10% fine sand, 15% medium sand, 70% coarse sand, 5% fine gravel	
					SM	SM: 10YR 5/2 WELL SORTED SILTY FINE SAND, non plastic, sub rounded to sub angular sand grains, trace clay, 30% silt, 70% fine sand	
						No Recovery	
45	rect Push				ML	ML: 10YR 5/2 POORLY SORTED SANDY SILT, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, 10% clay, 45% silt, 10% fine sand, 10% medium sand, 15% coarse sand, 10% fine gravel, trace coarse gravel	

FIELD BOREHOLE LOG

BOREHOLE NO: **CA05-MW2**
TOTAL DEPTH: **48 FT**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
	D						

47

48

Appendix B

AECOM

Low Flow Ground Water Sample Collection Record

Well ID: CA03-MW15

Client: EGLE
Project: Statewide Biosolids PFAS Evaluation
Project #: 60588767

INSPECTION

Label on well?	(YES)	NO	NA	Is cap locked?	(YES)	NO	NA
Is reference mark visible?	(YES)	NO	NA	Standing water present?	YES	(NO)	NA
Condition of well	Good			Any indication of surface runoff in well?	YES	(NO)	NA
Weather	cloudy			Air Temperature:	38°F		

Notes:

STATIC WATER LEVEL PRIOR TO PURGING

Date: 1-14-20 Time: 1410 (AM/PM)

Depth to Water: 4.80 Measured with: (Electronic Tape) Chalk & Steel Tape

Length of Well: 13.55 Decontamination: Pre Steam Cleaned (DI Water) Other

WELL PURGING

Date: 1-14-20 Begin Time: 1415 (AM/PM) Purging Equipment: Peristaltic Pump

End Time: 1455 AM/PM Decontamination: Pre Steam Cleaned DI Water Other (New Tubing)

CALCULATION OF 1 CASING VOLUME

13.55 ft. Length of well — Yield: (HIGH) LOW

4.80 ft. - depth of water (before purge start) — If low, recovery time:

8.75 ft. =length of water column

x conversion factor (2" well) 0.16 — Actual volume purged 2.8 gallons

1.4 Gal. =1 casing volume — Actual purge flow rate 250 ml/min or L/min

Notes

Time	Volume (gallons)	Depth to Water (Feet) <0.33'	PH (SU) +/- 0.1	Conductivity (mS/cm) +- 3%	Turbidity (NTU) +- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5 %	ORP (°C) +/- 10mV
Start: 1425	1.3	4.82	7.10	0.578	8.45	0.20	8.4	-74.9
1430	1.6	4.82	7.11	0.578	4.20	0.15	8.5	-82.6
1435	1.9	4.82	7.08	0.577	5.00	0.13	8.4	-89.5
1440	2.2	4.81	7.09	0.577	4.78	0.13	8.5	-90.8
1445	2.5	4.81	7.09	0.577	3.95	0.14	8.5	-93.1
Final:								

SAMPLE COLLECTION

Date: 1-14-20 Time: 1450 AM/PM Method Submersible Pump Sample ID: GW20001141450RA

Appearance of Sample: Clear Actual Sample Flow Rate: 250 ml/min or L/min

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

SAMPLING PERSONNEL

Name Russell Platte Company: AECOM

AECOM

Low Flow Ground Water Sample Collection Record

Well ID: CA03-MW1D

Client: EGLE
Project: Statewide Biosolids PFAS Evaluation
Project #: 60588767

INSPECTION

Label on well?	YES	NO	NA	Is cap locked?	YES	NO	NA
Is reference mark visible?	YES	NO	NA	Standing water present?	YES	NO	NA
Condition of well	Good			Any indication of surface runoff in well?	YES	NO	NA
Weather	Cloudy			Air Temperature:	38°F		

Notes:

STATIC WATER LEVEL PRIOR TO PURGING

Date: 1-14-20 Time: 1450 AM/PM

Depth to Water: 4.55
Length of Well: 29.73

Measured with: Electronic Tape / Chalk & Steel Tape
Decontamination: Pre Steam Cleaned / DI Water / Other

WELL PURGING

Date: 1-14-20 Begin Time: 1455 AM/PM End Time: 1530 AM/PM

Purging Equipment: Peristaltic Pump
Decontamination: Pre Steam Cleaned / DI Water / Other / New Tubing

CALCULATION OF 1 CASING VOLUME

29.73 ft. Length of well
4.55 ft. - depth of water (before purge start)
25.18 ft. =length of water column
x conversion factor (2" well) 0.16
4.03 Gal. =1 casing volume

Yield: HIGH / LOW
If low, recovery time: NA

Actual volume purged: 2.5 gallons
Actual purge flow rate: 250 ml/min or L/min

Notes

Time	Volume (gallons)	Depth to Water (Feet) <0.33'	PH (SU) +/- 0.1	Conductivity (mS/cm) +- 3%	Turbidity (NTU) +- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5 %	ORP (°C) +/- 10mV
Start: 1505	1.3	4.56	7.56	0.458	1.50	0.23	10.2	-116.8
1510	1.6	4.56	7.57	0.459	2.98	0.13	10.4	-135.1
1515	1.9	4.56	7.56	0.459	5.04	0.11	10.5	-139.3
1520	2.2	4.56	7.58	0.459	5.21	0.12	10.4	-141.0
Final:								

SAMPLE COLLECTION

Date: 1-14-20 Time: 1525 AM/PM Method: Submersible Pump

Sample ID: GW200114 1525 RAP

Appearance of Sample: Clear

Actual Sample Flow Rate: 250 ml/min or L/min

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

SAMPLING PERSONNEL

Name: Russell Platte Company: AECOM

AECOM

Low Flow Ground Water Sample Collection Record

Well ID: DT04-MW1S

CA04-MW1S

Client: EGLE
Project: Statewide Biosolids PFAS Evaluation
Project #: 60588767

INSPECTION

Label on well?	(YES)	NO	NA	Is cap locked?	(YES)	NO	NA
Is reference mark visible?	(YES)	NO	NA	Standing water present?	YES	(NO)	NA
Condition of well	Good			Any indication of surface runoff in well?	YES	(NO)	NA
Weather	Cloudy wind 3-5mph			Air Temperature:	28°F		

Notes:

STATIC WATER LEVEL PRIOR TO PURGING

Date: 1-16-20 Time: 0955 (AM)/PM

Depth to Water: 4.63

Length of Well: 13.11

Measured with: (Electronic Tape) Chalk & Steel Tape

Decontamination: Pre Steam Cleaned (DI Water) Other

WELL PURGING

Date: 1-16-20 Begin Time: 10:00 (AM)/PM End Time: 1030 AM/PM

Purging Equipment: Peristaltic Pump

Decontamination: Pre Steam Cleaned DI Water Other (New Tubing)

CALCULATION OF 1 CASING VOLUME

13.11 ft.	Length of well	
4.63 ft.	- depth of water (before purge start)	
8.48 ft.	=length of water column	
	x conversion factor (2" well) 0.16	
1.36 Gal.	=1 casing volume	

Yield: ~~HIGH~~ LOW

If low, recovery time: NA

Actual volume purged: _____ gallons

Actual purge flow rate: 250 (ml/min) or L/min

Notes

Time	Volume (gallons)	Depth to Water (Feet) <0.33'	PH (SU) +/- 0.1	Conductivity (mS/cm) +- 3%	Turbidity (NTU) +- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5 %	ORP (°C) +/- 10mV
Start: 1010	1.3	4.65	6.96	0.546	3.00	0.52	6.5	296.8
1015	1.6	4.65	6.97	0.545	3.27	0.42	6.7	293.5
1020	2.0	4.65	6.97	0.545	4.09	0.37	6.7	290.5
1025	2.3	4.65	6.98	0.546	4.78	0.32	6.7	286.8
Final:								

SAMPLE COLLECTION

Date: 1-16-20 Time: 1030 (AM)/PM Method: Submersible Pump

SampleID: GW20011610302AP

Appearance of Sample: Clear

Actual Sample Flow Rate: 250 (ml/min) or L/min

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

SAMPLING PERSONNEL

Name: Russell Platte Company: AECOM

AECOM

Low Flow Ground Water Sample Collection Record

Well ID: DT04 - MW1D

CA04-MW1D

Client: EGLE
Project: Statewide Biosolids PFAS Evaluation
Project #: 60588767

INSPECTION

Label on well?	(YES)	NO	NA	Is cap locked?	(YES)	NO	NA
Is reference mark visible?	(YES)	NO	NA	Standing water present?	YES	(NO)	NA
Condition of well	Good			Any indication of surface runoff in well?	YES	(NO)	NA
Weather	Cloudy			Air Temperature:	28°F		

Notes:

STATIC WATER LEVEL PRIOR TO PURGING

Date: 1-16-20 Time: 1035 (AM)/PM

Depth to Water: 4.87

Length of Well: 37.77

Measured with: (Electronic Tape) Chalk & Steel Tape

Decontamination: Pre Steam Cleaned (DI Water) Other

WELL PURGING

Date: 1-16-20 Begin Time: 1040 AM/PM End Time: 1145 AM/PM

Purging Equipment: Peristaltic Pump

Decontamination: Pre Steam Cleaned DI Water Other (New Tubing)

CALCULATION OF 1 CASING VOLUME

37.77 ft. Length of well
4.87 ft. - depth of water (before purge start)
32.9 ft. =length of water column
x conversion factor (2" well) 0.16
5.26 Gal. =1 casing volume

Yield: (HIGH) LOW
If low, recovery time: NA

Actual volume purged: 5.3 gallons
Actual purge flow rate: 250 (ml/min) or L/min

Notes

Time	Volume (gallons)	Depth to Water (Feet) <0.33'	PH (SU) +/- 0.1	Conductivity (mS/cm) +- 3%	Turbidity (NTU) +- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5 %	ORP (°C) +/- 10mV
Start: 1050	1.3	4.90	7.08	0.755	28.79	0.17	10.1	11.5
1055	1.7	4.90	7.08	0.754	25.75	0.14	10.1	-40.8
~~1100~~ 1100	2.0	4.90	7.08	0.754	17.57	0.14	10.0	-52.4
1105	2.3	4.90	7.08	0.754	15.24	0.12	10.2	-65.2
1110	2.7	4.90	7.09	0.755	22.63	0.11	10.1	-74.6
1115	3.0	4.90	7.08	0.756	18.23	0.11	10.1	-77.6
1120	3.3	4.90	7.07	0.759	16.78	0.08	10.2	-81.1
1125	3.7	4.90	7.07	0.759	18.23	0.07	10.2	-86.2
1130	4.1	4.90	7.08	0.757	20.12	0.07	10.2	-87.8
1135	4.5	4.90	7.07	0.757	19.56	0.07	10.2	-89.7
Final: 1140	4.9	4.90	7.07	0.756	16.23	0.07	10.4	-90.4

SAMPLE COLLECTION

Date: 1-16-20 Time: 1145 AM/PM Method: Submersible Pump

Sample ID GW200116 1145 RA

Appearance of Sample:

Actual Sample Flow Rate: (ml/min) or L/min

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

SAMPLING PERSONNEL

Name: Russell Platte Company: AECOM

AECOM

Low Flow Ground Water Sample Collection Record

Well ID: CA05-MW 1 S

Client: EGLE
Project: Statewide Biosolids PFAS Evaluation
Project #: 60588767

INSPECTION

Label on well?	YES	NO	NA	Is cap locked?	YES	NO	NA
Is reference mark visible?	YES	NO	NA	Standing water present?	YES	NO	NA
Condition of well	Good			Any indication of surface runoff in well?	YES	NO	NA
Weather	Cloudy wind 5-7mph			Air Temperature:	26°F		

Notes:

STATIC WATER LEVEL PRIOR TO PURGING

Date: 1-16-20 Time: 1155 AM/PM

Depth to Water: 4.46 Measured with: Electronic Tape / Chalk & Steel Tape

Length of Well: 12.19 Decontamination: Pre Steam Cleaned / DI Water / Other

WELL PURGING

Date: 1-16-20 Begin Time: 1200 AM/PM Purging Equipment: Peristaltic Pump

End Time: 1300 AM/PM Decontamination: Pre Steam Cleaned / DI Water / Other / New Tubing

CALCULATION OF 1 CASING VOLUME

12.19	ft.	Length of well	Yield:	HIGH / LOW
4.45	ft.	- depth of water (before purge start)	If low, recovery time:	NA
7.74	ft.	=length of water column		
		x conversion factor (2" well) 0.16	Actual volume purged	2.0 gallons
1.24	Gal.	=1 casing volume	Actual purge flow rate	75 ml/min or L/min

Notes

Time	Volume (gallons)	Depth to Water (Feet) <0.33'	PH (SU) +/- 0.1	Conductivity (mS/cm) +- 3%	Turbidity (NTU) +- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5 %	ORP (°C) +/- 10mV
Start: 1210	0.9	5.47	7.14	0.457	10.84	8.30	4.3	90.7
1215	1.0	5.48	7.09	0.458	12.06	8.17	4.2	114.2
1220	1.1	5.53	7.07	0.462	11.65	7.94	4.2	150.8
1225	1.2	5.60	7.08	0.463	11.29	8.01	4.2	158.3
1230	1.3	5.65	7.08	0.467	10.48	7.75	4.3	178.2
1235	1.4	5.69	7.08	0.469	9.09	7.76	4.2	188.2
1240	1.5	5.72	7.08	0.472	9.35	7.69	4.3	186.8
1245	1.6	5.75	7.08	0.472	8.83	7.68	4.4	196.2
1250	1.7	5.77	7.08	0.472	8.26	7.69	4.3	203.9
1255	1.8	5.80	7.10	0.474	8.54	7.68	4.5	212.3
Final: 1300	1.9	5.83	7.09	0.477	7.50	7.59	4.7	218.1

SAMPLE COLLECTION

Date: 1-16-20 Time: 1305 AM/PM Method: Submersible Pump

Sample ID GW20011613O5RAP

Appearance of Sample: clear Actual Sample Flow Rate: 75 ml/min or L/min

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

SAMPLING PERSONNEL

Name Russell Platte Company: AECOM

AECOM

Low Flow Ground Water Sample Collection Record

Well ID: CA05-MW1D

Client: EGLE
Project: Statewide Biosolids PFAS Evaluation
Project #: 60588767

INSPECTION

Label on well?	YES	NO	NA	Is cap locked?	YES	NO	NA
Is reference mark visible?	YES	NO	NA	Standing water present?	YES	NO	NA
Condition of well	Good			Any indication of surface runoff in well?	YES	NO	NA
Weather	cloudy wind 5-7mph			Air Temperature:	25°F		

Notes:

STATIC WATER LEVEL PRIOR TO PURGING

Date: 1-16-20 Time: 1305 AM/PM

Depth to Water: 5.92
Length of Well: 22.15

Measured with: Electronic Tape / Chalk & Steel Tape
Decontamination: Pre Steam Cleaned / DI Water / Other

WELL PURGING

Date: 1-16-20 Begin Time: 1310 AM/PM End Time: 1405 AM/PM

Purging Equipment: Peristaltic Pump

Decontamination: ~~Pre Steam Cleaned~~ New Tubing / DI Water / Other

CALCULATION OF 1 CASING VOLUME

22.15 ft.	Length of well	Yield:	HIGH LOW
5.92 ft.	- depth of water (before purge start)	If low, recovery time:	NA
16.23 ft.	=length of water column		
	x conversion factor (2" well) 0.16	Actual volume purged	1.1 gallons
2.60 Gal.	=1 casing volume	Actual purge flow rate	60 ml/min or L/min

Notes

Time	Volume (gallons)	Depth to Water (Feet) <0.33'	PH (SU) +/- 0.1	Conductivity (mS/cm) +- 3%	Turbidity (NTU) +- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5 %	ORP (°C) +/- 10mV
Start: 1320	0.7	8.05	7.33	0.629	11.01	6.79	5.2	223.6
1325	0.8	8.15	7.34	0.631	8.91	6.77	4.9	233.9
1330	0.8	8.25	7.35	0.632	9.21	6.76	5.2	237.6
1335	0.9	8.75	7.35	0.633	9.73	6.75	5.4	240.3
1340	0.9	9.25	7.36	0.634	10.85	6.75	5.5	243.1
1345	1.0	10.05	7.37	0.636	9.54	6.74	5.4	245.3
1350	1.0	10.94	7.37	0.635	9.78	6.80	5.5	249.0
1355	1.1	11.82	7.37	0.639	8.76	6.90	5.4	251.8
Final:								

SAMPLE COLLECTION

Date: 1-16-20 Time: 1400 AM/PM Method: Submersible Pump

Appearance of Sample: Clear Actual Sample Flow Rate: 60 ml/min or L/min

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

SAMPLING PERSONNEL

Name: Russell Platte Company: AECOM

AECOM

Low Flow Ground Water Sample Collection Record

Well ID: ~~MW05-MW25~~ CA05-MW2S

Client: EGLE
Project: Statewide Biosolids PFAS Evaluation
Project #: 60588767

INSPECTION

Label on well?	YES	NO	NA	Is cap locked?	YES	NO	NA
Is reference mark visible?	YES	NO	NA	Standing water present?	YES	NO	NA
Condition of well	Good			Any indication of surface runoff in well?	YES	NO	NA
Weather	cloudy wind 3-5 mph			Air Temperature:	24°F		

Notes:

STATIC WATER LEVEL PRIOR TO PURGING

Date: 1-16-20 Time: 1425 AM/PM

Depth to Water: 5.72 Measured with: Electronic Tape / Chalk & Steel Tape

Length of Well: 16.11 Decontamination: Pre Steam Cleaned / DI Water / Other

WELL PURGING

Date: 1-16-20 Begin Time: 1430 AM/PM Purging Equipment: Peristaltic Pump

End Time: 1505 AM/PM Decontamination: Pre Steam Cleaned / DI Water / Other / New Tubing

CALCULATION OF 1 CASING VOLUME

16.11 ft.	Length of well	Yield: HIGH / LOW
5.72 ft.	- depth of water (before purge start)	If low, recovery time: NA
10.39 ft.	=length of water column	
1.66	x conversion factor (2" well) 0.16	Actual volume purged 2.1 gallons
1.66 Gal.	=1 casing volume	Actual purge flow rate 250 ml/min or L/min

Notes

Time	Volume (gallons)	Depth to Water (Feet) <0.33'	PH (SU) +/- 0.1	Conductivity (mS/cm) +- 3%	Turbidity (NTU) +- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5 %	ORP (°C) +/- 10mV
Start: 1440	1.0	5.95	7.07	0.567	5.31	9.11	7.0	258.9
1445	1.3	5.97	7.06	0.567	4.01	9.03	7.0	262.4
1460	1.6	5.99	7.06	0.566	4.13	8.95	7.1	265.5
1455	1.9	6.01	7.06	0.567	3.98	8.85	7.1	268.2
Final:								

SAMPLE COLLECTION

Date: 1-16-20 Time: 1500 AM/PM Method: Submersible Pump

Appearance of Sample: Clear Actual Sample Flow Rate: 250 ml/min or L/min

Sample ID: GW20011615000RAP / GW20011615000RAP-FD

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

SAMPLING PERSONNEL

Name: Russell Platte Company: AECOM

AECOM

Low Flow Ground Water Sample Collection Record

Well ID: CA05-MW2D

Client: EGLE
Project: Statewide Biosolids PFAS Evaluation
Project #: 60588767

INSPECTION

Label on well?	YES	NO	NA	Is cap locked?	YES	NO	NA
Is reference mark visible?	YES	NO	NA	Standing water present?	YES	NO	NA
Condition of well	Good			Any indication of surface runoff in well?	YES	NO	NA
Weather	cloudy wind 5-7mph			Air Temperature:	24°F		

Notes:

STATIC WATER LEVEL PRIOR TO PURGING

Date: 1-16-20 Time: ~~1505~~ 1505 AM/PM

Depth to Water: 5.86 Measured with: Electronic Tape Chalk & Steel Tape

Length of Well: 29.98 Decontamination: Pre Steam Cleaned DI Water Other

WELL PURGING

Date: 1-16-20 Begin Time: 1510 AM/PM Purging Equipment: Peristaltic Pump

End Time: 1620 AM/PM Decontamination: Pre Steam Cleaned DI Water Other
New Tubing

CALCULATION OF 1 CASING VOLUME

29.98 ft.	Length of well	Yield:	HIGH	LOW
5.86 ft.	- depth of water (before purge start)	If low, recovery time:	NA	
24.12 ft.	=length of water column			
	x conversion factor (2" well) 0.16	Actual volume purged	3.8	gallons
3.86 Gal.	=1 casing volume	Actual purge flow rate	200	ml/min or L/min

Notes

Time	Volume (gallons)	Depth to Water (Feet) <0.33'	PH (SU) +/- 0.1	Conductivity (mS/cm) +- 3%	Turbidity (NTU) +- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5 %	ORP (°C) +/- 10mV
Start: 1520	0.9	6.55	7.18	0.629	8.11	0.38	9.4	200.1
1525	1.2	6.57	7.18	0.627	8.23	0.33	8.9	159.0
1530	1.5	6.57	7.18	0.628	9.37	0.30	8.9	129.6
1535	1.7	6.57	7.18	0.626	6.12	0.27	9.1	99.2
1540	2.0	6.57	7.17	0.628	7.34	0.29	8.9	75.2
1545	2.2	6.57	7.17	0.627	6.53	0.27	9.0	62.4
1550	2.5	6.57	7.17	0.627	5.32	0.26	8.9	53.3
1555	2.7	6.57	7.17	0.627	6.38	0.26	8.9	36.0
1600	2.9	6.57	7.17	0.628	5.11	0.26	9.0	20.9
1605	3.2	6.57	7.17	0.628	4.31	0.26	9.0	9.9
Final: 1610	3.5	6.57	7.17	0.626	3.88	0.25	9.0	-0.2

SAMPLE COLLECTION

Date: 1-16-20 Time: 1615 AM/PM Method Submersible Pump Sample ID

Appearance of Sample: Clear Actual Sample Flow Rate: 200 ml/min or L/min

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

SAMPLING PERSONNEL

Name Russell Platte Company: AECOM

Appendix C

07S08W10-CA03 USDA Web Soil Survey – Soil Description

8 – Cohoctah sandy loam, *Landform:* flood plains, *Parent material:* loamy and/or sandy alluvium

25B – Branch loamy sand, *Landform*: outwash plains, *Parent material*: loamy and/or sandy over sandy and gravelly outwash

6 – Gilford sandy loam, gravelly subsoil, *Landform:* glacial drainage channels, *Parent material:* coarse-loamy drift over sandy and gravelly outwash

20 – Adrian muck, *Landform:* depressions on outwash plains, depressions on moraines on outwash plains, *Parent material:* herbaceous organic material over sandy glaciofluvial deposits

07S08W11-CA04 & CA05 USDA Web Soil Survey – Soil Description

11B – Elmdale fine sandy loam, *Landform*: ground moraines, *Parent material*: loamy till

5B – Hillsdale-Riddles fine sandy loams, *Landform*: till plains, moraines, *Parent material*: loamy till

15B – Locke fine sandy loam, *Landform*: till plains, *Profile*: 0-9” fine sandy loam, 9-31” sandy clay loam, 31-60” sandy loam

25B – Branch loamy sand, *Landform*: outwash plains, *Parent material*: loamy and/or sandy over sandy and gravelly outwash

9A – Matherton sandy loam, *Landform*: outwash plains, *Parent material*: loamy over sandy and gravelly outwash

14 – Houghton muck, *Landform*: depressions on outwash plains depressions on moraines on outwash plains, *Parent material*: herbaceous organic material

17 – Barry loam, Landform: depressions on moraines, flats on till plains, drainageways on moraines, Parent material: calcareous coarse-loamy till

Appendix D

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 1	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (0-5)

Photo No. 2	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (0-5)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 3	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (0-5)

Photo No. 4	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (0-5)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 5	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (10-15)

Photo No. 6	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (10-15)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 7	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (10-15)

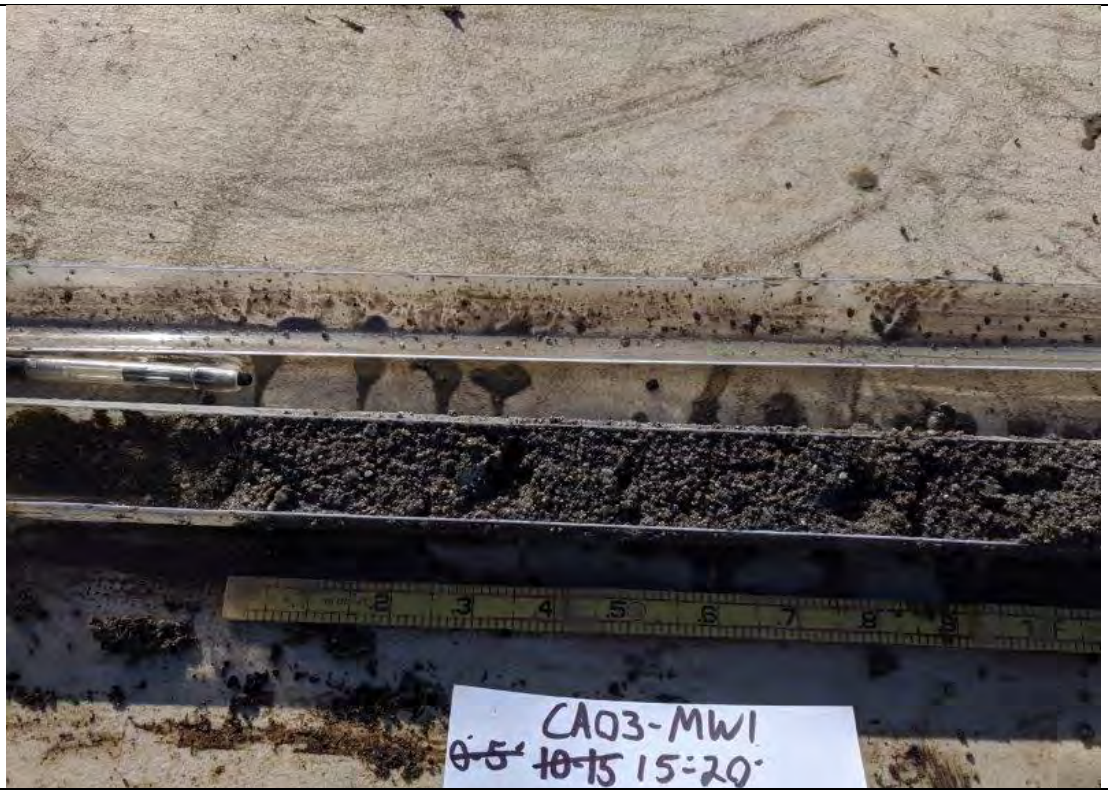
Photo No. 8	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (15-20)



AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 9	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (15-20)

Photo No. 10	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (15-20)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 11	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (20-25)

Photo No. 12	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (20-25)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 13	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (20-25)

Photo No. 14	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (20-25)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 15	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (25-30)

Photo No. 16	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (25-30)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 17	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (30-35)

Photo No. 18	Date: 01/06/20

Direction Photo Taken:

NA

Description:

CA03-MW1 (30-35)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 19	Date: 01/06/20
Direction Photo Taken: NA	
Description: CA03-MW1 (30-35)	

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 1	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (0-5)

Photo No. 2	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (0-5)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 3	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (0-5)

Photo No. 4	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (5-10)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 5	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (5-10)

Photo No. 6	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (10-15)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 7	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (10-15)

Photo No. 8	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (10-15)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 9	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (15-20)

Photo No. 10	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (15-20)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 11	Date: 12/19/19
Direction Photo Taken: NA	
Description: CA04-MW1 (15-20)	

Photo No. 12	Date: 12/19/19
Direction Photo Taken: NA	
Description: CA04-MW1 (20-25)	

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 13	Date: 12/19/19
Direction Photo Taken: NA	
Description: CA04-MW1 (20-25)	

Photo No. 14	Date: 12/19/19
Direction Photo Taken: NA	
Description: CA04-MW1 (20-25)	

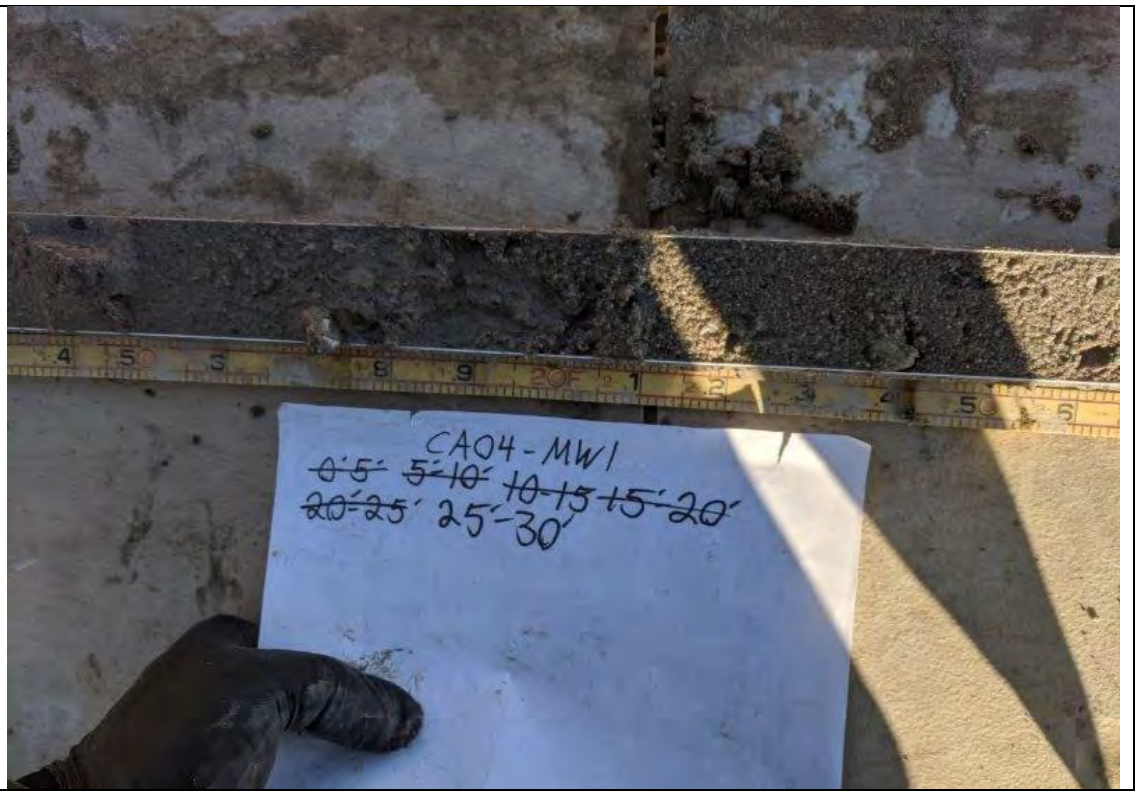
AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 15	Date: 12/19/19
Direction Photo Taken: NA	
Description: CA04-MW1 (25-30)	

Photo No. 16	Date: 12/19/19
Direction Photo Taken: NA	
Description: CA04-MW1 (25-30)	



AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 17	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (25-30)

Photo No. 18	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (30-35)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 19	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (30-35)

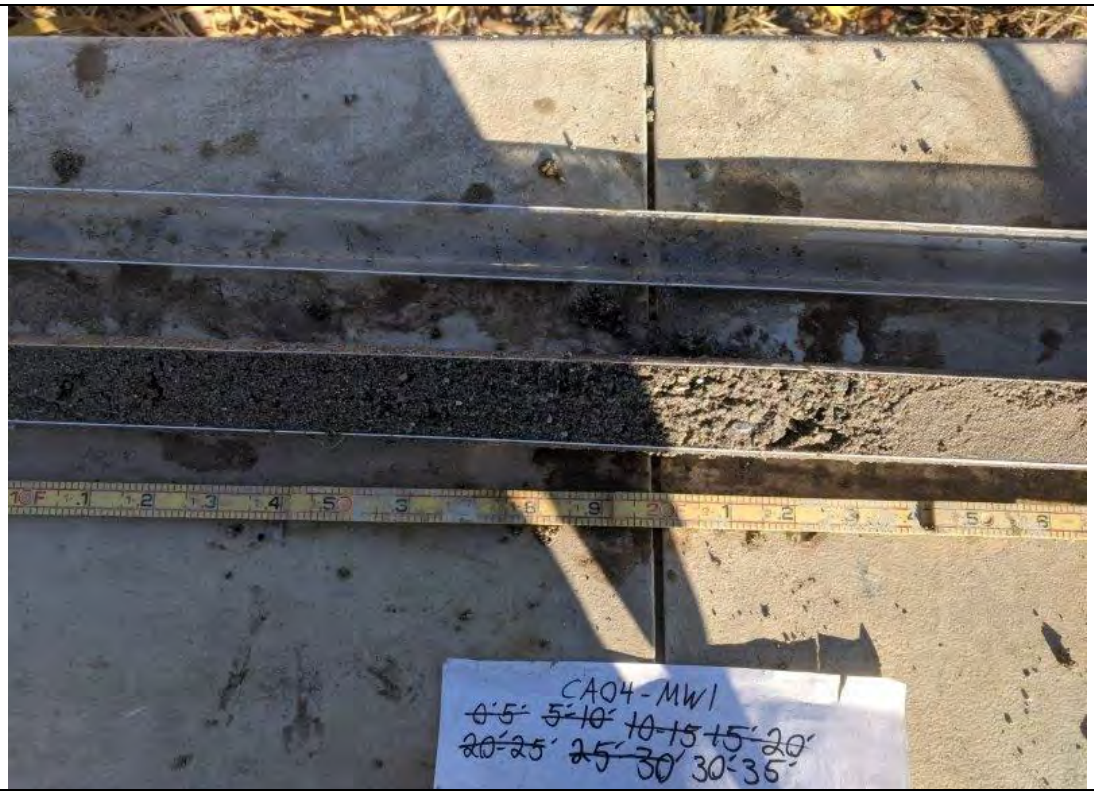


Photo No. 20	Date: 12/19/19

Direction Photo Taken:

NA

Description:

CA04-MW1 (30-35)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 21	Date: 12/19/19

Direction Photo Taken:

N/A

Description:

CA04-MW1 (30-35)

Photo No. 22	Date: 12/19/19

Direction Photo Taken:

N/A

Description:

CA04-MW1 (35-40)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 23	Date: 12/19/19

Direction Photo Taken:

N/A

Description:

CA04-MW1 (35-40)

Photo No. 24	Date: 12/19/19

Direction Photo Taken:

N/A

Description:

CA04-MW1 (35-40)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 25	Date: 12/19/19
Direction Photo Taken: N/A	
Description: CA04-MW1 (35-40)	

Photo No. 26	Date: 12/19/19
Direction Photo Taken: N/A	
Description: CA04-MW1 (40-45)	

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 27	Date: 12/19/19

Direction Photo Taken:

N/A

Description:

CA04-MW1 (40-45)

Photo No. 28	Date: 12/19/19

Direction Photo Taken:

N/A

Description:

CA04-MW1 (40-45)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 29	Date: 12/19/19
Direction Photo Taken: N/A	
Description: CA04-MW1 (40-45)	

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 1	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (5-10)

Photo No. 2	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (5-10)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 3	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (5-10)

Photo No. 4	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (5-10)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 5	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (10-15)

Photo No. 6	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (10-15)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 7	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (10-15)

Photo No. 8	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (15-20)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 9	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (15-20)

Photo No. 10	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (15-20)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 11	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (15-20)

Photo No. 12	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (20-25)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 13	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (20-25)

Photo No. 14	Date: 01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (20-25)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No.	Date:
15	01/03/20

Direction Photo Taken:

NA

Description:

CA05-MW1 (20-25)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 1	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (0-5)

Photo No. 2	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (0-5)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 3	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (0-5)

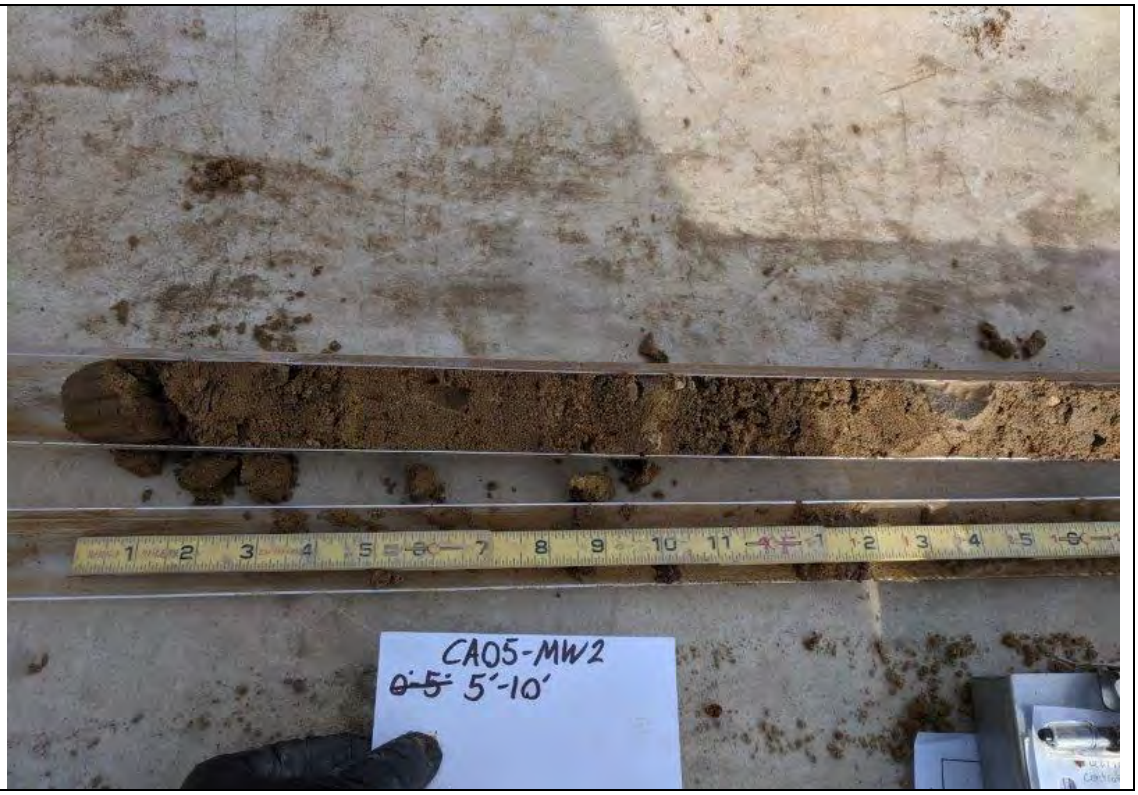
Photo No. 4	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (5-10)



AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 5	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (5-10)

Photo No. 6	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (5-10)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 7	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (5-10)

Photo No. 8	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (10-15)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 9	Date: 12/20/19
Direction Photo Taken: NA	
Description: CA05-MW2 (10-15)	

Photo No. 10	Date: 12/20/19
Direction Photo Taken: NA	
Description: CA05-MW2 (10-15)	

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 11	Date: 12/20/19
Direction Photo Taken: NA	
Description: CA05-MW2 (10-15)	

Photo No. 12	Date: 12/20/19
Direction Photo Taken: NA	
Description: CA05-MW2 (15-20)	

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 13	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (15-20)

Photo No. 14	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (15-20)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 15	Date: 12/20/19
Direction Photo Taken: NA	
Description: CA05-MW2 (20-25)	

Photo No. 16	Date: 12/20/19
Direction Photo Taken: NA	
Description: CA05-MW2 (20-25)	

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 17	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (20-25)

Photo No. 18	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (20-25)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 19	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (25-30)

Photo No. 20	Date: 12/20/19

Direction Photo Taken:

NA

Description:

CA05-MW2 (25-30)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 21	Date: 12/20/19

Direction Photo Taken:

N/A

Description:

CA05-MW2 (25-30)

Photo No. 22	Date: 12/20/19

Direction Photo Taken:

N/A

Description:

CA05-MW2 (30-35)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 23	Date: 12/20/19

Direction Photo Taken:

N/A

Description:

CA05-MW2 (30-35)

Photo No. 24	Date: 12/20/19

Direction Photo Taken:

N/A

Description:

CA05-MW2 (30-35)

AECOM

PHOTOGRAPH LOG

Project Name:	Site Location:		Project No.
Statewide WWTP Biosolids PFAS Evaluation	Bronson, MI		60588767

Photo No. 25	Date: 12/20/19

Direction Photo Taken:

N/A

Description:

CA05-MW2 (40-45)

Photo No. 26	Date: 12/20/19

Direction Photo Taken:

N/A

Description:

CA05-MW2 (40-45)

Appendix E

January 30, 2020

Vista Work Order No. 2000118

Ms. Maya Murshak
Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Dear Ms. Murshak,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on January 21, 2020 under your Project Name 'Statewide WWTP Biosolids PFAS Evaluation'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Work Order No. 2000118A
Case Narrative

Sample Condition on Receipt:

Eighteen aqueous samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology. As directed, the results for nine samples have been issued in a separate report.

Analytical Notes:

PFAS Isotope Dilution Method

The following samples contained particulate and were centrifuged prior to extraction:

Laboratory ID	Sample Name
2000118-02	GW2001131155RAP
2000118-05	GW2001131435RAP
2000118-07	GW2001131620RAP
2000118-08	GW2001141055RAP
2000118-09	GW2001141210RAP

The samples were extracted and analyzed for a selected list of PFAS using the PFAS Isotope Dilution Method (Modified EPA Method 537). The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries outside the acceptance criteria are flagged with an "H" qualifier.

TABLE OF CONTENTS

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2000118-01	GW2001131025RAP	13-Jan-20 10:25	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-02	GW2001131155RAP	13-Jan-20 11:55	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-03	GW2001131320RAP	13-Jan-20 13:20	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-04	GW2001131320RAP-FD	13-Jan-20 13:20	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-05	GW2001131435RAP	13-Jan-20 14:35	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-06	GW2001131535RAP	13-Jan-20 15:35	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-07	GW2001131620RAP	13-Jan-20 16:20	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-08	GW2001141055RAP	14-Jan-20 10:55	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-09	GW2001141210RAP	14-Jan-20 12:10	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-10	GW2001141450RAP	14-Jan-20 14:50	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-11	GW2001141525RAP	14-Jan-20 15:25	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-12	GW2001161030RAP	16-Jan-20 10:30	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-13	GW2001161140RAP	16-Jan-20 11:40	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-14	GW2001161305RAP	16-Jan-20 13:05	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-15	GW2001161400RAP	16-Jan-20 14:00	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-16	GW2001161500RAP	16-Jan-20 15:00	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-17	GW2001161500RAP-FD	16-Jan-20 15:00	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000118-18	GW2001161615RAP	16-Jan-20 16:15	21-Jan-20 09:42	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 2000118

Client Project: Statewide WWTP Biosolids PFAS Evaluation

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous

Project: Statewide WWTP Biosolids PFAS Evaluation

Laboratory Data

Lab Sample: B0A0148-BLK1 Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFPeA	2706-90-3	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFBS	375-73-5	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
4:2 FTS	757124-72-4	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFHxA	307-24-4	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFPeS	2706-91-4	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFHpA	375-85-9	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFHxS	355-46-4	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
6:2 FTS	27619-97-2	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFOA	335-67-1	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFHpS	375-92-8	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFNA	375-95-1	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFOSA	754-91-6	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFOS	1763-23-1	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFDA	335-76-2	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
8:2 FTS	39108-34-4	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFNS	68259-12-1	ND	1.94	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
MeFOSAA	2355-31-9	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
EtFOSAA	2991-50-6	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFUnA	2058-94-8	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFDS	335-77-3	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFDoA	307-55-1	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFTrDA	72629-94-8	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
PFTeDA	376-06-7	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	89.7	60 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C3-PFPeA	IS	86.0	60 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C3-PFBS	IS	111	60 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C2-4:2 FTS	IS	95.1	20 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C2-PFHxA	IS	90.8	70 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C4-PFHpA	IS	94.6	60 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C3-PFHxS	IS	108	60 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C2-6:2 FTS	IS	91.7	40 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C5-PFNA	IS	86.5	50 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C8-PFOSA	IS	20.4	20 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C2-PFOA	IS	86.5	60 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C8-PFOS	IS	85.0	60 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C2-PFDA	IS	89.5	60 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1

Sample ID: Method Blank **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous

Project: Statewide WWTP Biosolids PFAS Evaluation

Laboratory Data

Lab Sample: B0A0148-BLK1 Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	83.8	40 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
d3-MeFOSAA	IS	75.9	50 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C2-PFUnA	IS	71.4	60 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
d5-EtFOSAA	IS	73.8	50 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C2-PFDoA	IS	77.0	30 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1
13C2-PFTeDA	IS	76.6	20 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:27	1

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Aqueous

Laboratory Data

Lab Sample: B0A0148-BS1
Column: BEH C18

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	43.2	40.0	108	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFPeA	2706-90-3	44.6	40.0	112	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFBS	375-73-5	44.6	40.0	111	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
4:2 FTS	757124-72-4	44.6	40.0	111	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFHxA	307-24-4	45.6	40.0	114	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFPeS	2706-91-4	45.9	40.0	115	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFHpA	375-85-9	43.5	40.0	109	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFHxS	355-46-4	45.4	40.0	113	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
6:2 FTS	27619-97-2	38.2	40.0	95.5	60 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFOA	335-67-1	43.4	40.0	108	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFHpS	375-92-8	44.9	40.0	112	60 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFNA	375-95-1	45.1	40.0	113	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFOSA	754-91-6	43.1	40.0	108	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFOS	1763-23-1	38.7	40.0	96.6	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFDA	335-76-2	42.3	40.0	106	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
8:2 FTS	39108-34-4	44.4	40.0	111	60 - 130	Q	B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFNS	68259-12-1	36.3	40.0	90.7	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
MeFOSAA	2355-31-9	48.9	40.0	122	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
EtFOSAA	2991-50-6	45.0	40.0	113	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFUnA	2058-94-8	41.3	40.0	103	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFDS	335-77-3	36.7	40.0	91.8	60 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFDoA	307-55-1	44.7	40.0	112	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFTrDA	72629-94-8	47.6	40.0	119	60 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
PFTeDA	376-06-7	45.0	40.0	112	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.3	60- 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C3-PFPeA	IS	90.4	60- 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C3-PFBS	IS	93.6	60- 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C2-4:2 FTS	IS	83.8	20- 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C2-PFHxA	IS	89.6	70- 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C4-PFHpA	IS	95.0	60- 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C3-PFHxS	IS	93.5	60- 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C2-6:2 FTS	IS	88.0	40- 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C5-PFNA	IS	92.2	50- 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C8-PFOSA	IS	18.6	20- 150	H	B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Aqueous

Laboratory Data

Lab Sample: B0A0148-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFOA	IS	92.3	60- 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C8-PFOS	IS	94.3	60- 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C2-PFDA	IS	91.3	60- 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C2-8:2 FTS	IS	84.9	40- 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
d3-MeFOSAA	IS	63.5	50- 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C2-PFUnA	IS	78.2	60- 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
d5-EtFOSAA	IS	67.4	50- 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C2-PFDoA	IS	68.8	30- 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1
13C2-PFTeDA	IS	76.6	20- 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 18:07	1

Sample ID: GW2001131025RAP — **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT01-MW1S
Matrix: Aqueous
Date Collected: 13-Jan-20 10:25

Laboratory Data

Lab Sample: 2000118-01
Date Received: 21-Jan-20 09:42
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	1.88	1.35	1.98	3.95	J	B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFPeA	2706-90-3	1.94	1.35	1.98	3.95	J	B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFBS	375-73-5	9.82	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
4:2 FTS	757124-72-4	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFHxA	307-24-4	1.89	1.35	1.98	3.95	J	B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFPeS	2706-91-4	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFHpA	375-85-9	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFHxS	355-46-4	1.36	1.35	1.98	3.95	J	B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
6:2 FTS	27619-97-2	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFOA	335-67-1	3.00	1.35	1.98	3.95	J	B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFHpS	375-92-8	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFNA	375-95-1	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFOSA	754-91-6	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFOS	1763-23-1	1.50	1.35	1.98	3.95	J, Q	B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFDA	335-76-2	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
8:2 FTS	39108-34-4	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFNS	68259-12-1	ND	1.91	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
MeFOSAA	2355-31-9	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
EtFOSAA	2991-50-6	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFUnA	2058-94-8	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFDS	335-77-3	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFDoA	307-55-1	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFTrDA	72629-94-8	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
PFTeDA	376-06-7	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	91.0	60 - 130		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C3-PFPeA	IS	90.6	60 - 150		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C3-PFBS	IS	104	60 - 150		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C2-4:2 FTS	IS	102	20 - 150		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C2-PFHxA	IS	90.4	70 - 130		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C4-PFHpA	IS	93.3	60 - 150		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C3-PFHxS	IS	103	60 - 130		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C2-6:2 FTS	IS	89.5	40 - 150		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C5-PFNA	IS	91.1	50 - 130		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C8-PFOSA	IS	68.6	20 - 150		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C2-PFOA	IS	88.0	60 - 130		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C8-PFOS	IS	85.1	60 - 130		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C2-PFDA	IS	99.5	60 - 130		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1

Sample ID: GW2001131025RAP

PFAS Isotope Dilution Method

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Aqueous
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	13-Jan-20 10:25
Location:	DELH-DT01-MW1S		

Laboratory Data

Lab Sample:	2000118-01	Column:	BEH C18
Date Received:	21-Jan-20 09:42		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	85.5	40 - 150		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
d3-MeFOSAA	IS	97.0	50 - 150		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C2-PFUnA	IS	88.3	60 - 130		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
d5-EtFOSAA	IS	87.6	50 - 150		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C2-PFDoA	IS	81.7	30 - 130		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1
13C2-PFTeDA	IS	75.4	20 - 150		B0A0148	23-Jan-20	0.253 L	27-Jan-20 23:48	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: GW2001131155RAP

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT01-MW1D
Matrix: Aqueous
Date Collected: 13-Jan-20 11:55

Laboratory Data

Lab Sample: 2000118-02
Date Received: 21-Jan-20 09:42
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFPeA	2706-90-3	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFBS	375-73-5	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
4:2 FTS	757124-72-4	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFHxA	307-24-4	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFPeS	2706-91-4	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFHpA	375-85-9	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFHxS	355-46-4	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
6:2 FTS	27619-97-2	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFOA	335-67-1	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFHpS	375-92-8	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFNA	375-95-1	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFOSA	754-91-6	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFOS	1763-23-1	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFDA	335-76-2	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
8:2 FTS	39108-34-4	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFNS	68259-12-1	ND	1.93	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
MeFOSAA	2355-31-9	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
EtFOSAA	2991-50-6	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFUnA	2058-94-8	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFDS	335-77-3	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFDoA	307-55-1	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFTrDA	72629-94-8	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
PFTeDA	376-06-7	ND	1.37	2.00	3.99		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	73.1	60 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C3-PFPeA	IS	94.0	60 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C3-PFBS	IS	87.7	60 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C2-4:2 FTS	IS	80.3	20 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C2-PFHxA	IS	92.5	70 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C4-PFHpA	IS	97.4	60 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C3-PFHxS	IS	93.5	60 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C2-6:2 FTS	IS	94.6	40 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C5-PFNA	IS	91.3	50 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C8-PFOSA	IS	71.2	20 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C2-PFOA	IS	93.5	60 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C8-PFOS	IS	96.5	60 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C2-PFDA	IS	81.3	60 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1

Sample ID: GW2001131155RAP

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT01-MW1D
Matrix: Aqueous
Date Collected: 13-Jan-20 11:55

Laboratory Data

Lab Sample: 2000118-02
Date Received: 21-Jan-20 09:42
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	84.0	40 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
d3-MeFOSAA	IS	82.7	50 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C2-PFUnA	IS	83.4	60 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
d5-EtFOSAA	IS	95.9	50 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C2-PFDoA	IS	65.9	30 - 130		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1
13C2-PFTeDA	IS	75.1	20 - 150		B0A0148	23-Jan-20	0.250 L	27-Jan-20 23:58	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: GW2001131320RAP

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT01-MW2S
Matrix: Aqueous
Date Collected: 13-Jan-20 13:20

Laboratory Data

Lab Sample: 2000118-03
Date Received: 21-Jan-20 09:42
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	6.81	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFPeA	2706-90-3	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFBS	375-73-5	13.4	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
4:2 FTS	757124-72-4	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFHxA	307-24-4	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFPeS	2706-91-4	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFHpA	375-85-9	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFHxS	355-46-4	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
6:2 FTS	27619-97-2	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFOA	335-67-1	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFHpS	375-92-8	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFNA	375-95-1	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFOSA	754-91-6	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFOS	1763-23-1	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFDA	335-76-2	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
8:2 FTS	39108-34-4	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFNS	68259-12-1	ND	1.96	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
MeFOSAA	2355-31-9	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
EtFOSAA	2991-50-6	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFUnA	2058-94-8	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFDS	335-77-3	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFDoA	307-55-1	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFTrDA	72629-94-8	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
PFTeDA	376-06-7	ND	1.39	2.03	4.06		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	83.6	60 - 130		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C3-PFPeA	IS	86.6	60 - 150		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C3-PFBS	IS	92.4	60 - 150		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C2-4:2 FTS	IS	87.0	20 - 150		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C2-PFHxA	IS	92.8	70 - 130		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C4-PFHpA	IS	93.7	60 - 150		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C3-PFHxS	IS	89.0	60 - 130		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C2-6:2 FTS	IS	80.0	40 - 150		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C5-PFNA	IS	83.9	50 - 130		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C8-PFOSA	IS	57.1	20 - 150		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C2-PFOA	IS	90.1	60 - 130		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C8-PFOS	IS	88.0	60 - 130		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C2-PFDA	IS	86.9	60 - 130		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1

Sample ID: GW2001131320RAP

PFAS Isotope Dilution Method

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Aqueous
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	13-Jan-20 13:20
Location:	DELH-DT01-MW2S		

Laboratory Data

Lab Sample:	2000118-03	Column:	BEH C18
Date Received:	21-Jan-20 09:42		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	76.6	40 - 150		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
d3-MeFOSAA	IS	82.1	50 - 150		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C2-PFUnA	IS	76.5	60 - 130		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
d5-EtFOSAA	IS	86.1	50 - 150		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C2-PFDoA	IS	65.8	30 - 130		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1
13C2-PFTeDA	IS	75.1	20 - 150		B0A0148	23-Jan-20	0.246 L	28-Jan-20 00:09	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: GW2001131320RAP-FD

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT01-MW2S
Matrix: Aqueous
Date Collected: 13-Jan-20 13:20

Laboratory Data

Lab Sample: 2000118-04
Date Received: 21-Jan-20 09:42
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	6.60	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFPeA	2706-90-3	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFBS	375-73-5	13.8	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
4:2 FTS	757124-72-4	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFHxA	307-24-4	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFPeS	2706-91-4	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFHpA	375-85-9	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFHxS	355-46-4	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
6:2 FTS	27619-97-2	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFOA	335-67-1	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFHpS	375-92-8	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFNA	375-95-1	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFOSA	754-91-6	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFOS	1763-23-1	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFDA	335-76-2	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
8:2 FTS	39108-34-4	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFNS	68259-12-1	ND	1.92	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
MeFOSAA	2355-31-9	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
EtFOSAA	2991-50-6	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFUnA	2058-94-8	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFDS	335-77-3	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFDoA	307-55-1	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFTrDA	72629-94-8	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
PFTeDA	376-06-7	ND	1.36	1.99	3.98		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	81.4	60 - 130		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C3-PFPeA	IS	92.8	60 - 150		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C3-PFBS	IS	96.7	60 - 150		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C2-4:2 FTS	IS	97.7	20 - 150		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C2-PFHxA	IS	93.1	70 - 130		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C4-PFHpA	IS	93.4	60 - 150		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C3-PFHxS	IS	91.1	60 - 130		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C2-6:2 FTS	IS	110	40 - 150		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C5-PFNA	IS	86.0	50 - 130		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C8-PFOSA	IS	66.6	20 - 150		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C2-PFOA	IS	92.7	60 - 130		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C8-PFOS	IS	107	60 - 130		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C2-PFDA	IS	91.3	60 - 130		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1

Sample ID: GW2001131320RAP-FD

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT01-MW2S
Matrix: Aqueous
Date Collected: 13-Jan-20 13:20

Laboratory Data

Lab Sample: 2000118-04
Date Received: 21-Jan-20 09:42
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	95.1	40 - 150		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
d3-MeFOSAA	IS	88.7	50 - 150		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C2-PFUnA	IS	83.6	60 - 130		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
d5-EtFOSAA	IS	95.0	50 - 150		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C2-PFDoA	IS	68.6	30 - 130		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1
13C2-PFTeDA	IS	68.2	20 - 150		B0A0148	23-Jan-20	0.251 L	28-Jan-20 00:19	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: GW2001131435RAP

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT01-MW2D
Matrix: Aqueous
Date Collected: 13-Jan-20 14:35

Laboratory Data

Lab Sample: 2000118-05
Date Received: 21-Jan-20 09:42
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFPeA	2706-90-3	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFBS	375-73-5	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
4:2 FTS	757124-72-4	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFHxA	307-24-4	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFPeS	2706-91-4	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFHpA	375-85-9	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFHxS	355-46-4	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
6:2 FTS	27619-97-2	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFOA	335-67-1	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFHpS	375-92-8	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFNA	375-95-1	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFOSA	754-91-6	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFOS	1763-23-1	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFDA	335-76-2	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
8:2 FTS	39108-34-4	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFNS	68259-12-1	ND	1.96	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
MeFOSAA	2355-31-9	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
EtFOSAA	2991-50-6	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFUnA	2058-94-8	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFDS	335-77-3	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFDoA	307-55-1	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFTrDA	72629-94-8	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
PFTeDA	376-06-7	ND	1.38	2.02	4.04		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	67.4	60 - 130		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C3-PFPeA	IS	94.5	60 - 150		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C3-PFBS	IS	87.9	60 - 150		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C2-4:2 FTS	IS	86.5	20 - 150		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C2-PFHxA	IS	92.0	70 - 130		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C4-PFHpA	IS	93.3	60 - 150		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C3-PFHxS	IS	85.5	60 - 130		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C2-6:2 FTS	IS	83.0	40 - 150		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C5-PFNA	IS	90.3	50 - 130		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C8-PFOSA	IS	61.7	20 - 150		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C2-PFOA	IS	91.9	60 - 130		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C8-PFOS	IS	90.2	60 - 130		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C2-PFDA	IS	86.2	60 - 130		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1

Sample ID: GW2001131435RAP

PFAS Isotope Dilution Method

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Aqueous
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	13-Jan-20 14:35
Location:	DELH-DT01-MW2D		

Laboratory Data

Lab Sample:	2000118-05	Column:	BEH C18
Date Received:	21-Jan-20 09:42		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	95.7	40 - 150		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
d3-MeFOSAA	IS	94.8	50 - 150		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C2-PFUnA	IS	82.3	60 - 130		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
d5-EtFOSAA	IS	91.0	50 - 150		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C2-PFDoA	IS	72.0	30 - 130		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1
13C2-PFTeDA	IS	77.7	20 - 150		B0A0148	23-Jan-20	0.247 L	28-Jan-20 00:30	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: GW2001131535RAP

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT02-MW2S
Matrix: Aqueous
Date Collected: 13-Jan-20 15:35

Laboratory Data

Lab Sample: 2000118-06
Date Received: 21-Jan-20 09:42
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFPeA	2706-90-3	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFBS	375-73-5	2.67	1.35	1.98	3.95	J	B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
4:2 FTS	757124-72-4	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFHxA	307-24-4	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFPeS	2706-91-4	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFHpA	375-85-9	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFHxS	355-46-4	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
6:2 FTS	27619-97-2	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFOA	335-67-1	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFHpS	375-92-8	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFNA	375-95-1	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFOSA	754-91-6	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFOS	1763-23-1	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFDA	335-76-2	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
8:2 FTS	39108-34-4	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFNS	68259-12-1	ND	1.91	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
MeFOSAA	2355-31-9	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
EtFOSAA	2991-50-6	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFUnA	2058-94-8	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFDS	335-77-3	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFDoA	307-55-1	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFTrDA	72629-94-8	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
PFTeDA	376-06-7	ND	1.35	1.98	3.95		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	85.7	60 - 130		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C3-PFPeA	IS	91.9	60 - 150		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C3-PFBS	IS	96.5	60 - 150		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C2-4:2 FTS	IS	85.0	20 - 150		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C2-PFHxA	IS	90.5	70 - 130		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C4-PFHpA	IS	94.3	60 - 150		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C3-PFHxS	IS	95.1	60 - 130		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C2-6:2 FTS	IS	90.5	40 - 150		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C5-PFNA	IS	83.7	50 - 130		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C8-PFOSA	IS	61.1	20 - 150		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C2-PFOA	IS	93.7	60 - 130		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C8-PFOS	IS	87.4	60 - 130		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C2-PFDA	IS	85.8	60 - 130		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1

Sample ID: GW2001131535RAP

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT02-MW2S
Matrix: Aqueous
Date Collected: 13-Jan-20 15:35

Laboratory Data

Lab Sample: 2000118-06
Date Received: 21-Jan-20 09:42
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	86.8	40 - 150		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
d3-MeFOSAA	IS	77.2	50 - 150		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C2-PFUnA	IS	80.6	60 - 130		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
d5-EtFOSAA	IS	82.0	50 - 150		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C2-PFDoA	IS	64.2	30 - 130		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1
13C2-PFTeDA	IS	71.4	20 - 150		B0A0148	23-Jan-20	0.253 L	28-Jan-20 00:40	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: GW2001131620RAP

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT02-MW2D
Matrix: Aqueous
Date Collected: 13-Jan-20 16:20

Laboratory Data

Lab Sample: 2000118-07
Date Received: 21-Jan-20 09:42
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	3.45	1.37	2.00	4.00	J	B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFPeA	2706-90-3	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFBS	375-73-5	4.27	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
4:2 FTS	757124-72-4	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFHxA	307-24-4	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFPeS	2706-91-4	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFHpA	375-85-9	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFHxS	355-46-4	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
6:2 FTS	27619-97-2	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFOA	335-67-1	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFHpS	375-92-8	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFNA	375-95-1	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFOSA	754-91-6	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFOS	1763-23-1	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFDA	335-76-2	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
8:2 FTS	39108-34-4	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFNS	68259-12-1	ND	1.94	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
MeFOSAA	2355-31-9	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
EtFOSAA	2991-50-6	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFUnA	2058-94-8	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFDS	335-77-3	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFDoA	307-55-1	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFTrDA	72629-94-8	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
PFTeDA	376-06-7	ND	1.37	2.00	4.00		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	70.1	60 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C3-PFPeA	IS	88.8	60 - 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C3-PFBS	IS	85.4	60 - 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C2-4:2 FTS	IS	95.3	20 - 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C2-PFHxA	IS	88.5	70 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C4-PFHpA	IS	88.4	60 - 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C3-PFHxS	IS	86.5	60 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C2-6:2 FTS	IS	80.1	40 - 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C5-PFNA	IS	88.1	50 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C8-PFOSA	IS	35.9	20 - 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C2-PFOA	IS	90.3	60 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C8-PFOS	IS	85.8	60 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C2-PFDA	IS	82.2	60 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1

Sample ID: GW2001131620RAP

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT02-MW2D
Matrix: Aqueous
Date Collected: 13-Jan-20 16:20

Laboratory Data

Lab Sample: 2000118-07
Date Received: 21-Jan-20 09:42
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	82.5	40 - 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
d3-MeFOSAA	IS	87.5	50 - 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C2-PFUnA	IS	77.6	60 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
d5-EtFOSAA	IS	84.8	50 - 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C2-PFDoA	IS	70.8	30 - 130		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1
13C2-PFTeDA	IS	79.1	20 - 150		B0A0148	23-Jan-20	0.250 L	28-Jan-20 00:51	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: GW2001141055RAP **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT02-MW1S
Matrix: Aqueous
Date Collected: 14-Jan-20 10:55

Laboratory Data

Lab Sample: 2000118-08
Date Received: 21-Jan-20 09:42
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	6.10	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFPeA	2706-90-3	7.67	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFBS	375-73-5	62.1	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
4:2 FTS	757124-72-4	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFHxA	307-24-4	11.6	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFPeS	2706-91-4	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFHpA	375-85-9	3.68	1.45	2.12	4.24	J, Q	B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFHxS	355-46-4	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
6:2 FTS	27619-97-2	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFOA	335-67-1	5.65	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFHpS	375-92-8	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFNA	375-95-1	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFOSA	754-91-6	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFOS	1763-23-1	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFDA	335-76-2	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
8:2 FTS	39108-34-4	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFNS	68259-12-1	ND	2.05	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
MeFOSAA	2355-31-9	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
EtFOSAA	2991-50-6	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFUnA	2058-94-8	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFDS	335-77-3	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFDoA	307-55-1	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFTrDA	72629-94-8	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
PFTeDA	376-06-7	ND	1.45	2.12	4.24		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	70.1	60 - 130		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C3-PFPeA	IS	98.3	60 - 150		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C3-PFBS	IS	81.7	60 - 150		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C2-4:2 FTS	IS	111	20 - 150		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C2-PFHxA	IS	91.5	70 - 130		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C4-PFHpA	IS	99.4	60 - 150		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C3-PFHxS	IS	96.9	60 - 130		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C2-6:2 FTS	IS	95.6	40 - 150		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C5-PFNA	IS	87.5	50 - 130		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C8-PFOSA	IS	44.9	20 - 150		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C2-PFOA	IS	89.5	60 - 130		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C8-PFOS	IS	88.0	60 - 130		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C2-PFDA	IS	92.0	60 - 130		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1

Sample ID: GW2001141055RAP

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT02-MW1S
Matrix: Aqueous
Date Collected: 14-Jan-20 10:55

Laboratory Data

Lab Sample: 2000118-08
Date Received: 21-Jan-20 09:42
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	89.7	40 - 150		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
d3-MeFOSAA	IS	88.0	50 - 150		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C2-PFUnA	IS	83.7	60 - 130		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
d5-EtFOSAA	IS	86.3	50 - 150		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C2-PFDoA	IS	72.2	30 - 130		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1
13C2-PFTeDA	IS	84.3	20 - 150		B0A0148	23-Jan-20	0.236 L	28-Jan-20 01:01	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: GW2001141210RAP

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT02-MW1D
Matrix: Aqueous
Date Collected: 14-Jan-20 12:10

Laboratory Data

Lab Sample: 2000118-09
Date Received: 21-Jan-20 09:42
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	2.22	1.34	1.96	3.93	J	B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFPeA	2706-90-3	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFBS	375-73-5	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
4:2 FTS	757124-72-4	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFHxA	307-24-4	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFPeS	2706-91-4	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFHpA	375-85-9	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFHxS	355-46-4	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
6:2 FTS	27619-97-2	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFOA	335-67-1	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFHpS	375-92-8	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFNA	375-95-1	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFOSA	754-91-6	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFOS	1763-23-1	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFDA	335-76-2	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
8:2 FTS	39108-34-4	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFNS	68259-12-1	ND	1.90	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
MeFOSAA	2355-31-9	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
EtFOSAA	2991-50-6	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFUnA	2058-94-8	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFDS	335-77-3	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFDoA	307-55-1	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFTrDA	72629-94-8	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
PFTeDA	376-06-7	ND	1.34	1.96	3.93		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	74.5	60 - 130		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C3-PFPeA	IS	94.3	60 - 150		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C3-PFBS	IS	86.1	60 - 150		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C2-4:2 FTS	IS	84.6	20 - 150		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C2-PFHxA	IS	91.1	70 - 130		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C4-PFHpA	IS	91.6	60 - 150		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C3-PFHxS	IS	91.4	60 - 130		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C2-6:2 FTS	IS	91.1	40 - 150		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C5-PFNA	IS	89.7	50 - 130		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C8-PFOSA	IS	63.3	20 - 150		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C2-PFOA	IS	87.0	60 - 130		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C8-PFOS	IS	90.1	60 - 130		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C2-PFDA	IS	84.1	60 - 130		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1

Sample ID: GW2001141210RAP

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: DELH-DT02-MW1D
Matrix: Aqueous
Date Collected: 14-Jan-20 12:10

Laboratory Data

Lab Sample: 2000118-09
Date Received: 21-Jan-20 09:42
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	83.6	40 - 150		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
d3-MeFOSAA	IS	81.7	50 - 150		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C2-PFUnA	IS	79.3	60 - 130		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
d5-EtFOSAA	IS	94.8	50 - 150		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C2-PFDoA	IS	63.4	30 - 130		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1
13C2-PFTeDA	IS	70.0	20 - 150		B0A0148	23-Jan-20	0.255 L	28-Jan-20 01:33	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
CRS	Cleanup Recovery Standard
D	Dilution
DL	Detection limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
IS	Internal Standard
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limit of Detection
LOQ	Limit of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
NA	Not applicable
ND	Not Detected
OPR	Ongoing Precision and Recovery sample
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
RL	Reporting Limit
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)
*	See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-23
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Massachusetts Department of Environmental Protection	N/A
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718-B
New Jersey Department of Environmental Protection	190001
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	016
Texas Commission on Environmental Quality	T104704189-19-10
Vermont Department of Health	VT-4042
Virginia Department of General Services	10272
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

Revised CoC - rec'd via client email on 01/29/20 (2)

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 2000118A Temp: °C
Storage ID: Storage Secured: Yes ☐ No ☐

Project ID: **Statewide WWTP Biosolids PFAS Evaluation** PO#: **60588767.01** Sampler: **Russell Platte** (name)

TAT (check one): Standard: [x] 21 days; Rush (surcharge may apply): [ ] 14 days [ ] 7 days Specify:

Invoice to:	Name	Company	Address	City	State	Ph#	Fax#
	Stephanie Kammer	**MDEQ**	**525 W. Allegan Street**	**Lansing**	**MI**	**517-897-1597**	**517-241-3571**

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment:

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	PFAS Isotope Dilution: List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	USEPA Method 537: PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
GW2001131025RAP	1/13/20	10:25	DELH-DT01-MW1S	2	P	AQ			X							
GW2001131155RAP	1/13/20	11:55	DELH-DT01-MW1D	2	P	AQ			X							
GW2001131320RAP	1/13/20	13:20	DELH-DT01-MW2S	2	P	AQ			X							
GW2001131320RAP-FD	1/13/20	13:20	DELH-DT01-MW2S	2	P	AQ			X							
GW2001131435RAP	1/13/20	14:35	DELH-DT01-MW2D	2	P	AQ			X							
GW2001131535RAP	1/13/20	15:35	DELH-DT02-MW2S	2	P	AQ			X							
GW2001131620RAP	1/13/20	16:20	DELH-DT02-MW2D	2	P	AQ			X							
GW2001141055RAP	1/14/20	10:55	DELH-DT02-MW1S	2	P	AQ			X							
GW2001141210RAP	1/14/20	12:10	DELH-DT02-MW1D	2	P	AQ			X							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street, Constitution Hall, 1st South West**
City: **Lansing** State: **MI** Zip: **30242**
Phone: **517-897-1597** Fax: **517-241-3571**
Email: dorin.bogdan@aecom.com

Container Types: P= HDPE, PJ= HDPE Jar
O = Other:

Bottle Preservation Type: T = Thiosulfate,
TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, BS=Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 2000118 Temp: 1.3 °C
Storage ID: R-13, WR-2 Storage Secured: Yes ☑ No ☐

Project ID: Statewide WWTP Biosolids PFAS Evaluation PO#: 60588767.01 Sampler: Russell Platte (name)

TAT (check one): Standard: x 21 days; Rush (surcharge may apply): ☐ 14 days ☐ 7 days Specify:

Invoice to: Name	Company	Address	City	State	Ph#	Fax#
Stephanie Kammer	MDEQ	525 W. Allegan Street	Lansing	MI	517-897-1597	517-241-3571

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Russell Platte Russell Platte	12/20/20	16:30	Ashveen Prakash APrakash	01/21/20	0942
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment:

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s): Quantity	Type	Matrix	PFAS Isotope Dilution: List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	USEPA Method 537: PFOA/ PFOS	UCMR3 PFAS List 6	PFAS List: 14	Comments
GW2001131025RAP	1/13/20	10:25	DT01-MW1S	2	P	AQ			X							
GW2001131155RAP	1/13/20	11:55	DT01-MW1D	2	P	AQ			X							
GW2001131320RAP	1/13/20	13:20	DT01-MW2S	2	P	AQ			X							
GW2001131320RAP-FD	1/13/20	13:20	DT01-MW2S	2	P	AQ			X							
GW2001131435RAP	1/13/20	14:35	DT01-MW2D	2	P	AQ			X							
GW2001131535RAP	1/13/20	15:35	DT02-MW2S	2	P	AQ			X							
GW2001131620RAP	1/13/20	16:20	DT02-MW2D	2	P	AQ			X							
GW2001141055RAP	1/14/20	10:55	DT02-MW1S	2	P	AQ			X							
GW2001141210RAP	1/14/20	12:10	DT02-MW1D	2	P	AQ			X							
GW2001141450RAP	1/14/20	14:50	CA03-MW1S	2	P	AQ			X							

Special Instructions/Comments: Send Results and Acknowledgements to the list provided

SEND DOCUMENTATION AND RESULTS TO:

Name: Stephanie Kammer
Company: MDEQ
Address: 525 W. Allegan Street, Constitution Hall, 1st South West
City: Lansing State: MI Zip: 30242
Phone: 517-897-1597 Fax: 517-241-3571
Email: dorin.bogdan@aecom.com

Container Types: P= HDPE, PJ= HDPE Jar, O = Other:

Bottle Preservation Type: T = Thiosulfate, TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, BS=Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 2000118 Temp: 1.3 °C
Storage ID: R-13, WR-2 Storage Secured: Yes ☑ No ☐

TAT (check one): Standard: [x] 21 days; Rush (surcharge may apply): [ ] 14 days [ ] 7 days Specify:

Project ID: **Statewide WWTP Biosolids PFAS Evaluation** PO#: **60588767.01** Sampler: **Russell Platte** (name)

Invoice to: Name	Company	Address	City	State	Ph#	Fax#
Stephanie Kammer	**MDEQ**	**525 W. Allegan Street**	**Lansing**	**MI**	**517-897-1597**	**517-241-3571**

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Russell Platte Russell Platte	12/20/20	16:30	Ashwini Rajkash Ashwini Rajkash	01/21/20	0942
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment:

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	PFAS Isotope Dilution List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	USEPA Method 537 PFOA/PFOS	UCMR3 PFAS List: 6	PFAS List: 14	Comments
GW2001141525RAP	1/14/20	15:25	CA03-MW1D	2	P	AQ			X							
GW2001161030RAP	1/16/20	10:30	CA04-MW1S	2	P	AQ			X							
GW2001161140RAP	1/16/20	11:40	CA04-MW1D	2	P	AQ			X							
GW2001161305RAP	1/16/20	13:05	CA05-MW1S	2	P	AQ			X							
GW2001161400RAP	1/16/20	14:00	CA05-MW1D	2	P	AQ			X							
GW2001161500RAP	1/16/20	15:00	CA05-MW2S	2	P	AQ			X							
GW2001161500RAP-FD	1/16/20	15:00	CA05-MW2S	2	P	AQ			X							
GW2001161615RAP	1/16/20	16:15	CA05-MW2D	2	P	AQ			X							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street, Constitution Hall, 1st South West**
City: **Lansing** State: **MI** Zip: **30242**
Phone: **517-897-1597** Fax: **517-241-3571**
Email: dorin.bogdan@aecom.com

Container Types: P= HDPE, PJ= HDPE Jar, O = Other:

Bottle Preservation Type: T = Thiosulfate, TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, BS=Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 2000118 **TAT** std

Samples Arrival:	**Date/Time** 01/21/20 0942		**Initials:** AP		**Location:** WR-2 **Shelf/Rack:** N/A		
Delivered By:	FedEx	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	Ice		Blue Ice		Dry Ice		None
Temp °C: 1.3 (uncorrected) **Temp °C:** 1.3 (corrected)			**Probe used: Y / N**		**Thermometer ID:** IR-4		

	YES	NO	NA
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Airbill Trk # 4894 6696 4716	✓		
Shipping Documentation Present?	✓		
Shipping Container: Vista / Client / Retain / Return / Dispose			
Chain of Custody / Sample Documentation Present?	✓		
Chain of Custody / Sample Documentation Complete?	✓		
Holding Time Acceptable?	✓		

Logged In:	**Date/Time** 01/21/20 1024	**Initials:** WWS	**Location:** R-13, WR-2 **Shelf/Rack:** B-2, E-4
COC Anomaly/Sample Acceptance Form completed?		✓	✓

Comments:

CoC/Label Reconciliation Report WO# 2000118

LabNumber	CoC Sample ID	SampleAlias	Sample Date/Time	Container	BaseMatrix	Sample Comments
2000118-01	A GW2001131025RAP	DT01-MW1S	13-Jan-20 10:25	HDPE Bottle, 250 mL	Aqueous	
2000118-01	B GW2001131025RAP	DT01-MW1S (A)	13-Jan-20 10:25	HDPE Bottle, 250 mL	Aqueous	
2000118-02	A GW2001131155RAP	DT01-MW1D	13-Jan-20 11:55	HDPE Bottle, 250 mL	Aqueous	
2000118-02	B GW2001131155RAP	DT01-MW1D	13-Jan-20 11:55	HDPE Bottle, 250 mL	Aqueous	
2000118-03	A GW2001131320RAP	DT01-MW2S	13-Jan-20 13:20	HDPE Bottle, 250 mL	Aqueous	
2000118-03	B GW2001131320RAP	DT01-MW2S	13-Jan-20 13:20	HDPE Bottle, 250 mL	Aqueous	
2000118-04	A GW2001131320RAP-FD	DT01-MW2S	13-Jan-20 13:20	HDPE Bottle, 250 mL	Aqueous	
2000118-04	B GW2001131320RAP-FD	DT01-MW2S	13-Jan-20 13:20	HDPE Bottle, 250 mL	Aqueous	
2000118-05	A GW2001131435RAP	DT01-MW2D	13-Jan-20 14:35	HDPE Bottle, 250 mL	Aqueous	
2000118-05	B GW2001131435RAP	DT01-MW2D	13-Jan-20 14:35	HDPE Bottle, 250 mL	Aqueous	
2000118-06	A GW2001131535RAP	DT02-MW2S	13-Jan-20 15:35	HDPE Bottle, 250 mL	Aqueous	
2000118-06	B GW2001131535RAP	DT02-MW2S	13-Jan-20 15:35	HDPE Bottle, 250 mL	Aqueous	
2000118-07	A GW2001131620RAP	DT02-MW2D	13-Jan-20 16:20	HDPE Bottle, 250 mL	Aqueous	
2000118-07	B GW2001131620RAP	DT02-MW2D	13-Jan-20 16:20	HDPE Bottle, 250 mL	Aqueous	
2000118-08	A GW2001141055RAP	DT02-MW1S	14-Jan-20 10:55	HDPE Bottle, 250 mL	Aqueous	
2000118-08	B GW2001141055RAP	DT02-MW1S	14-Jan-20 10:55	HDPE Bottle, 250 mL	Aqueous	
2000118-09	A GW2001141210RAP	DT02-MW1D	14-Jan-20 12:10	HDPE Bottle, 250 mL	Aqueous	
2000118-09	B GW2001141210RAP	DT02-MW1D	14-Jan-20 12:10	HDPE Bottle, 250 mL	Aqueous	
2000118-10	A GW2001141450RAP	CA03-MW1S	14-Jan-20 14:50	HDPE Bottle, 250 mL	Aqueous	
2000118-10	B GW2001141450RAP	CA03-MW1S	14-Jan-20 14:50	HDPE Bottle, 250 mL	Aqueous	
2000118-11	A GW2001141525RAP	CA03-MW1D	14-Jan-20 15:25	HDPE Bottle, 250 mL	Aqueous	
2000118-11	B GW2001141525RAP	CA03-MW1D	14-Jan-20 15:25	HDPE Bottle, 250 mL	Aqueous	
2000118-12	A GW2001161030RAP	CA04-MW1S	16-Jan-20 10:30	HDPE Bottle, 250 mL	Aqueous	
2000118-12	B GW2001161030RAP (B)	CA04-MW1S	16-Jan-20 10:30	HDPE Bottle, 250 mL	Aqueous	
2000118-13	A GW2001161140RAP	CA04-MW1D	16-Jan-20 11:40	HDPE Bottle, 250 mL	Aqueous	
2000118-13	B GW2001161140RAP	CA04-MW1D	16-Jan-20 11:40	HDPE Bottle, 250 mL	Aqueous	
2000118-14	A GW2001161305RAP	CA05-MW1S	16-Jan-20 13:05	HDPE Bottle, 250 mL	Aqueous	
2000118-14	B GW2001161305RAP	CA05-MW1S	16-Jan-20 13:05	HDPE Bottle, 250 mL	Aqueous	
2000118-15	A GW2001161400RAP	CA05-MW1D	16-Jan-20 14:00	HDPE Bottle, 250 mL	Aqueous	

2000118-15	B GW2001161400RAP	☑	CA05-MW1D	16-Jan-20 14:00	☑	HDPE Bottle, 250 mL	Aqueous
2000118-16	A GW2001161500RAP	☑	CA05-MW2S	16-Jan-20 15:00	☑	HDPE Bottle, 250 mL	Aqueous
2000118-16	B GW2001161500RAP	☑	CA05-MW2S	16-Jan-20 15:00	☑	HDPE Bottle, 250 mL	Aqueous
2000118-17	A GW2001161500RAP-FD	☑	CA05-MW2S	16-Jan-20 15:00	☑	HDPE Bottle, 250 mL	Aqueous
2000118-17	B GW2001161500RAP-FD	☑	CA05-MW2S	16-Jan-20 15:00	☑	HDPE Bottle, 250 mL	Aqueous
2000118-18	A GW2001161615RAP	☑	CA05-MW2D	16-Jan-20 16:15	☑	HDPE Bottle, 250 mL	Aqueous
2000118-18	B GW2001161615RAP	☑	CA05-MW2D	16-Jan-20 16:15	☑	HDPE Bottle, 250 mL	Aqueous

Checkmarks indicate that information on the COC reconciled with the sample label.
Any discrepancies are noted in the following columns.

	Yes	No	NA
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Adequate Sample Volume?	✓		
Container Type Appropriate for Analysis(es)	✓		
Preservation Documented: Na2S2O3 Trizma None Other			✓
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			✓

Comments: (A) Sample Alias: "DT01-MW1D"
(B) sample ID: "GW2001161030RAP"
Date and time reconcile. wus 01/21/20

Verifed by/Date: CM / 01/21/20

May 02, 2019

Vista Work Order No. 1900728

Ms. Maya Murshak
Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Dear Ms. Murshak,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on April 11, 2019 under your Project Name 'Statewide WWTP Biosolids PFAS Evaluation'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Work Order No. 1900728
Case Narrative

Sample Condition on Receipt:

Five solid samples and six aqueous samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

PFAS Isotope Dilution Method

The aqueous samples were extracted and analyzed for a selected list of PFAS using Vista's PFAS Isotope Dilution Method. This method is listed on Vista's NELAP certificate as Modified EPA Method 537. The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

All samples except "TD011904081735MK" contained particulate and were centrifuged prior to extraction.

Holding Times

The samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries for all QC and field samples were within the acceptance criteria.

VAL-PFAS Method

The solid samples were extracted and analyzed for a selected list of PFAS using VAL Method PFAS. The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The samples were extracted and analyzed within the hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries for all QC and field samples were within the acceptance criteria.

TABLE OF CONTENTS

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1900728-01	SXDU41904081450RL	08-Apr-19 14:50	11-Apr-19 09:35	HDPE Jar, 6 oz
1900728-02	SW031904081510RL	08-Apr-19 15:10	11-Apr-19 09:35	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1900728-03	SW021904081525RL	08-Apr-19 15:25	11-Apr-19 09:35	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1900728-04	SXDU11904081700RL	08-Apr-19 17:00	11-Apr-19 09:35	HDPE Jar, 6 oz
1900728-05	SW011904081700MK	08-Apr-19 17:00	11-Apr-19 09:35	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1900728-06	TD011904081735MK	08-Apr-19 17:35	11-Apr-19 09:35	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1900728-07	SXDU21904081755RL	08-Apr-19 17:55	11-Apr-19 09:35	HDPE Jar, 6 oz
1900728-08	SXDU11904081825RL	08-Apr-19 18:25	11-Apr-19 09:35	HDPE Jar, 6 oz
1900728-09	TD011904081845MK	08-Apr-19 18:45	11-Apr-19 09:35	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1900728-10	SXDU21904081910RL	08-Apr-19 19:10	11-Apr-19 09:35	HDPE Jar, 6 oz
1900728-11	SW011904081930MK	08-Apr-19 19:30	11-Apr-19 09:35	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 1900728

Client Project: Statewide WWTP Biosolids PFAS Evaluation

ANALYTICAL RESULTS

Sample ID: Method Blank

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc. Matrix: Solid

Project: Statewide WWTP Biosolids PFAS Evaluation

Laboratory Data

Lab Sample: B9D0148-BLK1 Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFPeA	2706-90-3	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFBS	375-73-5	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
4:2 FTS	757124-72-4	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFHxA	307-24-4	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFPeS	2706-91-4	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFHpA	375-85-9	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFHxS	355-46-4	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
6:2 FTS	27619-97-2	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFOA	335-67-1	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFHpS	375-92-8	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFNA	375-95-1	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFOSA	754-91-6	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFOS	1763-23-1	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFDA	335-76-2	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
8:2 FTS	39108-34-4	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFNS	68259-12-1	ND	1.43	1.50	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
MeFOSAA	2355-31-9	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
EtFOSAA	2991-50-6	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFUnA	2058-94-8	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFDS	335-77-3	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFDoA	307-55-1	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFTrDA	72629-94-8	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFTeDA	376-06-7	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.3	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C3-PFPeA	IS	87.5	60 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C3-PFBS	IS	97.6	60 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-4:2 FTS	IS	107	40 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-PFHxA	IS	89.5	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C4-PFHpA	IS	90.6	60 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C3-PFHxS	IS	97.6	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-6:2 FTS	IS	105	40 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-PFOA	IS	87.7	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C5-PFNA	IS	78.1	50 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C8-PFOSA	IS	42.1	20 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C8-PFOS	IS	87.3	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-PFDA	IS	78.1	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1

Sample ID: Method Blank

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Solid

Laboratory Data

Lab Sample: B9D0148-BLK1
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	93.2	40 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
d3-MeFOSAA	IS	72.2	50 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
d5-EtFOSAA	IS	68.4	50 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-PFUnA	IS	64.2	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-PFDoA	IS	52.0	30 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-PFTeDA	IS	51.3	20 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: OPR **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Solid

Laboratory Data

Lab Sample: B9D0148-BS1
Column: BEH C18

Analyte	CAS Number	Amt Found (ng/g)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	10.9	10.0	109	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFPeA	2706-90-3	10.8	10.0	108	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFBS	375-73-5	10.1	10.0	101	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
4:2 FTS	757124-72-4	10.2	10.0	102	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFHxA	307-24-4	11.1	10.0	111	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFPeS	2706-91-4	11.4	10.0	114	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFHpA	375-85-9	10.2	10.0	102	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFHxS	355-46-4	10.3	10.0	103	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
6:2 FTS	27619-97-2	9.56	10.0	95.6	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFOA	335-67-1	10.6	10.0	106	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFHpS	375-92-8	10.2	10.0	102	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFNA	375-95-1	10.0	10.0	100	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFOSA	754-91-6	10.4	10.0	104	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFOS	1763-23-1	10.1	10.0	101	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFDA	335-76-2	10.1	10.0	101	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
8:2 FTS	39108-34-4	11.2	10.0	112	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFNS	68259-12-1	9.09	10.0	90.9	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
MeFOSAA	2355-31-9	10.2	10.0	102	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
EtFOSAA	2991-50-6	11.3	10.0	113	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFUnA	2058-94-8	10.5	10.0	105	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFDS	335-77-3	8.16	10.0	81.6	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFDoA	307-55-1	11.6	10.0	116	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFTrDA	72629-94-8	11.2	10.0	112	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFTeDA	376-06-7	9.87	10.0	98.7	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	91.8	60- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C3-PFPeA	IS	90.2	60- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C3-PFBS	IS	89.4	60- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-4:2 FTS	IS	96.6	40- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-PFHxA	IS	91.6	70- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C4-PFHpA	IS	92.7	60- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C3-PFHxS	IS	90.2	60- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-6:2 FTS	IS	103	40- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-PFOA	IS	97.3	60- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C5-PFNA	IS	85.5	50- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1

Sample ID: OPR **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Solid

Laboratory Data

Lab Sample: B9D0148-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOSA	IS	45.7	20- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C8-PFOS	IS	96.4	60- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-PFDA	IS	79.7	60- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-8:2 FTS	IS	95.4	40- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
d3-MeFOSAA	IS	66.0	50- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
d5-EtFOSAA	IS	66.7	50- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-PFUnA	IS	69.6	60- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-PFDoA	IS	56.3	30- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-PFTeDA	IS	58.7	20- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1

Sample ID: SXDU41904081450RL

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W10-CA03
Matrix: Soil
Date Collected: 08-Apr-19 14:50

Laboratory Data

Lab Sample: 1900728-01
Date Received: 11-Apr-19 09:35
% Solids: 85.2
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFPeA	2706-90-3	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFBS	375-73-5	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
4:2 FTS	757124-72-4	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFHxA	307-24-4	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFPeS	2706-91-4	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFHpA	375-85-9	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFHxS	355-46-4	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
6:2 FTS	27619-97-2	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFOA	335-67-1	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFHpS	375-92-8	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFNA	375-95-1	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFOSA	754-91-6	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFOS	1763-23-1	0.891	0.827	0.978	1.96	J, Q	B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFDA	335-76-2	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
8:2 FTS	39108-34-4	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFNS	68259-12-1	ND	1.40	1.47	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
MeFOSAA	2355-31-9	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
EtFOSAA	2991-50-6	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFUnA	2058-94-8	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFDS	335-77-3	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFDoA	307-55-1	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFTrDA	72629-94-8	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
PFTeDA	376-06-7	ND	0.827	0.978	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.6	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C3-PFPeA	IS	93.2	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C3-PFBS	IS	95.9	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C2-4:2 FTS	IS	137	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C2-PFHxA	IS	93.5	70 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C4-PFHpA	IS	92.3	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C3-PFHxS	IS	99.8	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C2-6:2 FTS	IS	121	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C2-PFOA	IS	84.5	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C5-PFNA	IS	83.5	50 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C8-PFOSA	IS	68.9	20 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C8-PFOS	IS	86.9	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C2-PFDA	IS	82.8	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1

Sample ID: SXDU41904081450RL

VAL - PFAS

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 14:50
Location:	BRON-07S08W10-CA03		

Laboratory Data

Lab Sample:	1900728-01	Column:	BEH C18
Date Received:	11-Apr-19 09:35		
% Solids:	85.2		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	86.6	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
d3-MeFOSAA	IS	87.1	50 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
d5-EtFOSAA	IS	90.8	50 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C2-PFUnA	IS	87.8	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C2-PFDoA	IS	60.7	30 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1
13C2-PFTeDA	IS	31.3	20 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:12	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SXDU11904081700RL

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W11-CA05
Matrix: Soil
Date Collected: 08-Apr-19 17:00

Laboratory Data

Lab Sample: 1900728-04
Date Received: 11-Apr-19 09:35
% Solids: 85.3
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFPeA	2706-90-3	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFBS	375-73-5	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
4:2 FTS	757124-72-4	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFHxA	307-24-4	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFPeS	2706-91-4	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFHpA	375-85-9	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFHxS	355-46-4	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
6:2 FTS	27619-97-2	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFOA	335-67-1	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFHpS	375-92-8	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFNA	375-95-1	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFOSA	754-91-6	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFOS	1763-23-1	7.00	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFDA	335-76-2	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
8:2 FTS	39108-34-4	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFNS	68259-12-1	ND	1.40	1.46	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
MeFOSAA	2355-31-9	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
EtFOSAA	2991-50-6	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFUnA	2058-94-8	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFDS	335-77-3	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFDoA	307-55-1	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFTrDA	72629-94-8	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
PFTeDA	376-06-7	ND	0.825	0.976	1.95		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.0	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C3-PFPeA	IS	92.3	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C3-PFBS	IS	97.2	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C2-4:2 FTS	IS	136	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C2-PFHxA	IS	89.8	70 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C4-PFHpA	IS	90.0	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C3-PFHxS	IS	91.0	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C2-6:2 FTS	IS	110	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C2-PFOA	IS	90.5	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C5-PFNA	IS	82.2	50 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C8-PFOSA	IS	46.8	20 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C8-PFOS	IS	91.6	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C2-PFDA	IS	73.6	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1

Sample ID: SXDU11904081700RL

VAL - PFAS

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 17:00
Location:	BRON-07S08W11-CA05		

Laboratory Data

Lab Sample:	1900728-04	Column:	BEH C18
Date Received:	11-Apr-19 09:35		
% Solids:	85.3		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	113	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
d3-MeFOSAA	IS	88.9	50 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
d5-EtFOSAA	IS	89.8	50 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C2-PFUnA	IS	74.5	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C2-PFDoA	IS	65.9	30 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1
13C2-PFTeDA	IS	75.2	20 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:23	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SXDU21904081755RL

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W11-CA05
Matrix: Soil
Date Collected: 08-Apr-19 17:55

Laboratory Data

Lab Sample: 1900728-07
Date Received: 11-Apr-19 09:35
% Solids: 84.7
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFPeA	2706-90-3	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFBS	375-73-5	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
4:2 FTS	757124-72-4	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFHxA	307-24-4	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFPeS	2706-91-4	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFHpA	375-85-9	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFHxS	355-46-4	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
6:2 FTS	27619-97-2	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFOA	335-67-1	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFHpS	375-92-8	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFNA	375-95-1	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFOSA	754-91-6	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFOS	1763-23-1	6.28	0.831	0.984	1.97	Q	B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFDA	335-76-2	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
8:2 FTS	39108-34-4	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFNS	68259-12-1	ND	1.41	1.48	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
MeFOSAA	2355-31-9	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
EtFOSAA	2991-50-6	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFUnA	2058-94-8	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFDS	335-77-3	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFDoA	307-55-1	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFTrDA	72629-94-8	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
PFTeDA	376-06-7	ND	0.831	0.984	1.97		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.2	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C3-PFPeA	IS	90.9	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C3-PFBS	IS	85.9	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C2-4:2 FTS	IS	117	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C2-PFHxA	IS	91.2	70 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C4-PFHpA	IS	92.2	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C3-PFHxS	IS	85.7	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C2-6:2 FTS	IS	107	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C2-PFOA	IS	81.6	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C5-PFNA	IS	84.3	50 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C8-PFOSA	IS	43.1	20 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C8-PFOS	IS	84.3	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C2-PFDA	IS	79.1	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1

Sample ID: SXDU21904081755RL

VAL - PFAS

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 17:55
Location:	BRON-07S08W11-CA05		

Laboratory Data

Lab Sample:	1900728-07	Column:	BEH C18
Date Received:	11-Apr-19 09:35		
% Solids:	84.7		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	91.7	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
d3-MeFOSAA	IS	82.0	50 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
d5-EtFOSAA	IS	80.4	50 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C2-PFUnA	IS	76.2	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C2-PFDoA	IS	61.8	30 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1
13C2-PFTeDA	IS	53.7	20 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:34	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SXDU11904081825RL

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W11-CA04
Matrix: Soil
Date Collected: 08-Apr-19 18:25

Laboratory Data

Lab Sample: 1900728-08
Date Received: 11-Apr-19 09:35
% Solids: 85.1
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFPeA	2706-90-3	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFBS	375-73-5	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
4:2 FTS	757124-72-4	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFHxA	307-24-4	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFPeS	2706-91-4	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFHpA	375-85-9	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFHxS	355-46-4	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
6:2 FTS	27619-97-2	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFOA	335-67-1	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFHpS	375-92-8	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFNA	375-95-1	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFOSA	754-91-6	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFOS	1763-23-1	13.3	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFDA	335-76-2	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
8:2 FTS	39108-34-4	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFNS	68259-12-1	ND	1.40	1.47	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
MeFOSAA	2355-31-9	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
EtFOSAA	2991-50-6	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFUnA	2058-94-8	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFDS	335-77-3	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFDoA	307-55-1	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFTrDA	72629-94-8	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
PFTeDA	376-06-7	ND	0.828	0.979	1.96		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.4	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C3-PFPeA	IS	89.3	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C3-PFBS	IS	90.4	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C2-4:2 FTS	IS	123	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C2-PFHxA	IS	92.3	70 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C4-PFHpA	IS	95.3	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C3-PFHxS	IS	88.4	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C2-6:2 FTS	IS	130	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C2-PFOA	IS	87.9	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C5-PFNA	IS	85.9	50 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C8-PFOSA	IS	47.7	20 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C8-PFOS	IS	87.9	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C2-PFDA	IS	76.5	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1

Sample ID: SXDU11904081825RL

VAL - PFAS

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 18:25
Location:	BRON-07S08W11-CA04		

Laboratory Data

Lab Sample:	1900728-08	Column:	BEH C18
Date Received:	11-Apr-19 09:35		
% Solids:	85.1		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	118	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
d3-MeFOSAA	IS	79.8	50 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
d5-EtFOSAA	IS	77.7	50 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C2-PFUnA	IS	76.5	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C2-PFDoA	IS	63.0	30 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1
13C2-PFTeDA	IS	38.2	20 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:44	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SXDU21904081910RL

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W11-CA04
Matrix: Soil
Date Collected: 08-Apr-19 19:10

Laboratory Data

Lab Sample: 1900728-10
Date Received: 11-Apr-19 09:35
% Solids: 87.5
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFPeA	2706-90-3	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFBS	375-73-5	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
4:2 FTS	757124-72-4	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFHxA	307-24-4	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFPeS	2706-91-4	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFHpA	375-85-9	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFHxS	355-46-4	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
6:2 FTS	27619-97-2	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFOA	335-67-1	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFHpS	375-92-8	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFNA	375-95-1	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFOSA	754-91-6	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFOS	1763-23-1	3.92	0.840	0.994	1.99	Q	B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFDA	335-76-2	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
8:2 FTS	39108-34-4	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFNS	68259-12-1	ND	1.42	1.49	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
MeFOSAA	2355-31-9	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
EtFOSAA	2991-50-6	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFUnA	2058-94-8	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFDS	335-77-3	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFDoA	307-55-1	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFTrDA	72629-94-8	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
PFTeDA	376-06-7	ND	0.840	0.994	1.99		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.1	60 - 130		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C3-PFPeA	IS	92.9	60 - 150		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C3-PFBS	IS	87.4	60 - 150		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C2-4:2 FTS	IS	129	40 - 150		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C2-PFHxA	IS	86.6	70 - 130		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C4-PFHpA	IS	92.3	60 - 150		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C3-PFHxS	IS	85.4	60 - 130		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C2-6:2 FTS	IS	105	40 - 150		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C2-PFOA	IS	79.6	60 - 130		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C5-PFNA	IS	84.1	50 - 130		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C8-PFOSA	IS	43.1	20 - 150		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C8-PFOS	IS	95.2	60 - 130		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C2-PFDA	IS	67.4	60 - 130		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1

Sample ID: SXDU21904081910RL

VAL - PFAS

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 19:10
Location:	BRON-07S08W11-CA04		

Laboratory Data

Lab Sample:	1900728-10	Column:	BEH C18
Date Received:	11-Apr-19 09:35		
% Solids:	87.5		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	108	40 - 150		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
d3-MeFOSAA	IS	84.6	50 - 150		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
d5-EtFOSAA	IS	85.4	50 - 150		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C2-PFUnA	IS	77.8	60 - 130		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C2-PFDoA	IS	51.6	30 - 130		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1
13C2-PFTeDA	IS	32.0	20 - 150		B9D0148	25-Apr-19	1.15 g	30-Apr-19 02:55	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous

Project: Statewide WWTP Biosolids PFAS Evaluation

Laboratory Data

Lab Sample: B9D0139-BLK1 Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFPeA	2706-90-3	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFBS	375-73-5	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
4:2 FTS	757124-72-4	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFHxA	307-24-4	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFPeS	2706-91-4	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFHpA	375-85-9	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFHxS	355-46-4	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
6:2 FTS	27619-97-2	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFOA	335-67-1	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFHpS	375-92-8	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFNA	375-95-1	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFOSA	754-91-6	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFOS	1763-23-1	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFDA	335-76-2	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
8:2 FTS	39108-34-4	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFNS	68259-12-1	ND	1.94	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
MeFOSAA	2355-31-9	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
EtFOSAA	2991-50-6	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFUnA	2058-94-8	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFDS	335-77-3	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFDoA	307-55-1	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFTrDA	72629-94-8	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
PFTeDA	376-06-7	ND	1.37	2.00	4.00		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	97.1	60 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C3-PFPeA	IS	96.6	60 - 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C3-PFBS	IS	96.1	60 - 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C2-4:2 FTS	IS	104	20 - 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C2-PFHxA	IS	95.2	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C4-PFHpA	IS	93.6	60 - 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C3-PFHxS	IS	94.3	60 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C2-6:2 FTS	IS	100	40 - 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C2-PFOA	IS	79.6	60 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C5-PFNA	IS	69.2	50 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C8-PFOSA	IS	41.1	20 - 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C8-PFOS	IS	82.4	60 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C2-PFDA	IS	69.1	60 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1

Sample ID: Method Blank **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous

Project: Statewide WWTP Biosolids PFAS Evaluation

Laboratory Data

Lab Sample: B9D0139-BLK1 Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	86.4	40 - 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
d3-MeFOSAA	IS	62.3	50 - 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
d5-EtFOSAA	IS	65.8	50 - 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C2-PFUnA	IS	62.5	60 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C2-PFDoA	IS	63.9	30 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1
13C2-PFTeDA	IS	60.7	20 - 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:30	1

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Aqueous

Laboratory Data

Lab Sample: B9D0139-BS1
Column: BEH C18

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	38.6	40.0	96.5	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFPeA	2706-90-3	39.3	40.0	98.3	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFBS	375-73-5	38.8	40.0	97.1	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
4:2 FTS	757124-72-4	37.9	40.0	94.8	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFHxA	307-24-4	40.7	40.0	102	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFPeS	2706-91-4	36.3	40.0	90.6	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFHpA	375-85-9	37.2	40.0	93.1	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFHxS	355-46-4	37.8	40.0	94.5	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
6:2 FTS	27619-97-2	38.1	40.0	95.1	60 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFOA	335-67-1	38.6	40.0	96.6	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFHpS	375-92-8	41.6	40.0	104	60 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFNA	375-95-1	42.7	40.0	107	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFOSA	754-91-6	38.0	40.0	95.1	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFOS	1763-23-1	37.8	40.0	94.5	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFDA	335-76-2	39.7	40.0	99.2	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
8:2 FTS	39108-34-4	43.3	40.0	108	60 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFNS	68259-12-1	35.8	40.0	89.6	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
MeFOSAA	2355-31-9	37.3	40.0	93.2	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
EtFOSAA	2991-50-6	37.1	40.0	92.9	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFUnA	2058-94-8	42.1	40.0	105	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFDS	335-77-3	36.8	40.0	92.0	60 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFDoA	307-55-1	39.2	40.0	98.1	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFTrDA	72629-94-8	40.1	40.0	100	60 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
PFTeDA	376-06-7	40.2	40.0	100	70 - 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	98.8	60- 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C3-PFPeA	IS	95.3	60- 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C3-PFBS	IS	96.7	60- 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C2-4:2 FTS	IS	95.8	20- 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C2-PFHxA	IS	99.1	70- 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C4-PFHpA	IS	98.8	60- 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C3-PFHxS	IS	90.9	60- 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C2-6:2 FTS	IS	108	40- 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C2-PFOA	IS	85.8	60- 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C5-PFNA	IS	68.8	50- 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Aqueous

Laboratory Data

Lab Sample: B9D0139-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOSA	IS	41.6	20- 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C8-PFOS	IS	84.6	60- 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C2-PFDA	IS	74.6	60- 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C2-8:2 FTS	IS	85.0	40- 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
d3-MeFOSAA	IS	68.7	50- 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
d5-EtFOSAA	IS	68.0	50- 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C2-PFUnA	IS	67.4	60- 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C2-PFDoA	IS	70.4	30- 130		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1
13C2-PFTeDA	IS	58.1	20- 150		B9D0139	17-Apr-19	0.250 L	19-Apr-19 00:20	1

Sample ID: SW031904081510RL **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W10-CA03
Matrix: Aqueous
Date Collected: 08-Apr-19 15:10

Laboratory Data

Lab Sample: 1900728-02
Date Received: 11-Apr-19 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	3.38	1.43	2.09	4.18	J	B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFPeA	2706-90-3	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFBS	375-73-5	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
4:2 FTS	757124-72-4	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFHxA	307-24-4	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFPeS	2706-91-4	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFHpA	375-85-9	1.59	1.43	2.09	4.18	J	B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFHxS	355-46-4	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
6:2 FTS	27619-97-2	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFOA	335-67-1	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFHpS	375-92-8	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFNA	375-95-1	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFOSA	754-91-6	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFOS	1763-23-1	3.06	1.43	2.09	4.18	J	B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFDA	335-76-2	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
8:2 FTS	39108-34-4	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFNS	68259-12-1	ND	2.02	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
MeFOSAA	2355-31-9	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
EtFOSAA	2991-50-6	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFUnA	2058-94-8	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFDS	335-77-3	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFDoA	307-55-1	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFTrDA	72629-94-8	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
PFTeDA	376-06-7	ND	1.43	2.09	4.18		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	89.3	60 - 130		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C3-PFPeA	IS	87.9	60 - 150		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C3-PFBS	IS	90.5	60 - 150		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C2-4:2 FTS	IS	95.1	20 - 150		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C2-PFHxA	IS	90.2	70 - 130		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C4-PFHpA	IS	92.3	60 - 150		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C3-PFHxS	IS	90.9	60 - 130		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C2-6:2 FTS	IS	101	40 - 150		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C2-PFOA	IS	88.6	60 - 130		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C5-PFNA	IS	76.8	50 - 130		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C8-PFOSA	IS	54.0	20 - 150		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C8-PFOS	IS	92.6	60 - 130		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C2-PFDA	IS	74.1	60 - 130		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1

Sample ID: SW031904081510RL

PFAS Isotope Dilution Method

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Aqueous
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 15:10
Location:	BRON-07S08W10-CA03		

Laboratory Data

Lab Sample:	1900728-02	Column:	BEH C18
Date Received:	11-Apr-19 09:35		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	95.4	40 - 150		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
d3-MeFOSAA	IS	65.7	50 - 150		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
d5-EtFOSAA	IS	69.3	50 - 150		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C2-PFUnA	IS	67.4	60 - 130		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C2-PFDoA	IS	60.4	30 - 130		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1
13C2-PFTeDA	IS	48.6	20 - 150		B9D0139	17-Apr-19	0.239 L	19-Apr-19 02:27	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SW021904081525RL **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W10-CA03
Matrix: Aqueous
Date Collected: 08-Apr-19 15:25

Laboratory Data

Lab Sample: 1900728-03
Date Received: 11-Apr-19 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	3.73	1.54	2.25	4.50	J	B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFPeA	2706-90-3	1.66	1.54	2.25	4.50	J	B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFBS	375-73-5	3.07	1.54	2.25	4.50	J	B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
4:2 FTS	757124-72-4	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFHxA	307-24-4	1.56	1.54	2.25	4.50	J	B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFPeS	2706-91-4	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFHpA	375-85-9	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFHxS	355-46-4	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
6:2 FTS	27619-97-2	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFOA	335-67-1	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFHpS	375-92-8	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFNA	375-95-1	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFOSA	754-91-6	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFOS	1763-23-1	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFDA	335-76-2	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
8:2 FTS	39108-34-4	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFNS	68259-12-1	ND	2.18	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
MeFOSAA	2355-31-9	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
EtFOSAA	2991-50-6	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFUnA	2058-94-8	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFDS	335-77-3	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFDoA	307-55-1	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFTrDA	72629-94-8	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
PFTeDA	376-06-7	ND	1.54	2.25	4.50		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	92.7	60 - 130		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C3-PFPeA	IS	90.0	60 - 150		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C3-PFBS	IS	90.3	60 - 150		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C2-4:2 FTS	IS	91.3	20 - 150		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C2-PFHxA	IS	86.6	70 - 130		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C4-PFHpA	IS	87.5	60 - 150		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C3-PFHxS	IS	88.5	60 - 130		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C2-6:2 FTS	IS	93.4	40 - 150		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C2-PFOA	IS	84.5	60 - 130		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C5-PFNA	IS	90.0	50 - 130		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C8-PFOSA	IS	65.4	20 - 150		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C8-PFOS	IS	80.4	60 - 130		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C2-PFDA	IS	77.0	60 - 130		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1

Sample ID: SW021904081525RL **PFAS Isotope Dilution Method**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Aqueous
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 15:25
Location:	BRON-07S08W10-CA03		

Laboratory Data

Lab Sample:	1900728-03	Column:	BEH C18
Date Received:	11-Apr-19 09:35		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	96.3	40 - 150		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
d3-MeFOSAA	IS	69.1	50 - 150		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
d5-EtFOSAA	IS	73.8	50 - 150		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C2-PFUnA	IS	73.6	60 - 130		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C2-PFDoA	IS	68.7	30 - 130		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1
13C2-PFTeDA	IS	80.8	20 - 150		B9D0139	17-Apr-19	0.222 L	19-Apr-19 02:38	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SW011904081700MK **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W11-CA05
Matrix: Aqueous
Date Collected: 08-Apr-19 17:00

Laboratory Data

Lab Sample: 1900728-05
Date Received: 11-Apr-19 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	5.22	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFPeA	2706-90-3	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFBS	375-73-5	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
4:2 FTS	757124-72-4	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFHxA	307-24-4	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFPeS	2706-91-4	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFHpA	375-85-9	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFHxS	355-46-4	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
6:2 FTS	27619-97-2	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFOA	335-67-1	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFHpS	375-92-8	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFNA	375-95-1	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFOSA	754-91-6	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFOS	1763-23-1	1.43	1.39	2.02	4.05	J	B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFDA	335-76-2	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
8:2 FTS	39108-34-4	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFNS	68259-12-1	ND	1.96	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
MeFOSAA	2355-31-9	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
EtFOSAA	2991-50-6	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFUnA	2058-94-8	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFDS	335-77-3	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFDoA	307-55-1	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFTrDA	72629-94-8	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
PFTeDA	376-06-7	ND	1.39	2.02	4.05		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	93.9	60 - 130		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C3-PFPeA	IS	88.7	60 - 150		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C3-PFBS	IS	90.8	60 - 150		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C2-4:2 FTS	IS	96.8	20 - 150		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C2-PFHxA	IS	88.9	70 - 130		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C4-PFHpA	IS	89.6	60 - 150		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C3-PFHxS	IS	88.8	60 - 130		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C2-6:2 FTS	IS	102	40 - 150		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C2-PFOA	IS	83.8	60 - 130		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C5-PFNA	IS	78.9	50 - 130		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C8-PFOSA	IS	53.7	20 - 150		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C8-PFOS	IS	85.7	60 - 130		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C2-PFDA	IS	75.5	60 - 130		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1

Sample ID: SW011904081700MK **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W11-CA05
Matrix: Aqueous
Date Collected: 08-Apr-19 17:00

Laboratory Data

Lab Sample: 1900728-05
Date Received: 11-Apr-19 09:35
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	95.9	40 - 150		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
d3-MeFOSAA	IS	66.9	50 - 150		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
d5-EtFOSAA	IS	67.0	50 - 150		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C2-PFUnA	IS	65.7	60 - 130		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C2-PFDoA	IS	63.8	30 - 130		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1
13C2-PFTeDA	IS	62.4	20 - 150		B9D0139	17-Apr-19	0.247 L	19-Apr-19 02:48	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: TD011904081735MK **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W11-CA05
Matrix: Aqueous
Date Collected: 08-Apr-19 17:35

Laboratory Data

Lab Sample: 1900728-06
Date Received: 11-Apr-19 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFPeA	2706-90-3	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFBS	375-73-5	7.80	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
4:2 FTS	757124-72-4	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFHxA	307-24-4	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFPeS	2706-91-4	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFHpA	375-85-9	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFHxS	355-46-4	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
6:2 FTS	27619-97-2	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFOA	335-67-1	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFHpS	375-92-8	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFNA	375-95-1	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFOSA	754-91-6	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFOS	1763-23-1	1.41	1.36	1.98	3.97	J, Q	B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFDA	335-76-2	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
8:2 FTS	39108-34-4	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFNS	68259-12-1	ND	1.92	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
MeFOSAA	2355-31-9	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
EtFOSAA	2991-50-6	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFUnA	2058-94-8	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFDS	335-77-3	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFDoA	307-55-1	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFTrDA	72629-94-8	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
PFTeDA	376-06-7	ND	1.36	1.98	3.97		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	98.4	60 - 130		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C3-PFPeA	IS	98.8	60 - 150		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C3-PFBS	IS	95.0	60 - 150		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C2-4:2 FTS	IS	94.8	20 - 150		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C2-PFHxA	IS	94.7	70 - 130		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C4-PFHpA	IS	96.3	60 - 150		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C3-PFHxS	IS	90.7	60 - 130		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C2-6:2 FTS	IS	106	40 - 150		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C2-PFOA	IS	90.5	60 - 130		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C5-PFNA	IS	79.9	50 - 130		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C8-PFOSA	IS	52.6	20 - 150		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C8-PFOS	IS	92.9	60 - 130		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C2-PFDA	IS	70.2	60 - 130		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1

Sample ID: TD011904081735MK **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W11-CA05
Matrix: Aqueous
Date Collected: 08-Apr-19 17:35

Laboratory Data

Lab Sample: 1900728-06
Date Received: 11-Apr-19 09:35
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	98.5	40 - 150		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
d3-MeFOSAA	IS	70.4	50 - 150		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
d5-EtFOSAA	IS	74.9	50 - 150		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C2-PFUnA	IS	69.2	60 - 130		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C2-PFDoA	IS	73.6	30 - 130		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1
13C2-PFTeDA	IS	83.3	20 - 150		B9D0139	17-Apr-19	0.252 L	19-Apr-19 02:59	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: TD011904081845MK **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W11-CA04
Matrix: Aqueous
Date Collected: 08-Apr-19 18:45

Laboratory Data

Lab Sample: 1900728-09
Date Received: 11-Apr-19 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFPeA	2706-90-3	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFBS	375-73-5	8.55	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
4:2 FTS	757124-72-4	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFHxA	307-24-4	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFPeS	2706-91-4	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFHpA	375-85-9	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFHxS	355-46-4	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
6:2 FTS	27619-97-2	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFOA	335-67-1	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFHpS	375-92-8	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFNA	375-95-1	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFOSA	754-91-6	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFOS	1763-23-1	4.55	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFDA	335-76-2	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
8:2 FTS	39108-34-4	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFNS	68259-12-1	ND	2.00	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
MeFOSAA	2355-31-9	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
EtFOSAA	2991-50-6	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFUnA	2058-94-8	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFDS	335-77-3	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFDoA	307-55-1	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFTrDA	72629-94-8	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
PFTeDA	376-06-7	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	97.1	60 - 130		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C3-PFPeA	IS	96.3	60 - 150		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C3-PFBS	IS	99.0	60 - 150		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C2-4:2 FTS	IS	98.8	20 - 150		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C2-PFHxA	IS	92.6	70 - 130		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C4-PFHpA	IS	94.2	60 - 150		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C3-PFHxS	IS	92.2	60 - 130		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C2-6:2 FTS	IS	103	40 - 150		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C2-PFOA	IS	92.0	60 - 130		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C5-PFNA	IS	88.2	50 - 130		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C8-PFOSA	IS	64.9	20 - 150		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C8-PFOS	IS	88.4	60 - 130		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C2-PFDA	IS	83.9	60 - 130		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1

Sample ID: TD011904081845MK **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W11-CA04
Matrix: Aqueous
Date Collected: 08-Apr-19 18:45

Laboratory Data

Lab Sample: 1900728-09
Date Received: 11-Apr-19 09:35
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	102	40 - 150		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
d3-MeFOSAA	IS	84.8	50 - 150		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
d5-EtFOSAA	IS	79.8	50 - 150		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C2-PFUnA	IS	77.4	60 - 130		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C2-PFDoA	IS	72.7	30 - 130		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1
13C2-PFTeDA	IS	77.9	20 - 150		B9D0139	17-Apr-19	0.242 L	19-Apr-19 03:09	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SW011904081930MK

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W11-CA04
Matrix: Aqueous
Date Collected: 08-Apr-19 19:30

Laboratory Data

Lab Sample: 1900728-11
Date Received: 11-Apr-19 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	5.21	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFPeA	2706-90-3	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFBS	375-73-5	5.16	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
4:2 FTS	757124-72-4	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFHxA	307-24-4	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFPeS	2706-91-4	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFHpA	375-85-9	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFHxS	355-46-4	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
6:2 FTS	27619-97-2	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFOA	335-67-1	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFHpS	375-92-8	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFNA	375-95-1	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFOSA	754-91-6	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFOS	1763-23-1	3.75	1.42	2.07	4.14	J	B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFDA	335-76-2	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
8:2 FTS	39108-34-4	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFNS	68259-12-1	ND	2.01	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
MeFOSAA	2355-31-9	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
EtFOSAA	2991-50-6	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFUnA	2058-94-8	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFDS	335-77-3	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFDoA	307-55-1	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFTrDA	72629-94-8	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
PFTeDA	376-06-7	ND	1.42	2.07	4.14		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.0	60 - 130		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C3-PFPeA	IS	93.1	60 - 150		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C3-PFBS	IS	89.6	60 - 150		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C2-4:2 FTS	IS	91.8	20 - 150		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C2-PFHxA	IS	90.4	70 - 130		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C4-PFHpA	IS	92.1	60 - 150		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C3-PFHxS	IS	89.2	60 - 130		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C2-6:2 FTS	IS	103	40 - 150		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C2-PFOA	IS	85.5	60 - 130		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C5-PFNA	IS	79.8	50 - 130		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C8-PFOSA	IS	60.6	20 - 150		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C8-PFOS	IS	92.8	60 - 130		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C2-PFDA	IS	73.0	60 - 130		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1

Sample ID: SW011904081930MK

PFAS Isotope Dilution Method

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Aqueous
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 19:30
Location:	BRON-07S08W11-CA04		

Laboratory Data

Lab Sample:	1900728-11	Column:	BEH C18
Date Received:	11-Apr-19 09:35		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	97.5	40 - 150		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
d3-MeFOSAA	IS	68.7	50 - 150		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
d5-EtFOSAA	IS	73.4	50 - 150		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C2-PFUnA	IS	72.7	60 - 130		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C2-PFDoA	IS	67.2	30 - 130		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1
13C2-PFTeDA	IS	73.8	20 - 150		B9D0139	17-Apr-19	0.241 L	19-Apr-19 03:20	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
D	Dilution
DL	Detection limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limits of Detection
LOQ	Limits of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
NA	Not applicable
ND	Not Detected
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)
*	See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	015
Texas Commission on Environmental Quality	T104704189-19-10
Virginia Department of General Services	9618
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1900728 Temp: 0.5 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: **Statewide WWTP Biosolids PFAS Evaluation** PO#: **60588767.01** Sampler: **Michal Kosciarz + Rachel Lopez** (name)

TAT (check one): Standard: [x] 21 days; Rush (surcharge may apply): [ ] 14 days [ ] 7 days Specify:

Invoice to: Name	Company	Address	City	State	Ph#	Fax#
Stephanie Kammer	**MDEQ**	**525 W. Allegan Street**	**Lansing**	**MI**	**517-897-1597**	**517-241-3571**

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Michal Kosciarz	**4/10/2019**	**1830**	Marissa Sparks MSparks	04/11/19	0935
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

Method of Shipment:

ATTN: Jennifer Miller

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	PFAS Isotope Dilution: List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other, Please List Below	USEPA Method 537: PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
SXDU41904081450RL	4/8/19	1450	BRON-07S08W10-CA03	1	PJ	SO			X							
SW031904081510RL	4/8/19	1510	BRON-07S08W10-CA03	2	P	AQ			X							
SW021904081525RL	4/8/19	1525	BRON-07S08W10-CA03	2	P	AQ			X							
SXDU11904081700RL	4/8/19	1700	BRON-07S08W11-CA05	1	PJ	SO			X							
SW011904081700MK	4/8/19	1700	BRON-07S08W11-CA05	2	P	AQ			X							
TD011904081735MK	4/8/19	1735	BRON-07S08W11-CA05	2	P	AQ			X							
SXDU21904081755RL	4/8/19	1755	BRON-07S08W11-CA05	1	PJ	SO			X							
SXDU11904081825RL	4/8/19	1825	BRON-07S08W11-CA04	1	PJ	SO			X							
TD011904081845MK	4/8/19	1845	BRON-07S08W11-CA04	2	P	AQ			X							
SXDU21904081910RL	4/8/19	1910	BRON-07S08W11-CA04	1	PJ	SO			X							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street, Constitution Hall, 1st South West**
City: **Lansing** State: **MI** Zip **30242**
Phone: **517-897-1597** Fax: **517-241-3571**
Email: dorin.bogdan@aecom.com

Container Types: P= HDPE, PJ= HDPE Jar
O = Other:

Bottle Preservation Type: T = Thiosulfate,
TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, BS=Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1900728 Temp: 0.5 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: **Statewide WWTP Biosolids PFAS Evaluation** PO#: **60588767.01** Sampler: **Michal Kosciarz + Rachel Lopez** (name)

TAT (check one): Standard: [x] 21 days Rush (surcharge may apply) [ ] 14 days [ ] 7 days Specify:

Invoice to: Name	Company	Address	City	State	Ph#	Fax#
Stephanie Kammer	**MDEQ**	**525 W. Allegan Street**	**Lansing**	**MI**	**517-897-1597**	**517-241-3571**

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Michal Kosciarz	**4/10/2019**	**1830**	Marissa Sparks MSparks	04/11/19	0935
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment:

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	PFAS Isotope Dilution List of 21	List of 21 w/Isomer's	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	USEPA Method 537 PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
SW011904081930MK	**4/8/19**	**1930**	**BRON-07S08W11-CA04**	**2**	**P**	**AQ**			X							
									X							
									X							
									X							
									X							
									X							
									X							
									X							
									X							
									X							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street, Constitution Hall, 1st South West**
City: **Lansing** State: **MI** Zip **30242**
Phone: **517-897-1597** Fax: **517-241-3571**
Email: dorin.bogdan@aecom.com

Container Types: P= HDPE, PJ= HDPE Jar
O = Other:

Bottle Preservation Type: T = Thiosulfate,
TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, BS=Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 1900728 TAT Std

Samples Arrival:	**Date/Time** 04/11/19 0935	**Initials:** WWS	**Location:** WR-2 **Shelf/Rack:** N/A
Logged In:	**Date/Time** 04/12/19 1412	**Initials:** KE	**Location:** WR-2 **Shelf/Rack:** A4 & A3/E7

Delivered By:	(FedEx)	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	(Ice)	Blue Ice	Dry Ice	None		
Temp °C: 0.6 (uncorrected) **Temp °C:** 0.5 (corrected)	**Probe used:** Y / (N)	**Thermometer ID:** IR-4				

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?			✓
Shipping Documentation Present?	✓		
Airbill 1 of 2 Trk # 7855 7749 8536	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?		✓	✓

If Chlorinated or Drinking Water Samples, Acceptable Preservation?						✓
Preservation Documented:	$Na_2S_2O_3$ Trizma (None) Other				Yes	No	(NA)
Shipping Container	(Vista)	Client	(Retain)	Return	Dispose	

Comments:

May 02, 2019

Vista Work Order No. 1900723

Ms. Maya Murshak
Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Dear Ms. Murshak,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on April 11, 2019 under your Project Name 'Statewide WWTP Biosolids PFAS Evaluation'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Work Order No. 1900723
Case Narrative

Sample Condition on Receipt:

Seven aqueous samples and three solid samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology. A sample ID discrepancy was noted; sample "EB02-1904081315RL" has been reported as listed on the CoC.

Analytical Notes:

PFAS Isotope Dilution Method

The aqueous samples were extracted and analyzed for a selected list of PFAS using Vista's PFAS Isotope Dilution Method. This method is listed on Vista's NELAP certificate as Modified EPA Method 537. The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

The following samples contained particulate and were centrifuged prior to extraction:

Laboratory ID	Sample Name
1900723-02	SXDU11904081125RL
1900723-03	SXDU21904081210RL
1900723-04	SXDU31904081300RL
1900723-06	SW011904081320MK
1900723-07	SW061904081335MK
1900723-08	SW041904081430MK
1900723-09	SW051904081440MK
1900723-10	SW071904081450MK

Holding Times

The samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries for all QC and field samples were within the acceptance criteria.

VAL-PFAS Method

The solid samples were extracted and analyzed for a selected list of PFAS using VAL Method PFAS. The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The samples were extracted and analyzed within the hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries for all QC and field samples were within the acceptance criteria.

TABLE OF CONTENTS

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1900723-01	EB01-1904081025RL	08-Apr-19 10:25	11-Apr-19 09:35	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1900723-02	SXDU11904081125RL	08-Apr-19 11:25	11-Apr-19 09:35	HDPE Jar, 6 oz
1900723-03	SXDU21904081210RL	08-Apr-19 12:10	11-Apr-19 09:35	HDPE Jar, 6 oz
1900723-04	SXDU31904081300RL	08-Apr-19 13:00	11-Apr-19 09:35	HDPE Jar, 6 oz
1900723-05	EB02-1904081305RL	08-Apr-19 13:05	11-Apr-19 09:35	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1900723-06	SW011904081320MK	08-Apr-19 13:20	11-Apr-19 09:35	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1900723-07	SW061904081335MK	08-Apr-19 13:35	11-Apr-19 09:35	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1900723-08	SW041904081430MK	08-Apr-19 14:30	11-Apr-19 09:35	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1900723-09	SW051904081440MK	08-Apr-19 14:40	11-Apr-19 09:35	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1900723-10	SW071904081450MK	08-Apr-19 14:50	11-Apr-19 09:35	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Aqueous

Laboratory Data

Lab Sample: B9D0141-BLK1
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFPeA	2706-90-3	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFBS	375-73-5	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
4:2 FTS	757124-72-4	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFHxA	307-24-4	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFPeS	2706-91-4	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFHpA	375-85-9	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFHxS	355-46-4	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
6:2 FTS	27619-97-2	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFOA	335-67-1	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFHpS	375-92-8	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFNA	375-95-1	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFOSA	754-91-6	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFOS	1763-23-1	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFDA	335-76-2	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
8:2 FTS	39108-34-4	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFNS	68259-12-1	ND	1.94	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
MeFOSAA	2355-31-9	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
EtFOSAA	2991-50-6	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFUnA	2058-94-8	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFDS	335-77-3	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFDoA	307-55-1	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFTrDA	72629-94-8	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
PFTeDA	376-06-7	ND	1.37	2.00	4.00		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.7	60 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C3-PFPeA	IS	98.3	60 - 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C3-PFBS	IS	99.2	60 - 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C2-4:2 FTS	IS	95.1	20 - 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C2-PFHxA	IS	94.4	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C4-PFHpA	IS	93.8	60 - 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C3-PFHxS	IS	94.0	60 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C2-6:2 FTS	IS	90.2	40 - 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C2-PFOA	IS	93.9	60 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C5-PFNA	IS	78.9	50 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C8-PFOSA	IS	47.1	20 - 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C8-PFOS	IS	87.0	60 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C2-PFDA	IS	70.6	60 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Aqueous

Laboratory Data

Lab Sample: B9D0141-BLK1
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	85.4	40 - 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
d3-MeFOSAA	IS	67.1	50 - 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
d5-EtFOSAA	IS	63.3	50 - 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C2-PFUnA	IS	67.4	60 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C2-PFDoA	IS	62.0	30 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1
13C2-PFTeDA	IS	46.7	20 - 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:31	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Aqueous

Laboratory Data

Lab Sample: B9D0141-BS1
Column: BEH C18

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	38.6	40.0	96.4	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFPeA	2706-90-3	36.9	40.0	92.4	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFBS	375-73-5	35.2	40.0	88.0	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
4:2 FTS	757124-72-4	37.9	40.0	94.6	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFHxA	307-24-4	39.7	40.0	99.1	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFPeS	2706-91-4	36.2	40.0	90.5	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFHpA	375-85-9	37.1	40.0	92.7	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFHxS	355-46-4	38.3	40.0	95.7	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
6:2 FTS	27619-97-2	40.0	40.0	99.9	60 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFOA	335-67-1	38.2	40.0	95.5	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFHpS	375-92-8	42.2	40.0	105	60 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFNA	375-95-1	34.3	40.0	85.8	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFOSA	754-91-6	36.9	40.0	92.3	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFOS	1763-23-1	40.4	40.0	101	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFDA	335-76-2	37.5	40.0	93.7	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
8:2 FTS	39108-34-4	38.4	40.0	96.0	60 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFNS	68259-12-1	35.5	40.0	88.8	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
MeFOSAA	2355-31-9	37.5	40.0	93.9	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
EtFOSAA	2991-50-6	34.6	40.0	86.5	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFUnA	2058-94-8	41.5	40.0	104	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFDS	335-77-3	34.3	40.0	85.8	60 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFDoA	307-55-1	37.3	40.0	93.2	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFTrDA	72629-94-8	34.7	40.0	86.7	60 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
PFTeDA	376-06-7	40.5	40.0	101	70 - 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.9	60- 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C3-PFPeA	IS	96.8	60- 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C3-PFBS	IS	93.6	60- 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C2-4:2 FTS	IS	84.1	20- 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C2-PFHxA	IS	93.3	70- 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C4-PFHpA	IS	94.6	60- 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C3-PFHxS	IS	82.1	60- 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C2-6:2 FTS	IS	94.6	40- 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C2-PFOA	IS	90.8	60- 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C5-PFNA	IS	83.2	50- 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Aqueous

Laboratory Data

Lab Sample: B9D0141-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOSA	IS	51.6	20- 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C8-PFOS	IS	81.5	60- 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C2-PFDA	IS	72.7	60- 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C2-8:2 FTS	IS	72.2	40- 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
d3-MeFOSAA	IS	67.4	50- 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
d5-EtFOSAA	IS	67.1	50- 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C2-PFUnA	IS	66.4	60- 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C2-PFDoA	IS	64.2	30- 130		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1
13C2-PFTeDA	IS	45.5	20- 150		B9D0141	22-Apr-19	0.250 L	26-Apr-19 03:21	1

Sample ID: EB01-1904081025RL

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-SHOVEL
Matrix: Aqueous
Date Collected: 08-Apr-19 10:25

Laboratory Data

Lab Sample: 1900723-01
Date Received: 11-Apr-19 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFPeA	2706-90-3	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFBS	375-73-5	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
4:2 FTS	757124-72-4	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFHxA	307-24-4	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFPeS	2706-91-4	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFHpA	375-85-9	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFHxS	355-46-4	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
6:2 FTS	27619-97-2	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFOA	335-67-1	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFHpS	375-92-8	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFNA	375-95-1	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFOSA	754-91-6	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFOS	1763-23-1	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFDA	335-76-2	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
8:2 FTS	39108-34-4	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFNS	68259-12-1	ND	1.96	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
MeFOSAA	2355-31-9	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
EtFOSAA	2991-50-6	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFUnA	2058-94-8	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFDS	335-77-3	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFDoA	307-55-1	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFTrDA	72629-94-8	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
PFTeDA	376-06-7	ND	1.39	2.02	4.05		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	98.4	60 - 130		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C3-PFPeA	IS	95.1	60 - 150		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C3-PFBS	IS	97.0	60 - 150		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C2-4:2 FTS	IS	95.3	20 - 150		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C2-PFHxA	IS	93.8	70 - 130		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C4-PFHpA	IS	98.8	60 - 150		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C3-PFHxS	IS	94.2	60 - 130		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C2-6:2 FTS	IS	93.4	40 - 150		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C2-PFOA	IS	97.2	60 - 130		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C5-PFNA	IS	88.3	50 - 130		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C8-PFOSA	IS	42.3	20 - 150		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C8-PFOS	IS	91.4	60 - 130		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C2-PFDA	IS	87.4	60 - 130		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1

Sample ID: EB01-1904081025RL

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-SHOVEL
Matrix: Aqueous
Date Collected: 08-Apr-19 10:25

Laboratory Data

Lab Sample: 1900723-01
Date Received: 11-Apr-19 09:35
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	92.0	40 - 150		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
d3-MeFOSAA	IS	71.1	50 - 150		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
d5-EtFOSAA	IS	79.3	50 - 150		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C2-PFUnA	IS	74.7	60 - 130		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C2-PFDoA	IS	69.4	30 - 130		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1
13C2-PFTeDA	IS	72.2	20 - 150		B9D0141	22-Apr-19	0.247 L	26-Apr-19 03:42	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: EB02-1904081305RL

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-DIPPER
Matrix: Aqueous
Date Collected: 08-Apr-19 13:05

Laboratory Data

Lab Sample: 1900723-05
Date Received: 11-Apr-19 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFPeA	2706-90-3	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFBS	375-73-5	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
4:2 FTS	757124-72-4	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFHxA	307-24-4	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFPeS	2706-91-4	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFHpA	375-85-9	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFHxS	355-46-4	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
6:2 FTS	27619-97-2	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFOA	335-67-1	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFHpS	375-92-8	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFNA	375-95-1	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFOSA	754-91-6	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFOS	1763-23-1	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFDA	335-76-2	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
8:2 FTS	39108-34-4	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFNS	68259-12-1	ND	2.03	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
MeFOSAA	2355-31-9	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
EtFOSAA	2991-50-6	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFUnA	2058-94-8	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFDS	335-77-3	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFDoA	307-55-1	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFTrDA	72629-94-8	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
PFTeDA	376-06-7	ND	1.44	2.10	4.20		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	97.9	60 - 130		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C3-PFPeA	IS	97.2	60 - 150		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C3-PFBS	IS	101	60 - 150		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C2-4:2 FTS	IS	95.5	20 - 150		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C2-PFHxA	IS	96.1	70 - 130		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C4-PFHpA	IS	92.7	60 - 150		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C3-PFHxS	IS	97.4	60 - 130		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C2-6:2 FTS	IS	95.1	40 - 150		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C2-PFOA	IS	92.4	60 - 130		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C5-PFNA	IS	87.4	50 - 130		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C8-PFOSA	IS	46.2	20 - 150		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C8-PFOS	IS	92.0	60 - 130		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C2-PFDA	IS	79.2	60 - 130		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1

Sample ID: EB02-1904081305RL

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-DIPPER
Matrix: Aqueous
Date Collected: 08-Apr-19 13:05

Laboratory Data

Lab Sample: 1900723-05
Date Received: 11-Apr-19 09:35
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	89.0	40 - 150		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
d3-MeFOSAA	IS	58.7	50 - 150		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
d5-EtFOSAA	IS	66.5	50 - 150		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C2-PFUnA	IS	72.8	60 - 130		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C2-PFDoA	IS	60.7	30 - 130		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1
13C2-PFTeDA	IS	70.4	20 - 150		B9D0141	22-Apr-19	0.238 L	26-Apr-19 03:52	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SW011904081320MK **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W10-CA03
Matrix: Aqueous
Date Collected: 08-Apr-19 13:20

Laboratory Data

Lab Sample: 1900723-06
Date Received: 11-Apr-19 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	1.42	1.41	2.06	4.11	J	B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFPeA	2706-90-3	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFBS	375-73-5	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
4:2 FTS	757124-72-4	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFHxA	307-24-4	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFPeS	2706-91-4	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFHpA	375-85-9	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFHxS	355-46-4	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
6:2 FTS	27619-97-2	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFOA	335-67-1	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFHpS	375-92-8	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFNA	375-95-1	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFOSA	754-91-6	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFOS	1763-23-1	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFDA	335-76-2	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
8:2 FTS	39108-34-4	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFNS	68259-12-1	ND	1.99	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
MeFOSAA	2355-31-9	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
EtFOSAA	2991-50-6	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFUnA	2058-94-8	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFDS	335-77-3	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFDoA	307-55-1	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFTrDA	72629-94-8	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
PFTeDA	376-06-7	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.5	60 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C3-PFPeA	IS	99.6	60 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C3-PFBS	IS	94.2	60 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C2-4:2 FTS	IS	92.7	20 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C2-PFHxA	IS	93.6	70 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C4-PFHpA	IS	102	60 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C3-PFHxS	IS	90.6	60 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C2-6:2 FTS	IS	85.6	40 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C2-PFOA	IS	96.1	60 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C5-PFNA	IS	93.7	50 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C8-PFOSA	IS	55.2	20 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C8-PFOS	IS	83.3	60 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C2-PFDA	IS	86.7	60 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1

Sample ID: SW011904081320MK **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W10-CA03
Matrix: Aqueous
Date Collected: 08-Apr-19 13:20

Laboratory Data

Lab Sample: 1900723-06
Date Received: 11-Apr-19 09:35
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	88.1	40 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
d3-MeFOSAA	IS	69.5	50 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
d5-EtFOSAA	IS	65.8	50 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C2-PFUnA	IS	75.3	60 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C2-PFDoA	IS	69.0	30 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1
13C2-PFTeDA	IS	71.4	20 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:03	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SW061904081335MK

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W10-CA03
Matrix: Aqueous
Date Collected: 08-Apr-19 13:35

Laboratory Data

Lab Sample: 1900723-07
Date Received: 11-Apr-19 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	1.47	1.35	1.98	3.95	J	B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFPeA	2706-90-3	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFBS	375-73-5	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
4:2 FTS	757124-72-4	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFHxA	307-24-4	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFPeS	2706-91-4	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFHpA	375-85-9	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFHxS	355-46-4	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
6:2 FTS	27619-97-2	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFOA	335-67-1	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFHpS	375-92-8	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFNA	375-95-1	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFOSA	754-91-6	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFOS	1763-23-1	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFDA	335-76-2	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
8:2 FTS	39108-34-4	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFNS	68259-12-1	ND	1.91	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
MeFOSAA	2355-31-9	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
EtFOSAA	2991-50-6	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFUnA	2058-94-8	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFDS	335-77-3	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFDoA	307-55-1	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFTrDA	72629-94-8	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
PFTeDA	376-06-7	ND	1.35	1.98	3.95		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	98.7	60 - 130		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C3-PFPeA	IS	99.2	60 - 150		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C3-PFBS	IS	97.5	60 - 150		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C2-4:2 FTS	IS	97.2	20 - 150		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C2-PFHxA	IS	98.1	70 - 130		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C4-PFHpA	IS	101	60 - 150		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C3-PFHxS	IS	97.3	60 - 130		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C2-6:2 FTS	IS	89.2	40 - 150		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C2-PFOA	IS	88.5	60 - 130		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C5-PFNA	IS	95.9	50 - 130		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C8-PFOSA	IS	66.7	20 - 150		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C8-PFOS	IS	86.7	60 - 130		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C2-PFDA	IS	91.4	60 - 130		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1

Sample ID: SW061904081335MK

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W10-CA03
Matrix: Aqueous
Date Collected: 08-Apr-19 13:35

Laboratory Data

Lab Sample: 1900723-07
Date Received: 11-Apr-19 09:35
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	88.2	40 - 150		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
d3-MeFOSAA	IS	76.8	50 - 150		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
d5-EtFOSAA	IS	81.9	50 - 150		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C2-PFUnA	IS	86.3	60 - 130		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C2-PFDoA	IS	74.6	30 - 130		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1
13C2-PFTeDA	IS	77.1	20 - 150		B9D0141	22-Apr-19	0.253 L	26-Apr-19 04:14	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SW041904081430MK **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W10-CA03
Matrix: Aqueous
Date Collected: 08-Apr-19 14:30

Laboratory Data

Lab Sample: 1900723-08
Date Received: 11-Apr-19 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	2.85	1.45	2.11	4.22	J	B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFPeA	2706-90-3	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFBS	375-73-5	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
4:2 FTS	757124-72-4	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFHxA	307-24-4	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFPeS	2706-91-4	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFHpA	375-85-9	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFHxS	355-46-4	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
6:2 FTS	27619-97-2	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFOA	335-67-1	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFHpS	375-92-8	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFNA	375-95-1	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFOSA	754-91-6	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFOS	1763-23-1	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFDA	335-76-2	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
8:2 FTS	39108-34-4	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFNS	68259-12-1	ND	2.04	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
MeFOSAA	2355-31-9	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
EtFOSAA	2991-50-6	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFUnA	2058-94-8	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFDS	335-77-3	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFDoA	307-55-1	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFTrDA	72629-94-8	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
PFTeDA	376-06-7	ND	1.45	2.11	4.22		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.8	60 - 130		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C3-PFPeA	IS	101	60 - 150		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C3-PFBS	IS	87.1	60 - 150		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C2-4:2 FTS	IS	92.4	20 - 150		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C2-PFHxA	IS	98.0	70 - 130		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C4-PFHpA	IS	97.6	60 - 150		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C3-PFHxS	IS	85.5	60 - 130		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C2-6:2 FTS	IS	96.7	40 - 150		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C2-PFOA	IS	94.6	60 - 130		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C5-PFNA	IS	86.4	50 - 130		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C8-PFOSA	IS	51.2	20 - 150		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C8-PFOS	IS	83.8	60 - 130		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C2-PFDA	IS	80.9	60 - 130		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1

Sample ID: SW041904081430MK **PFAS Isotope Dilution Method**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Aqueous
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 14:30
Location:	BRON-07S08W10-CA03		

Laboratory Data

Lab Sample:	1900723-08	Column:	BEH C18
Date Received:	11-Apr-19 09:35		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	81.4	40 - 150		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
d3-MeFOSAA	IS	74.1	50 - 150		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
d5-EtFOSAA	IS	74.3	50 - 150		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C2-PFUnA	IS	74.1	60 - 130		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C2-PFDoA	IS	68.1	30 - 130		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1
13C2-PFTeDA	IS	68.9	20 - 150		B9D0141	22-Apr-19	0.237 L	26-Apr-19 04:24	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SW051904081440MK **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W10-CA03
Matrix: Aqueous
Date Collected: 08-Apr-19 14:40

Laboratory Data

Lab Sample: 1900723-09
Date Received: 11-Apr-19 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	2.57	1.41	2.06	4.11	J	B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFPeA	2706-90-3	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFBS	375-73-5	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
4:2 FTS	757124-72-4	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFHxA	307-24-4	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFPeS	2706-91-4	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFHpA	375-85-9	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFHxS	355-46-4	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
6:2 FTS	27619-97-2	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFOA	335-67-1	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFHpS	375-92-8	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFNA	375-95-1	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFOSA	754-91-6	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFOS	1763-23-1	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFDA	335-76-2	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
8:2 FTS	39108-34-4	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFNS	68259-12-1	ND	1.99	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
MeFOSAA	2355-31-9	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
EtFOSAA	2991-50-6	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFUnA	2058-94-8	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFDS	335-77-3	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFDoA	307-55-1	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFTrDA	72629-94-8	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
PFTeDA	376-06-7	ND	1.41	2.06	4.11		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	99.2	60 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C3-PFPeA	IS	97.6	60 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C3-PFBS	IS	92.7	60 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C2-4:2 FTS	IS	98.8	20 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C2-PFHxA	IS	97.7	70 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C4-PFHpA	IS	97.2	60 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C3-PFHxS	IS	90.8	60 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C2-6:2 FTS	IS	92.3	40 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C2-PFOA	IS	99.0	60 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C5-PFNA	IS	87.6	50 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C8-PFOSA	IS	58.0	20 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C8-PFOS	IS	87.7	60 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C2-PFDA	IS	91.9	60 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1

Sample ID: SW051904081440MK

PFAS Isotope Dilution Method

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Aqueous
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 14:40
Location:	BRON-07S08W10-CA03		

Laboratory Data

Lab Sample:	1900723-09	Column:	BEH C18
Date Received:	11-Apr-19 09:35		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	88.4	40 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
d3-MeFOSAA	IS	74.6	50 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
d5-EtFOSAA	IS	81.9	50 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C2-PFUnA	IS	78.9	60 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C2-PFDoA	IS	77.0	30 - 130		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1
13C2-PFTeDA	IS	69.7	20 - 150		B9D0141	22-Apr-19	0.243 L	26-Apr-19 04:35	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SW071904081450MK

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W10-CA03
Matrix: Aqueous
Date Collected: 08-Apr-19 14:50

Laboratory Data

Lab Sample: 1900723-10
Date Received: 11-Apr-19 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	3.30	1.45	2.12	4.25	J	B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFPeA	2706-90-3	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFBS	375-73-5	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
4:2 FTS	757124-72-4	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFHxA	307-24-4	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFPeS	2706-91-4	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFHpA	375-85-9	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFHxS	355-46-4	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
6:2 FTS	27619-97-2	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFOA	335-67-1	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFHpS	375-92-8	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFNA	375-95-1	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFOSA	754-91-6	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFOS	1763-23-1	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFDA	335-76-2	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
8:2 FTS	39108-34-4	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFNS	68259-12-1	ND	2.05	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
MeFOSAA	2355-31-9	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
EtFOSAA	2991-50-6	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFUnA	2058-94-8	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFDS	335-77-3	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFDoA	307-55-1	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFTrDA	72629-94-8	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
PFTeDA	376-06-7	ND	1.45	2.12	4.25		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	97.4	60 - 130		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C3-PFPeA	IS	91.9	60 - 150		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C3-PFBS	IS	87.8	60 - 150		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C2-4:2 FTS	IS	91.0	20 - 150		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C2-PFHxA	IS	92.0	70 - 130		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C4-PFHpA	IS	90.9	60 - 150		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C3-PFHxS	IS	89.0	60 - 130		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C2-6:2 FTS	IS	95.2	40 - 150		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C2-PFOA	IS	92.5	60 - 130		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C5-PFNA	IS	84.4	50 - 130		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C8-PFOSA	IS	58.5	20 - 150		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C8-PFOS	IS	84.3	60 - 130		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C2-PFDA	IS	80.7	60 - 130		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1

Sample ID: SW071904081450MK

PFAS Isotope Dilution Method

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Aqueous
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 14:50
Location:	BRON-07S08W10-CA03		

Laboratory Data

Lab Sample:	1900723-10	Column:	BEH C18
Date Received:	11-Apr-19 09:35		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	95.8	40 - 150		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
d3-MeFOSAA	IS	69.8	50 - 150		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
d5-EtFOSAA	IS	72.3	50 - 150		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C2-PFUnA	IS	75.9	60 - 130		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C2-PFDoA	IS	66.7	30 - 130		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1
13C2-PFTeDA	IS	65.0	20 - 150		B9D0141	22-Apr-19	0.236 L	26-Apr-19 04:45	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: Method Blank

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc. Matrix: Solid

Project: Statewide WWTP Biosolids PFAS Evaluation

Laboratory Data

Lab Sample: B9D0148-BLK1 Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFPeA	2706-90-3	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFBS	375-73-5	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
4:2 FTS	757124-72-4	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFHxA	307-24-4	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFPeS	2706-91-4	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFHpA	375-85-9	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFHxS	355-46-4	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
6:2 FTS	27619-97-2	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFOA	335-67-1	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFHpS	375-92-8	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFNA	375-95-1	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFOSA	754-91-6	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFOS	1763-23-1	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFDA	335-76-2	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
8:2 FTS	39108-34-4	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFNS	68259-12-1	ND	1.43	1.50	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
MeFOSAA	2355-31-9	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
EtFOSAA	2991-50-6	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFUnA	2058-94-8	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFDS	335-77-3	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFDoA	307-55-1	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFTrDA	72629-94-8	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
PFTeDA	376-06-7	ND	0.845	1.00	2.00		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.3	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C3-PFPeA	IS	87.5	60 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C3-PFBS	IS	97.6	60 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-4:2 FTS	IS	107	40 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-PFHxA	IS	89.5	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C4-PFHpA	IS	90.6	60 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C3-PFHxS	IS	97.6	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-6:2 FTS	IS	105	40 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-PFOA	IS	87.7	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C5-PFNA	IS	78.1	50 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C8-PFOSA	IS	42.1	20 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C8-PFOS	IS	87.3	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-PFDA	IS	78.1	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1

Sample ID: Method Blank

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc. Matrix: Solid

Project: Statewide WWTP Biosolids PFAS Evaluation

Laboratory Data

Lab Sample: B9D0148-BLK1 Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	93.2	40 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
d3-MeFOSAA	IS	72.2	50 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
d5-EtFOSAA	IS	68.4	50 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-PFUnA	IS	64.2	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-PFDoA	IS	52.0	30 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1
13C2-PFTeDA	IS	51.3	20 - 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:30	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: OPR **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Solid

Laboratory Data

Lab Sample: B9D0148-BS1
Column: BEH C18

Analyte	CAS Number	Amt Found (ng/g)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	10.9	10.0	109	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFPeA	2706-90-3	10.8	10.0	108	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFBS	375-73-5	10.1	10.0	101	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
4:2 FTS	757124-72-4	10.2	10.0	102	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFHxA	307-24-4	11.1	10.0	111	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFPeS	2706-91-4	11.4	10.0	114	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFHpA	375-85-9	10.2	10.0	102	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFHxS	355-46-4	10.3	10.0	103	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
6:2 FTS	27619-97-2	9.56	10.0	95.6	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFOA	335-67-1	10.6	10.0	106	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFHpS	375-92-8	10.2	10.0	102	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFNA	375-95-1	10.0	10.0	100	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFOSA	754-91-6	10.4	10.0	104	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFOS	1763-23-1	10.1	10.0	101	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFDA	335-76-2	10.1	10.0	101	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
8:2 FTS	39108-34-4	11.2	10.0	112	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFNS	68259-12-1	9.09	10.0	90.9	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
MeFOSAA	2355-31-9	10.2	10.0	102	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
EtFOSAA	2991-50-6	11.3	10.0	113	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFUnA	2058-94-8	10.5	10.0	105	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFDS	335-77-3	8.16	10.0	81.6	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFDoA	307-55-1	11.6	10.0	116	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFTrDA	72629-94-8	11.2	10.0	112	60 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
PFTeDA	376-06-7	9.87	10.0	98.7	70 - 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	91.8	60- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C3-PFPeA	IS	90.2	60- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C3-PFBS	IS	89.4	60- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-4:2 FTS	IS	96.6	40- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-PFHxA	IS	91.6	70- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C4-PFHpA	IS	92.7	60- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C3-PFHxS	IS	90.2	60- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-6:2 FTS	IS	103	40- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-PFOA	IS	97.3	60- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C5-PFNA	IS	85.5	50- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1

Sample ID: OPR **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Solid

Laboratory Data

Lab Sample: B9D0148-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOSA	IS	45.7	20- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C8-PFOS	IS	96.4	60- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-PFDA	IS	79.7	60- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-8:2 FTS	IS	95.4	40- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
d3-MeFOSAA	IS	66.0	50- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
d5-EtFOSAA	IS	66.7	50- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-PFUnA	IS	69.6	60- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-PFDoA	IS	56.3	30- 130		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1
13C2-PFTeDA	IS	58.7	20- 150		B9D0148	25-Apr-19	1.00 g	30-Apr-19 01:19	1

Sample ID: SXDU11904081125RL **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W10-CA03
Matrix: Soil
Date Collected: 08-Apr-19 11:25

Laboratory Data

Lab Sample: 1900723-02
Date Received: 11-Apr-19 09:35
% Solids: 86.7
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFPeA	2706-90-3	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFBS	375-73-5	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
4:2 FTS	757124-72-4	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFHxA	307-24-4	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFPeS	2706-91-4	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFHpA	375-85-9	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFHxS	355-46-4	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
6:2 FTS	27619-97-2	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFOA	335-67-1	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFHpS	375-92-8	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFNA	375-95-1	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFOSA	754-91-6	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFOS	1763-23-1	15.7	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFDA	335-76-2	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
8:2 FTS	39108-34-4	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFNS	68259-12-1	ND	1.37	1.44	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
MeFOSAA	2355-31-9	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
EtFOSAA	2991-50-6	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFUnA	2058-94-8	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFDS	335-77-3	1.01	0.812	0.961	1.92	J	B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFDoA	307-55-1	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFTrDA	72629-94-8	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
PFTeDA	376-06-7	ND	0.812	0.961	1.92		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	91.8	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C3-PFPeA	IS	93.8	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C3-PFBS	IS	88.5	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C2-4:2 FTS	IS	122	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C2-PFHxA	IS	86.6	70 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C4-PFHpA	IS	95.1	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C3-PFHxS	IS	91.8	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C2-6:2 FTS	IS	107	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C2-PFOA	IS	83.0	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C5-PFNA	IS	75.3	50 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C8-PFOSA	IS	34.4	20 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C8-PFOS	IS	85.5	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C2-PFDA	IS	88.2	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1

Sample ID: SXDU11904081125RL

VAL - PFAS

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 11:25
Location:	BRON-07S08W10-CA03		

Laboratory Data

Lab Sample:	1900723-02	Column:	BEH C18
Date Received:	11-Apr-19 09:35		
% Solids:	86.7		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	98.7	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
d3-MeFOSAA	IS	78.3	50 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
d5-EtFOSAA	IS	73.4	50 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C2-PFUnA	IS	69.2	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C2-PFDoA	IS	69.0	30 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1
13C2-PFTeDA	IS	46.9	20 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 01:41	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SXDU21904081210RL **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W10-CA03
Matrix: Soil
Date Collected: 08-Apr-19 12:10

Laboratory Data

Lab Sample: 1900723-03
Date Received: 11-Apr-19 09:35
% Solids: 78.1
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFPeA	2706-90-3	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFBS	375-73-5	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
4:2 FTS	757124-72-4	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFHxA	307-24-4	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFPeS	2706-91-4	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFHpA	375-85-9	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFHxS	355-46-4	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
6:2 FTS	27619-97-2	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFOA	335-67-1	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFHpS	375-92-8	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFNA	375-95-1	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFOSA	754-91-6	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFOS	1763-23-1	7.69	0.839	0.993	1.99	Q	B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFDA	335-76-2	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
8:2 FTS	39108-34-4	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFNS	68259-12-1	ND	1.42	1.49	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
MeFOSAA	2355-31-9	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
EtFOSAA	2991-50-6	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFUnA	2058-94-8	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFDS	335-77-3	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFDoA	307-55-1	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFTrDA	72629-94-8	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
PFTeDA	376-06-7	ND	0.839	0.993	1.99		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.2	60 - 130		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C3-PFPeA	IS	88.0	60 - 150		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C3-PFBS	IS	84.8	60 - 150		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C2-4:2 FTS	IS	134	40 - 150		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C2-PFHxA	IS	90.2	70 - 130		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C4-PFHpA	IS	87.9	60 - 150		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C3-PFHxS	IS	85.0	60 - 130		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C2-6:2 FTS	IS	103	40 - 150		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C2-PFOA	IS	79.4	60 - 130		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C5-PFNA	IS	84.2	50 - 130		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C8-PFOSA	IS	53.4	20 - 150		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C8-PFOS	IS	82.3	60 - 130		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C2-PFDA	IS	78.4	60 - 130		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1

Sample ID: SXDU21904081210RL

VAL - PFAS

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 12:10
Location:	BRON-07S08W10-CA03		

Laboratory Data

Lab Sample:	1900723-03	Column:	BEH C18
Date Received:	11-Apr-19 09:35		
% Solids:	78.1		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	122	40 - 150		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
d3-MeFOSAA	IS	89.0	50 - 150		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
d5-EtFOSAA	IS	89.2	50 - 150		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C2-PFUnA	IS	73.7	60 - 130		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C2-PFDoA	IS	65.4	30 - 130		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1
13C2-PFTeDA	IS	82.9	20 - 150		B9D0148	25-Apr-19	1.29 g	30-Apr-19 01:51	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: SXDU31904081300RL

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-07S08W10-CA03
Matrix: Soil
Date Collected: 08-Apr-19 13:00

Laboratory Data

Lab Sample: 1900723-04
Date Received: 11-Apr-19 09:35
% Solids: 83.7
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFPeA	2706-90-3	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFBS	375-73-5	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
4:2 FTS	757124-72-4	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFHxA	307-24-4	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFPeS	2706-91-4	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFHpA	375-85-9	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFHxS	355-46-4	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
6:2 FTS	27619-97-2	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFOA	335-67-1	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFHpS	375-92-8	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFNA	375-95-1	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFOSA	754-91-6	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFOS	1763-23-1	10.4	0.841	0.996	1.99	Q	B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFDA	335-76-2	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
8:2 FTS	39108-34-4	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFNS	68259-12-1	ND	1.42	1.49	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
MeFOSAA	2355-31-9	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
EtFOSAA	2991-50-6	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFUnA	2058-94-8	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFDS	335-77-3	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFDoA	307-55-1	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFTrDA	72629-94-8	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
PFTeDA	376-06-7	ND	0.841	0.996	1.99		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.6	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C3-PFPeA	IS	92.5	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C3-PFBS	IS	96.6	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C2-4:2 FTS	IS	133	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C2-PFHxA	IS	94.6	70 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C4-PFHpA	IS	86.6	60 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C3-PFHxS	IS	96.1	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C2-6:2 FTS	IS	114	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C2-PFOA	IS	101	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C5-PFNA	IS	88.9	50 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C8-PFOSA	IS	57.6	20 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C8-PFOS	IS	85.3	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C2-PFDA	IS	80.0	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1

Sample ID: SXDU31904081300RL

VAL - PFAS

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	08-Apr-19 13:00
Location:	BRON-07S08W10-CA03		

Laboratory Data

Lab Sample:	1900723-04	Column:	BEH C18
Date Received:	11-Apr-19 09:35		
% Solids:	83.7		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	108	40 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
d3-MeFOSAA	IS	79.1	50 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
d5-EtFOSAA	IS	77.5	50 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C2-PFUnA	IS	76.7	60 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C2-PFDoA	IS	75.9	30 - 130		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1
13C2-PFTeDA	IS	59.4	20 - 150		B9D0148	25-Apr-19	1.20 g	30-Apr-19 02:02	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
D	Dilution
DL	Detection limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limits of Detection
LOQ	Limits of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
NA	Not applicable
ND	Not Detected
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)
*	See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	015
Texas Commission on Environmental Quality	T104704189-19-10
Virginia Department of General Services	9618
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1900723 Temp: 0.5 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: **Statewide WWTP Biosolids PFAS Evaluation** PO#: **60588767.01** Sampler: **Michal Kosciarz + Rachel Lopez** (name)

TAT (check one): Standard: x 21 days; Rush (surcharge may apply): ☐ 14 days ☐ 7 days Specify:

Invoice to: Name	Company	Address	City	State	Ph#	Fax#
Stephanie Kammer	MDEQ	525 W. Allegan Street	Lansing	MI	517-897-1597	517-241-3571

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Michal Kosciarz	4/10/2019	1830	Marissa Sparks MSparks	04/11/19	0935
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment:

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	PFAS Isotope Dilution: List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	USEPA Method 537: PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
EB01-1904081025RL	4/8/19	1025	BRON-SHOVEL	2	P	AQ			X							
SXDU11904081125RL	4/8/19	1125	BRON-07S08W10-CA03	1	PJ	SO			X							
SXDU21904081210RL	4/8/19	1210	BRON-07S08W10-CA03	1	PJ	SO			X							
SXDU31904081300RL	4/8/19	1300	BRON-07S08W10-CA03	1	PJ	SO			X							
EB02-1904081305MK	4/8/19	1305	BRON-DIPPER	2	P	AQ			X							
SW011904081320MK	4/8/19	1320	BRON-07S08W10-CA03	2	P	AQ			X							
SW061904081335MK	4/8/19	1335	BRON-07S08W10-CA03	2	P	AQ			X							
SW041904081430MK	4/8/19	1430	BRON-07S08W10-CA03	2	P	AQ			X							
SW051904081440MK	4/8/19	1440	BRON-07S08W10-CA03	2	P	AQ			X							
SW071904081450MK	4/8/19	1450	BRON-07S08W10-CA03	2	P	AQ			X							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street, Constitution Hall, 1st South West**
City: **Lansing** State: **MI** Zip **30242**
Phone: **517-897-1597** Fax: **517-241-3571**
Email: dorin.bogdan@aecom.com

Container Types: P= HDPE, PJ= HDPE Jar
O = Other:

Bottle Preservation Type: T = Thiosulfate,
TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, BS=Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 1900723 TAT Std

Samples Arrival:	**Date/Time** 04/11/19 0935	**Initials:** WS	**Location:** WR-2 **Shelf/Rack:** N/A
Logged In:	**Date/Time** 04/12/19 1044	**Initials:** KE	**Location:** WR-2 **Shelf/Rack:** A4 & A3/E7

Delivered By:	(FedEx)	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	(Ice)	Blue Ice	Dry Ice	None		
Temp °C: 0.6 (uncorrected) / **Temp °C:** 0.5 (corrected)	**Probe used:** Y / (N)	**Thermometer ID:** IR-4				

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?			✓
Shipping Documentation Present?	✓		
Airbill 1 of 2 Trk # 7865 7749 8536	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?		✓	✓
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			✓

Preservation Documented:	$Na_2S_2O_3$ Trizma (None) Other				Yes	No	NA
Shipping Container	(Vista)	Client	(Retain)	Return	Dispose		

Comments: * EB02-1904081305RL (COC ID #) SAMPLE LABEL EB02-1904081305MK

Chain of Custody Anomaly/Sample Acceptance Form

Vista Analytical Laboratory

Client:	Merit Laboratories, Inc.	Workorder Number:	1900723
Contact:	Maya Murshak	Date Received:	11-Apr-19 09:35
Email:	mayamurshak@meritlabs.com	Documented by/date:	K. Elric 04/19/19
Phone:	(517) 827-2744		

Please review the following information and complete the Client Authorization section. To comply with NELAC regulations, we must receive authorization before proceeding with sample analysis.

- [ ] Sample Collection Date and/or Time not provided
- [ ] Temperature outside Method Requirement (WI-PHT)

  Temperature _____ °C Ice Present? Yes No Melted
- [ ] Sample ID Not Reconcilable
- [ ] Sample Holding Time Missed
- [ ] Insufficient Sample Size
- [ ] All Sample Container(s) Broken
- [ ] Drinking Water Incorrect Container Type
- [ ] Chain-of-Custody not received, illegible or destroyed
- [X] Other: **See Comments**

Comments/Samples Affected:
Sample ID Discrepancy:

Chain of Custody ID	**Container Label ID**
EB02-1904081305**RL**	EB02-1904081305**MK**

Client Authorization

Proceed with Analysis: (YES) NO Signature and Date [signature] 05/02/19

Client Comments/Instructions Client notified via email on 04/16/19.

December 27, 2018

Vista Work Order No. 1803576

Ms. Maya Murshak
Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Dear Ms. Murshak,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on November 09, 2018 under your Project Name 'Statewide WWTP Biosolids PFAS Evaluation'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Work Order No. 1803576
Case Narrative

Sample Condition on Receipt:

Two wastewater samples and one biosolid sample were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology. A revised CoC was received by email on November 26, 2018.

Analytical Notes:

PFAS Isotope Dilution Method

The aqueous samples were extracted and analyzed for a selected list of PFAS using Vista's PFAS Isotope Dilution Method. This method is listed on Vista's NELAP certificate as Modifed EPA Method 537. The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Sample "WW1810311500GC" contained particulate and was centrifuged prior to extraction.

Holding Times

The samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries outside the acceptance criteria are listed in the table below.

VAL-PFAS

The solid sample was extracted and analyzed for a selected list of PFAS using VAL Method PFAS. The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

The sample was centrifuged prior to the digestion procedure of the solid phase. Both the aqueous and solid phases of the sample were included in the extraction.

Holding Times

The sample was extracted and analyzed within the hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries outside the acceptance criteria are listed in the table below.

QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
1803576-02	WW1810311500GC	PFAS Isotope Dilution Method	d3-MeFOSAA	H	45.8
1803576-03	BS1810311445GC	VAL - PFAS	13C3-PFBA	H	18.3
1803576-03	BS1810311445GC	VAL - PFAS	13C2-PFHxA	H	66.5
1803576-03	BS1810311445GC	VAL - PFAS	13C8-PFOS	H	58.5
1803576-03	BS1810311445GC	VAL - PFAS	d3-MeFOSAA	H	47.2
1803576-03	BS1810311445GC	VAL - PFAS	d5-EtFOSAA	H	46.4
1803576-03	BS1810311445GC	VAL - PFAS	13C2-PFUnA	H	44.8
1803576-03	BS1810311445GC	VAL - PFAS	13C2-PFTeDA	H	10.2
B8K0069-BS1	B8K0069-BS1	PFAS Isotope Dilution Method	13C2-PFDA	H	58.4
B8K0188-BLK1	B8K0188-BLK1	VAL - PFAS	13C2-PFDA	H	57.2
B8K0188-BLK1	B8K0188-BLK1	VAL - PFAS	d3-MeFOSAA	H	29.5
B8K0188-BLK1	B8K0188-BLK1	VAL - PFAS	d5-EtFOSAA	H	29.8
B8K0188-BLK1	B8K0188-BLK1	VAL - PFAS	13C2-PFUnA	H	46.9
B8K0188-BS1	B8K0188-BS1	VAL - PFAS	d3-MeFOSAA	H	31.1
B8K0188-BS1	B8K0188-BS1	VAL - PFAS	d5-EtFOSAA	H	33.5
B8K0188-BS1	B8K0188-BS1	VAL - PFAS	13C2-PFUnA	H	47.5

H = Recovery was outside laboratory acceptance criteria.

TABLE OF CONTENTS

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1803576-01	WW1810311430GC	31-Oct-18 14:30	09-Nov-18 09:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1803576-02	WW1810311500GC	31-Oct-18 15:00	09-Nov-18 09:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1803576-03	BS1810311445GC	31-Oct-18 14:45	09-Nov-18 09:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Aqueous

Laboratory Data

Lab Sample: B8K0069-BLK1
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFPeA	2706-90-3	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFBS	375-73-5	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
4:2 FTS	757124-72-4	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFHxA	307-24-4	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFPeS	2706-91-4	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFHpA	375-85-9	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFHxS	355-46-4	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
6:2 FTS	27619-97-2	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFOA	335-67-1	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFHpS	375-92-8	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFNA	375-95-1	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFOSA	754-91-6	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFOS	1763-23-1	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFDA	335-76-2	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
8:2 FTS	39108-34-4	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFNS	68259-12-1	ND	1.94	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
MeFOSAA	2355-31-9	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
EtFOSAA	2991-50-6	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFUnA	2058-94-8	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFDS	335-77-3	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFDoA	307-55-1	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFTrDA	72629-94-8	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
PFTeDA	376-06-7	ND	1.37	2.00	4.00		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.9	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C3-PFPeA	IS	93.9	60 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C3-PFBS	IS	87.4	60 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C2-4:2 FTS	IS	78.2	40 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C2-PFHxA	IS	95.9	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C4-PFHpA	IS	96.4	60 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
18O2-PFHxS	IS	94.1	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C2-PFOA	IS	79.4	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C5-PFNA	IS	70.3	50 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C8-PFOSA	IS	36.0	20 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C8-PFOS	IS	89.4	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C2-PFDA	IS	62.5	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C2-8:2 FTS	IS	81.3	40 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Aqueous

Laboratory Data

Lab Sample: B8K0069-BLK1
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d3-MeFOSAA	IS	61.5	50 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
d5-EtFOSAA	IS	66.2	50 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C2-PFUnA	IS	60.8	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C2-PFDoA	IS	71.3	30 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1
13C2-PFTeDA	IS	59.0	20 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 03:07	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Aqueous

Laboratory Data

Lab Sample: B8K0069-BS1
Column: BEH C18

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	45.5	40.0	114	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFPeA	2706-90-3	45.8	40.0	114	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFBS	375-73-5	46.2	40.0	116	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
4:2 FTS	757124-72-4	47.5	40.0	119	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFHxA	307-24-4	46.2	40.0	115	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFPeS	2706-91-4	43.9	40.0	110	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFHpA	375-85-9	44.1	40.0	110	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFHxS	355-46-4	45.1	40.0	113	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
6:2 FTS	27619-97-2	51.8	40.0	129	60 - 130		B8K0069	13-Nov-18	0.250 L	12-Dec-18 14:53	1
PFOA	335-67-1	44.4	40.0	111	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFHpS	375-92-8	51.9	40.0	130	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFNA	375-95-1	46.6	40.0	116	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFOSA	754-91-6	44.4	40.0	111	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFOS	1763-23-1	43.6	40.0	109	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFDA	335-76-2	45.6	40.0	114	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
8:2 FTS	39108-34-4	47.0	40.0	117	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFNS	68259-12-1	42.2	40.0	105	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
MeFOSAA	2355-31-9	44.5	40.0	111	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
EtFOSAA	2991-50-6	42.8	40.0	107	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFUnA	2058-94-8	45.7	40.0	114	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFDS	335-77-3	43.3	40.0	108	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFDoA	307-55-1	46.0	40.0	115	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFTrDA	72629-94-8	44.1	40.0	110	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
PFTeDA	376-06-7	43.7	40.0	109	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	98.4	60- 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
13C3-PFPeA	IS	94.1	60- 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
13C3-PFBS	IS	92.4	60- 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
13C2-4:2 FTS	IS	82.8	40- 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
13C2-PFHxA	IS	98.0	70- 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
13C4-PFHpA	IS	98.5	60- 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
18O2-PFHxS	IS	93.1	60- 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
13C2-PFOA	IS	84.9	60- 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
13C5-PFNA	IS	69.6	50- 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
13C8-PFOSA	IS	34.6	20- 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Aqueous

Laboratory Data

Lab Sample: B8K0069-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOS	IS	83.2	60- 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
13C2-PFDA	IS	58.4	60- 130	H	B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
13C2-8:2 FTS	IS	78.1	40- 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
d3-MeFOSAA	IS	67.2	50- 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
d5-EtFOSAA	IS	65.0	50- 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
13C2-PFUnA	IS	61.0	60- 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
13C2-PFDoA	IS	66.6	30- 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1
13C2-PFTeDA	IS	56.7	20- 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 02:56	1

Sample ID: WW1810311430GC

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-MI0020729-EFPT1

Matrix: Wastewater
Date Collected: 31-Oct-18 14:30

Laboratory Data

Lab Sample: 1803576-01
Date Received: 09-Nov-18 09:41

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	2.92	1.37	2.00	4.01	J	B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFPeA	2706-90-3	7.14	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFBS	375-73-5	25.1	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
4:2 FTS	757124-72-4	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFHxA	307-24-4	10.7	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFPeS	2706-91-4	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFHpA	375-85-9	2.89	1.37	2.00	4.01	J	B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFHxS	355-46-4	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
6:2 FTS	27619-97-2	69.4	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFOA	335-67-1	2.40	1.37	2.00	4.01	J	B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFHpS	375-92-8	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFNA	375-95-1	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFOSA	754-91-6	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFOS	1763-23-1	169	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFDA	335-76-2	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
8:2 FTS	39108-34-4	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFNS	68259-12-1	ND	1.94	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
MeFOSAA	2355-31-9	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
EtFOSAA	2991-50-6	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFUnA	2058-94-8	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFDS	335-77-3	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFDoA	307-55-1	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFTrDA	72629-94-8	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
PFTeDA	376-06-7	ND	1.37	2.00	4.01		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.2	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C3-PFPeA	IS	93.6	60 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C3-PFBS	IS	93.0	60 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C2-4:2 FTS	IS	74.9	40 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C2-PFHxA	IS	95.5	70 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C4-PFHpA	IS	100	60 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
18O2-PFHxS	IS	99.5	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C2-PFOA	IS	92.8	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C5-PFNA	IS	87.1	50 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C8-PFOSA	IS	48.7	20 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C8-PFOS	IS	91.4	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C2-PFDA	IS	82.1	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C2-8:2 FTS	IS	94.4	40 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1

Sample ID: WW1810311430GC

PFAS Isotope Dilution Method

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Wastewater
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	31-Oct-18 14:30
Location:	BRON-MI0020729-EFPT1		

Laboratory Data

Lab Sample:	1803576-01	Column:	BEH C18
Date Received:	09-Nov-18 09:41		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d3-MeFOSAA	IS	74.8	50 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
d5-EtFOSAA	IS	81.4	50 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C2-PFUnA	IS	80.0	60 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C2-PFDoA	IS	84.2	30 - 130		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1
13C2-PFTeDA	IS	73.4	20 - 150		B8K0069	13-Nov-18	0.250 L	15-Nov-18 04:10	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: WW1810311500GC

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-MI0020729-IFPT1
Matrix: Wastewater
Date Collected: 31-Oct-18 15:00

Laboratory Data

Lab Sample: 1803576-02
Date Received: 09-Nov-18 09:41
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	3.79	1.52	2.22	4.44	J	B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFPeA	2706-90-3	4.65	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFBS	375-73-5	144	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
4:2 FTS	757124-72-4	8.78	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFHxA	307-24-4	4.52	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFPeS	2706-91-4	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFHpA	375-85-9	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFHxS	355-46-4	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
6:2 FTS	27619-97-2	1210	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFOA	335-67-1	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFHpS	375-92-8	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFNA	375-95-1	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFOSA	754-91-6	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFOS	1763-23-1	843	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFDA	335-76-2	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
8:2 FTS	39108-34-4	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFNS	68259-12-1	ND	2.15	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
MeFOSAA	2355-31-9	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
EtFOSAA	2991-50-6	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFUnA	2058-94-8	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFDS	335-77-3	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFDoA	307-55-1	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFTrDA	72629-94-8	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
PFTeDA	376-06-7	ND	1.52	2.22	4.44		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.9	60 - 130		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C3-PFPeA	IS	112	60 - 150		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C3-PFBS	IS	90.3	60 - 150		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C2-4:2 FTS	IS	68.2	40 - 150		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C2-PFHxA	IS	99.8	70 - 130		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C4-PFHpA	IS	113	60 - 150		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
18O2-PFHxS	IS	102	60 - 130		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C2-PFOA	IS	94.3	60 - 130		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C5-PFNA	IS	84.6	50 - 130		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C8-PFOSA	IS	44.7	20 - 150		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C8-PFOS	IS	82.8	60 - 130		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C2-PFDA	IS	66.5	60 - 130		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C2-8:2 FTS	IS	82.2	40 - 150		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1

Sample ID: WW1810311500GC **PFAS Isotope Dilution Method**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Wastewater
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	31-Oct-18 15:00
Location:	BRON-MI0020729-IFPT1		

Laboratory Data

Lab Sample:	1803576-02	Column:	BEH C18
Date Received:	09-Nov-18 09:41		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d3-MeFOSAA	IS	45.8	50 - 150	H	B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
d5-EtFOSAA	IS	57.7	50 - 150		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C2-PFUnA	IS	64.6	60 - 130		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C2-PFDoA	IS	56.3	30 - 130		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1
13C2-PFTeDA	IS	37.6	20 - 150		B8K0069	13-Nov-18	0.225 L	15-Nov-18 04:21	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: Method Blank

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc. Matrix: Solid

Project: Statewide WWTP Biosolids PFAS Evaluation

Laboratory Data

Lab Sample: B8K0188-BLK1 Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFPeA	2706-90-3	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFBS	375-73-5	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
4:2 FTS	757124-72-4	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFHxA	307-24-4	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFPeS	2706-91-4	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFHpA	375-85-9	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFHxS	355-46-4	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
6:2 FTS	27619-97-2	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFOA	335-67-1	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFHpS	375-92-8	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFNA	375-95-1	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFOSA	754-91-6	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFOS	1763-23-1	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFDA	335-76-2	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
8:2 FTS	39108-34-4	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFNS	68259-12-1	ND	1.43	1.50	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
MeFOSAA	2355-31-9	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
EtFOSAA	2991-50-6	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFUnA	2058-94-8	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFDS	335-77-3	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFDoA	307-55-1	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFTrDA	72629-94-8	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
PFTeDA	376-06-7	ND	0.845	1.00	2.00		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	67.3	60 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C3-PFPeA	IS	68.6	60 - 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C3-PFBS	IS	63.4	60 - 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C2-4:2 FTS	IS	59.1	40 - 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C2-PFHxA	IS	72.0	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C4-PFHpA	IS	74.2	60 - 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
18O2-PFHxS	IS	70.5	60 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C2-PFOA	IS	69.2	60 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C5-PFNA	IS	62.4	50 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C8-PFOSA	IS	36.8	20 - 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C8-PFOS	IS	65.4	60 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C2-PFDA	IS	57.2	60 - 130	H	B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C2-8:2 FTS	IS	55.4	40 - 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1

Sample ID: Method Blank

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Solid

Laboratory Data

Lab Sample: B8K0188-BLK1
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d3-MeFOSAA	IS	29.5	50 - 150	H	B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
d5-EtFOSAA	IS	29.8	50 - 150	H	B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C2-PFUnA	IS	46.9	60 - 130	H	B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C2-PFDoA	IS	35.0	30 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1
13C2-PFTeDA	IS	28.6	20 - 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:46	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: OPR **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Solid

Laboratory Data

Lab Sample: B8K0188-BS1
Column: BEH C18

Analyte	CAS Number	Amt Found (ng/g)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	10.9	10.0	109	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFPeA	2706-90-3	11.1	10.0	111	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFBS	375-73-5	11.3	10.0	113	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
4:2 FTS	757124-72-4	11.2	10.0	112	60 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFHxA	307-24-4	11.3	10.0	113	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFPeS	2706-91-4	11.3	10.0	113	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFHpA	375-85-9	11.1	10.0	111	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFHxS	355-46-4	11.0	10.0	110	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
6:2 FTS	27619-97-2	12.8	10.0	128	60 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFOA	335-67-1	11.4	10.0	114	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFHpS	375-92-8	11.3	10.0	113	60 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFNA	375-95-1	10.9	10.0	109	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFOSA	754-91-6	11.1	10.0	111	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFOS	1763-23-1	10.1	10.0	101	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFDA	335-76-2	10.9	10.0	109	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
8:2 FTS	39108-34-4	12.8	10.0	128	60 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFNS	68259-12-1	8.89	10.0	88.9	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
MeFOSAA	2355-31-9	10.5	10.0	105	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
EtFOSAA	2991-50-6	9.16	10.0	91.6	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFUnA	2058-94-8	11.6	10.0	116	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFDS	335-77-3	6.40	10.0	64.0	60 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFDoA	307-55-1	12.1	10.0	121	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFTrDA	72629-94-8	9.78	10.0	97.8	60 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
PFTeDA	376-06-7	11.4	10.0	114	70 - 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	73.4	60- 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
13C3-PFPeA	IS	73.4	60- 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
13C3-PFBS	IS	71.6	60- 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
13C2-4:2 FTS	IS	69.4	40- 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
13C2-PFHxA	IS	72.7	70- 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
13C4-PFHpA	IS	73.1	60- 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
18O2-PFHxS	IS	74.6	60- 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
13C2-PFOA	IS	68.4	60- 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
13C5-PFNA	IS	65.6	50- 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
13C8-PFOSA	IS	38.1	20- 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1

Sample ID: OPR **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Matrix: Solid

Laboratory Data

Lab Sample: B8K0188-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOS	IS	74.6	60- 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
13C2-PFDA	IS	61.8	60- 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
13C2-8:2 FTS	IS	58.1	40- 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
d3-MeFOSAA	IS	31.1	50- 150	H	B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
d5-EtFOSAA	IS	33.5	50- 150	H	B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
13C2-PFUnA	IS	47.5	60- 130	H	B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
13C2-PFDoA	IS	36.3	30- 130		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1
13C2-PFTeDA	IS	30.2	20- 150		B8K0188	27-Nov-18	1.00 g	29-Nov-18 22:36	1

Sample ID: BS1810311445GC

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Statewide WWTP Biosolids PFAS Evaluation
Location: BRON-MI0020729-STAND
Matrix: Biosolid
Date Collected: 31-Oct-18 14:45

Laboratory Data

Lab Sample: 1803576-03
Date Received: 09-Nov-18 09:41
% Solids: 3.40
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	1.66	0.829	0.981	1.96	J	B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFPeA	2706-90-3	4.07	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFBS	375-73-5	1.32	0.829	0.981	1.96	J	B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
4:2 FTS	757124-72-4	ND	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFHxA	307-24-4	7.91	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFPeS	2706-91-4	ND	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFHpA	375-85-9	0.885	0.829	0.981	1.96	J	B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFHxS	355-46-4	ND	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
6:2 FTS	27619-97-2	8.17	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFOA	335-67-1	3.86	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFHpS	375-92-8	ND	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFNA	375-95-1	1.18	0.829	0.981	1.96	J	B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFOSA	754-91-6	5.03	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFOS	1763-23-1	1060	4.14	4.90	9.81	D	B8K0188	27-Nov-18	30.0 g	30-Nov-18 11:04	5
PFDA	335-76-2	13.3	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
8:2 FTS	39108-34-4	3.21	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFNS	68259-12-1	ND	1.40	1.47	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
MeFOSAA	2355-31-9	24.7	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
EtFOSAA	2991-50-6	8.26	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFUnA	2058-94-8	1.97	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFDS	335-77-3	17.6	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFDoA	307-55-1	7.97	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFTrDA	72629-94-8	ND	0.829	0.981	1.96		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
PFTeDA	376-06-7	1.94	0.829	0.981	1.96	J	B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	18.3	60 - 130	H	B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
13C3-PFPeA	IS	64.6	60 - 150		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
13C3-PFBS	IS	72.0	60 - 150		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
13C2-4:2 FTS	IS	60.4	40 - 150		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
13C2-PFHxA	IS	66.5	70 - 130	H	B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
13C4-PFHpA	IS	68.4	60 - 150		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
18O2-PFHxS	IS	72.0	60 - 130		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
13C2-PFOA	IS	65.5	60 - 130		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
13C5-PFNA	IS	65.0	50 - 130		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
13C8-PFOSA	IS	40.8	20 - 150		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
13C8-PFOS	IS	58.5	60 - 130	D, H	B8K0188	27-Nov-18	30.0 g	30-Nov-18 11:04	5
13C2-PFDA	IS	62.8	60 - 130		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
13C2-8:2 FTS	IS	83.2	40 - 150		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1

Sample ID: BS1810311445GC

VAL - PFAS

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Biosolid
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	31-Oct-18 14:45
Location:	BRON-MI0020729-STAND		

Laboratory Data

Lab Sample:	1803576-03	Column:	BEH C18
Date Received:	09-Nov-18 09:41		
% Solids:	3.40		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d3-MeFOSAA	IS	47.2	50 - 150	H	B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
d5-EtFOSAA	IS	46.4	50 - 150	H	B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
13C2-PFUnA	IS	44.8	60 - 130	H	B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
13C2-PFDoA	IS	30.5	30 - 130		B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1
13C2-PFTeDA	IS	10.2	20 - 150	H	B8K0188	27-Nov-18	30.0 g	29-Nov-18 23:29	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	**This compound was also detected in the method blank**
Conc.	**Concentration**
D	**Dilution**
DL	**Detection limit**
E	**The associated compound concentration exceeded the calibration range of the instrument**
H	**Recovery and/or RPD was outside laboratory acceptance limits**
I	**Chemical Interference**
J	**The amount detected is below the Reporting Limit/LOQ**
LOD	**Limits of Detection**
LOQ	**Limits of Quantitation**
M	**Estimated Maximum Possible Concentration (CA Region 2 projects only)**
NA	**Not applicable**
ND	**Not Detected**
Q	**Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)**
TEQ	**Toxic Equivalency**
U	**Not Detected (specific projects only)**
*****	**See Cover Letter**

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	18-008-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207718
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-009
Pennsylvania Department of Environmental Protection	015
Texas Commission on Environmental Quality	T104704189-18-9
Virginia Department of General Services	9618
Washington Department of Ecology	C584-18
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

Revised COC - rec'd via client email 11/26/18 JN

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1803576 Temp: °C
Storage ID: Storage Secured: Yes ☐ No ☐

Project ID: **Statewide WWTP Biosolids PFAS Evaluation** PO#: **60588767.01** Sampler: **Garth Cousineau** (name)

TAT (check one): Standard: [x] 21 days; Rush (surcharge may apply): [ ] 14 days [ ] 7 days Specify:

Invoice to: Name	Company	Address	City	State	Ph#	Fax#
Stephanie Kammer	**MDEQ**	**525 W. Allegan Street**	**Lansing**	**MI**	**517-897-1597**	**517-241-3571**

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Dorin Bogdan Dorin Bogdan	**11/20/2018**	**17:00**			
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment:

Tracking No.:

Add Analysis(es) Requested

Container(s) | PFAS isotope Dilution | USEPA Method 537

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	PFOA/ PFOS	UCMR3 PFAS List6	PFAS List: 14	Comments
WW1810311430GC	**10/31/18**	**1430**	**BRON-MI0020729-EFPT1**	**2**	**P**	**WW**			**X**							**Effluet**
WW1810311500GC	**10/31/18**	**1500**	**BRON-MI0020729-IFPT1**	**2**	**P**	**WW**			**X**							**Influent**
BS1810311445GC	**10/31/18**	**1445**	**BRON-MI0020729-STAND**	**2**	**P**	**BS**			**X**							**Stabiliezed Anaerobic**

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street, Constitution Hall, 1st South West**
City: **Lansing** State: **MI** Zip: **30242**
Phone: **517-897-1597** Fax: **517-241-3571**
Email: dorin.bogdan@aecom.com

Container Types: P= HDPE, PJ= HDPE Jar
O = Other:

Bottle Preservation Type: T = Thiosulfate,
TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, BS=Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1803576 Temp: 1.1 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: **Statewide WWTP Biosolids PFAS Evaluation** PO#: **60588767.01** Sampler: **Garth Cousineau** (name)

TAT (check one): Standard: x 21 days; Rush (surcharge may apply): ☐ 14 days ☐ 7 days Specify:

Invoice to: Name	Company	Address	City	State	Ph#	Fax#
Stephanie Kammer	**MDEQ**	**525 W. Allegan Street**	**Lansing**	**MI**	**517-897-1597**	**517-241-3571**

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Dorin Bogdan Dorin Bogdan	**11/6/2018**	**17:00**	B. Benedict Brittany Benedict	11/09/18	0941
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment:

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s): Quantity	Type	Matrix	PFAS Isotope Dilution: List of 21	List of 21 w/isomers	List of 24	List of 24 w/isomers	List of 28	Other: Please List Below	USEPA Method 537: PFOA/ PFOS	UCMR3 PFAS List 6	PFAS List 14	Comments
WW1810311430GC	10/31/18	1430	BRON-MI0020729-EFPLT	2	P	WW			X							Effluet
WW1810311500GC	10/31/18	1500	BRON-MI0020729-IFPLT	2	P	WW			X							Influent
BS1810311445GC	10/31/18	1445	BRON-MI0020729-STAND	2	P	BS			X							Stabiliezed Anaerobic

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street, Constitution Hall, 1st South West**
City: **Lansing** State: **MI** Zip: **30242**
Phone: **517-897-1597** Fax: **517-241-3571**
Email: **dorin.bogdan@aecom.com**

Container Types: P= HDPE, PJ= HDPE Jar, O = Other:

Bottle Preservation Type: T = Thiosulfate, TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, BS=Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 1803576 TAT std

Samples Arrival:	**Date/Time** 11/09/18 0941	**Initials:** RBB	**Location:** WR-2 **Shelf/Rack:** NA
Logged In:	**Date/Time** 11/09/18 1042	**Initials:** MWS	**Location:** WR-2 **Shelf/Rack:** a-3, F-4, a-5

Delivered By:	(FedEx)	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	Ice		Blue Ice		Dry Ice		None

Temp °C: 1.2 (uncorrected)	**Probe used: Y / (N)**	**Thermometer ID:** IR-4
Temp °C: 1.1 (corrected)		

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		✓
Shipping Custody Seals Intact?			✓
Shipping Documentation Present?	✓		
Airbill Trk # 4377 0528 7280	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?		✓	✓

If Chlorinated or Drinking Water Samples, Acceptable Preservation?						✓
Preservation Documented:	$Na_2S_2O_3$ Trizma None Other				Yes	No (NA)
Shipping Container	Vista	(Client)	Retain	(Return)	Dispose	

Comments:

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Edison
777 New Durham Road
Edison, NJ 08817
Tel: (732)549-3900

Laboratory Job ID: 460-179559-1
Client Project/Site: Statewide WWTP Biosolids

For:
Michigan Dept of Environmental Quality
Water Resources Division
Constitution Hall, 3rd Fl SW
525 W. Allegan Street
Lansing, Michigan 48909

Attn: Stephanie Kammer

Kris Brooks

Authorized for release by:
4/30/2019 4:04:20 PM

Kris Brooks, Project Manager II
(330)966-9790
kris.brooks@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

Table of Contents

Definitions/Glossary

Client: Michigan Dept of Environmental Quality
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 460-179559-1

Laboratory: Eurofins TestAmerica, Edison

Narrative

CASE NARRATIVE

Client: Michigan Dept of Environmental Quality

Project: Statewide WWTP Biosolids

Report Number: 460-179559-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, Edison attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 4/11/2019 9:13 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1º C.

TOTAL ORGANIC CARBON

Samples SXDU11904081125RL (460-179559-1), SXDU21904081210RL (460-179559-2), SXDU31904081300RL (460-179559-3), SXDU41904081450RL (460-179559-4), SXDU11904081700RL (460-179559-5), SXDU21904081755RL (460-179559-6), SXDU11904081825RL (460-179559-7), SXDU21904081910RL (460-179559-8), SXDU11904091050MK (460-179559-9), SXDU21904091155MK (460-179559-10), SXDU21904091300MK (460-179559-11), SXDU11904091350MK (460-179559-12), SXDU11904101005RL (460-179559-13), SXDU21904101050RL (460-179559-14), SXDU31904101120RL (460-179559-15), SXDU11904101300RL (460-179559-16), SXDU21904101330RL (460-179559-17), SXDU31904101355RL (460-179559-18), SXDU21904101505RL (460-179559-19) and SXDU11904101540RL (460-179559-20) were analyzed for total organic carbon in accordance with Lloyd Kahn Method. The samples were analyzed on 04/18/2019 and 04/23/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS

Samples SXDU11904081125RL (460-179559-1), SXDU21904081210RL (460-179559-2), SXDU31904081300RL (460-179559-3),

Job ID: 460-179559-1 (Continued)

Laboratory: Eurofins TestAmerica, Edison (Continued)

SXDU41904081450RL (460-179559-4), SXDU11904081700RL (460-179559-5), SXDU21904081755RL (460-179559-6), SXDU11904081825RL (460-179559-7), SXDU21904081910RL (460-179559-8), SXDU11904091050MK (460-179559-9), SXDU21904091155MK (460-179559-10), SXDU21904091300MK (460-179559-11), SXDU11904091350MK (460-179559-12), SXDU11904101005RL (460-179559-13), SXDU21904101050RL (460-179559-14), SXDU31904101120RL (460-179559-15), SXDU11904101300RL (460-179559-16), SXDU21904101330RL (460-179559-17), SXDU31904101355RL (460-179559-18), SXDU21904101505RL (460-179559-19) and SXDU11904101540RL (460-179559-20) were analyzed for percent solids in accordance with ASTM Method D2216-80. The samples were analyzed on 04/27/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Michigan Dept of Environmental Quality
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

Client Sample ID: SXDU11904081125RL — Lab Sample ID: 460-179559-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	13000		120	80	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU21904081210RL — Lab Sample ID: 460-179559-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	29000		130	87	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU31904081300RL — Lab Sample ID: 460-179559-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	19000		120	85	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU41904081450RL — Lab Sample ID: 460-179559-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	13000		120	81	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU11904081700RL — Lab Sample ID: 460-179559-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	6500		120	80	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU21904081755RL — Lab Sample ID: 460-179559-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	6800		120	81	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU11904081825RL — Lab Sample ID: 460-179559-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	13000		120	81	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU21904081910RL — Lab Sample ID: 460-179559-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	8100		110	79	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU11904091050MK — Lab Sample ID: 460-179559-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	18000		120	84	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU21904091155MK — Lab Sample ID: 460-179559-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	18000		120	83	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU21904091300MK — Lab Sample ID: 460-179559-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	17000		120	82	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU11904091350MK — Lab Sample ID: 460-179559-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	100000		140	95	mg/Kg	1	☼	Lloyd Kahn	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Michigan Dept of Environmental Quality
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

Client Sample ID: SXDU11904101005RL — Lab Sample ID: 460-179559-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	9300		120	79	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU21904101050RL — Lab Sample ID: 460-179559-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	8600		120	79	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU31904101120RL — Lab Sample ID: 460-179559-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	49000		130	89	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU11904101300RL — Lab Sample ID: 460-179559-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	8100		120	84	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU21904101330RL — Lab Sample ID: 460-179559-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	43000		130	88	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU31904101355RL — Lab Sample ID: 460-179559-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	11000		110	78	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU21904101505RL — Lab Sample ID: 460-179559-19

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	7600		120	79	mg/Kg	1	☼	Lloyd Kahn	Total/NA

Client Sample ID: SXDU11904101540RL — Lab Sample ID: 460-179559-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOC Result 1	10000		120	81	mg/Kg	1	☼	Lloyd Kahn	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: SXDU11904081125RL
Lab Sample ID: 460-179559-1
Date Collected: 04/08/19 11:25
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	14.7		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	85.3		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU11904081125RL
Lab Sample ID: 460-179559-1
Date Collected: 04/08/19 11:25
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 85.3

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	13000		120	80	mg/Kg	☼		04/18/19 14:13	1

Client Sample ID: SXDU21904081210RL
Lab Sample ID: 460-179559-2
Date Collected: 04/08/19 12:10
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	21.1		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	78.9		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU21904081210RL
Lab Sample ID: 460-179559-2
Date Collected: 04/08/19 12:10
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 78.9

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	29000		130	87	mg/Kg	☼		04/18/19 15:27	1

Client Sample ID: SXDU31904081300RL
Lab Sample ID: 460-179559-3
Date Collected: 04/08/19 13:00
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	19.3		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	80.7		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU31904081300RL
Lab Sample ID: 460-179559-3
Date Collected: 04/08/19 13:00
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 80.7

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	19000		120	85	mg/Kg	☼		04/18/19 15:36	1

Client Sample ID: SXDU41904081450RL
Lab Sample ID: 460-179559-4
Date Collected: 04/08/19 14:50
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	15.2		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU41904081450RL
Lab Sample ID: 460-179559-4
Date Collected: 04/08/19 14:50
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	84.8		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU41904081450RL
Lab Sample ID: 460-179559-4
Date Collected: 04/08/19 14:50
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 84.8

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	13000		120	81	mg/Kg	☼		04/18/19 15:44	1

Client Sample ID: SXDU11904081700RL
Lab Sample ID: 460-179559-5
Date Collected: 04/08/19 17:00
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	14.6		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	85.4		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU11904081700RL
Lab Sample ID: 460-179559-5
Date Collected: 04/08/19 17:00
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 85.4

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	6500		120	80	mg/Kg	☼		04/18/19 15:51	1

Client Sample ID: SXDU21904081755RL
Lab Sample ID: 460-179559-6
Date Collected: 04/08/19 17:55
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	15.5		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	84.5		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU21904081755RL
Lab Sample ID: 460-179559-6
Date Collected: 04/08/19 17:55
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 84.5

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	6800		120	81	mg/Kg	☼		04/18/19 16:14	1

Client Sample ID: SXDU11904081825RL
Lab Sample ID: 460-179559-7
Date Collected: 04/08/19 18:25
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	15.7		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	84.3		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU11904081825RL

Lab Sample ID: 460-179559-7
Date Collected: 04/08/19 18:25
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 84.3

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	13000		120	81	mg/Kg	☼		04/18/19 16:22	1

Client Sample ID: SXDU21904081910RL

Lab Sample ID: 460-179559-8
Date Collected: 04/08/19 19:10
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	13.0		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	87.0		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU21904081910RL

Lab Sample ID: 460-179559-8
Date Collected: 04/08/19 19:10
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 87.0

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	8100		110	79	mg/Kg	☼		04/18/19 16:30	1

Client Sample ID: SXDU11904091050MK

Lab Sample ID: 460-179559-9
Date Collected: 04/09/19 10:50
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	18.9		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	81.1		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU11904091050MK

Lab Sample ID: 460-179559-9
Date Collected: 04/09/19 10:50
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 81.1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	18000		120	84	mg/Kg	☼		04/18/19 16:37	1

Client Sample ID: SXDU21904091155MK

Lab Sample ID: 460-179559-10
Date Collected: 04/09/19 11:55
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	17.7		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	82.3		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU21904091155MK

Lab Sample ID: 460-179559-10
Date Collected: 04/09/19 11:55
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 82.3

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	18000		120	83	mg/Kg	☼		04/18/19 16:45	1

Client Sample ID: SXDU21904091300MK
Lab Sample ID: 460-179559-11
Date Collected: 04/09/19 13:00
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	16.3		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	83.7		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU21904091300MK
Lab Sample ID: 460-179559-11
Date Collected: 04/09/19 13:00
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 83.7

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	17000		120	82	mg/Kg	☼		04/18/19 16:52	1

Client Sample ID: SXDU11904091350MK
Lab Sample ID: 460-179559-12
Date Collected: 04/09/19 13:50
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	27.6		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	72.4		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU11904091350MK
Lab Sample ID: 460-179559-12
Date Collected: 04/09/19 13:50
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 72.4

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	100000		140	95	mg/Kg	☼		04/18/19 17:00	1

Client Sample ID: SXDU11904101005RL
Lab Sample ID: 460-179559-13
Date Collected: 04/10/19 10:05
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	13.3		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	86.7		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU11904101005RL
Lab Sample ID: 460-179559-13
Date Collected: 04/10/19 10:05
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 86.7

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	9300		120	79	mg/Kg	☼		04/23/19 13:09	1

Client Sample ID: SXDU21904101050RL
Lab Sample ID: 460-179559-14
Date Collected: 04/10/19 10:50
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	13.7		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU21904101050RL
Lab Sample ID: 460-179559-14
Date Collected: 04/10/19 10:50
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	86.3		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU21904101050RL
Lab Sample ID: 460-179559-14
Date Collected: 04/10/19 10:50
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 86.3

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	8600		120	79	mg/Kg	☼		04/23/19 13:42	1

Client Sample ID: SXDU31904101120RL
Lab Sample ID: 460-179559-15
Date Collected: 04/10/19 11:20
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	23.2		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	76.8		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU31904101120RL
Lab Sample ID: 460-179559-15
Date Collected: 04/10/19 11:20
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 76.8

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	49000		130	89	mg/Kg	☼		04/23/19 13:50	1

Client Sample ID: SXDU11904101300RL
Lab Sample ID: 460-179559-16
Date Collected: 04/10/19 13:00
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	18.3		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	81.7		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU11904101300RL
Lab Sample ID: 460-179559-16
Date Collected: 04/10/19 13:00
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 81.7

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	8100		120	84	mg/Kg	☼		04/23/19 13:57	1

Client Sample ID: SXDU21904101330RL
Lab Sample ID: 460-179559-17
Date Collected: 04/10/19 13:30
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	22.1		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	77.9		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU21904101330RL

Lab Sample ID: 460-179559-17
Date Collected: 04/10/19 13:30
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 77.9

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	43000		130	88	mg/Kg	☼		04/23/19 14:05	1

Client Sample ID: SXDU31904101355RL

Lab Sample ID: 460-179559-18
Date Collected: 04/10/19 13:55
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	12.3		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	87.7		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU31904101355RL

Lab Sample ID: 460-179559-18
Date Collected: 04/10/19 13:55
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 87.7

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	11000		110	78	mg/Kg	☼		04/23/19 14:29	1

Client Sample ID: SXDU21904101505RL

Lab Sample ID: 460-179559-19
Date Collected: 04/10/19 15:05
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	13.7		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	86.3		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU21904101505RL

Lab Sample ID: 460-179559-19
Date Collected: 04/10/19 15:05
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 86.3

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	7600		120	79	mg/Kg	☼		04/23/19 14:36	1

Client Sample ID: SXDU11904101540RL

Lab Sample ID: 460-179559-20
Date Collected: 04/10/19 15:40
Matrix: Solid
Date Received: 04/11/19 09:13

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	15.0		1.0	1.0	%			04/27/19 05:15	1
Percent Solids	85.0		1.0	1.0	%			04/27/19 05:15	1

Client Sample ID: SXDU11904101540RL

Lab Sample ID: 460-179559-20
Date Collected: 04/10/19 15:40
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 85.0

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	10000		120	81	mg/Kg	☼		04/23/19 14:44	1

Method: Lloyd Kahn - Organic Carbon, Total (TOC)

Lab Sample ID: MB 460-603657/3
Matrix: Solid
Analysis Batch: 603657

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	ND		100	69	mg/Kg			04/18/19 13:51	1

Lab Sample ID: LCSSRM 460-603657/4
Matrix: Solid
Analysis Batch: 603657

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
TOC Result 1			13800	14200		mg/Kg		102.8	34.9 - 192.8		

Lab Sample ID: MB 460-604732/3
Matrix: Solid
Analysis Batch: 604732

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	ND		100	69	mg/Kg			04/23/19 12:50	1

Lab Sample ID: LCSSRM 460-604732/4
Matrix: Solid
Analysis Batch: 604732

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
TOC Result 1			13800	14200		mg/Kg		102.9	34.9 - 192.8		

Method: Moisture - Percent Moisture

Lab Sample ID: 460-179559-16 DU
Matrix: Solid
Analysis Batch: 605732

Client Sample ID: SXDU11904101300RL
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	18.3			17.8		%				2	20
Percent Solids	81.7			82.2		%				0.5	20

General Chemistry

Analysis Batch: 603657

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-179559-1	SXDU11904081125RL	Total/NA	Solid	Lloyd Kahn	
460-179559-2	SXDU21904081210RL	Total/NA	Solid	Lloyd Kahn	
460-179559-3	SXDU31904081300RL	Total/NA	Solid	Lloyd Kahn	
460-179559-4	SXDU41904081450RL	Total/NA	Solid	Lloyd Kahn	
460-179559-5	SXDU11904081700RL	Total/NA	Solid	Lloyd Kahn	
460-179559-6	SXDU21904081755RL	Total/NA	Solid	Lloyd Kahn	
460-179559-7	SXDU11904081825RL	Total/NA	Solid	Lloyd Kahn	
460-179559-8	SXDU21904081910RL	Total/NA	Solid	Lloyd Kahn	
460-179559-9	SXDU11904091050MK	Total/NA	Solid	Lloyd Kahn	
460-179559-10	SXDU21904091155MK	Total/NA	Solid	Lloyd Kahn	
460-179559-11	SXDU21904091300MK	Total/NA	Solid	Lloyd Kahn	
460-179559-12	SXDU11904091350MK	Total/NA	Solid	Lloyd Kahn	
MB 460-603657/3	Method Blank	Total/NA	Solid	Lloyd Kahn	
LCSSRM 460-603657/4	Lab Control Sample	Total/NA	Solid	Lloyd Kahn	

Analysis Batch: 604732

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-179559-13	SXDU11904101005RL	Total/NA	Solid	Lloyd Kahn	
460-179559-14	SXDU21904101050RL	Total/NA	Solid	Lloyd Kahn	
460-179559-15	SXDU31904101120RL	Total/NA	Solid	Lloyd Kahn	
460-179559-16	SXDU11904101300RL	Total/NA	Solid	Lloyd Kahn	
460-179559-17	SXDU21904101330RL	Total/NA	Solid	Lloyd Kahn	
460-179559-18	SXDU31904101355RL	Total/NA	Solid	Lloyd Kahn	
460-179559-19	SXDU21904101505RL	Total/NA	Solid	Lloyd Kahn	
460-179559-20	SXDU11904101540RL	Total/NA	Solid	Lloyd Kahn	
MB 460-604732/3	Method Blank	Total/NA	Solid	Lloyd Kahn	
LCSSRM 460-604732/4	Lab Control Sample	Total/NA	Solid	Lloyd Kahn	

Analysis Batch: 605732

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-179559-1	SXDU11904081125RL	Total/NA	Solid	Moisture	
460-179559-2	SXDU21904081210RL	Total/NA	Solid	Moisture	
460-179559-3	SXDU31904081300RL	Total/NA	Solid	Moisture	
460-179559-4	SXDU41904081450RL	Total/NA	Solid	Moisture	
460-179559-5	SXDU11904081700RL	Total/NA	Solid	Moisture	
460-179559-6	SXDU21904081755RL	Total/NA	Solid	Moisture	
460-179559-7	SXDU11904081825RL	Total/NA	Solid	Moisture	
460-179559-8	SXDU21904081910RL	Total/NA	Solid	Moisture	
460-179559-9	SXDU11904091050MK	Total/NA	Solid	Moisture	
460-179559-10	SXDU21904091155MK	Total/NA	Solid	Moisture	
460-179559-11	SXDU21904091300MK	Total/NA	Solid	Moisture	
460-179559-12	SXDU11904091350MK	Total/NA	Solid	Moisture	
460-179559-13	SXDU11904101005RL	Total/NA	Solid	Moisture	
460-179559-14	SXDU21904101050RL	Total/NA	Solid	Moisture	
460-179559-15	SXDU31904101120RL	Total/NA	Solid	Moisture	
460-179559-16	SXDU11904101300RL	Total/NA	Solid	Moisture	
460-179559-17	SXDU21904101330RL	Total/NA	Solid	Moisture	
460-179559-18	SXDU31904101355RL	Total/NA	Solid	Moisture	
460-179559-19	SXDU21904101505RL	Total/NA	Solid	Moisture	
460-179559-20	SXDU11904101540RL	Total/NA	Solid	Moisture	
460-179559-16 DU	SXDU11904101300RL	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Michigan Dept of Environmental Quality
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

Client Sample ID: SXDU11904081125RL — **Lab Sample ID: 460-179559-1**
Date Collected: 04/08/19 11:25 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU11904081125RL — **Lab Sample ID: 460-179559-1**
Date Collected: 04/08/19 11:25 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 85.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	603657	04/18/19 14:13	AJP	TAL EDI

Client Sample ID: SXDU21904081210RL — **Lab Sample ID: 460-179559-2**
Date Collected: 04/08/19 12:10 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU21904081210RL — **Lab Sample ID: 460-179559-2**
Date Collected: 04/08/19 12:10 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 78.9**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	603657	04/18/19 15:27	AJP	TAL EDI

Client Sample ID: SXDU31904081300RL — **Lab Sample ID: 460-179559-3**
Date Collected: 04/08/19 13:00 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU31904081300RL — **Lab Sample ID: 460-179559-3**
Date Collected: 04/08/19 13:00 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 80.7**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	603657	04/18/19 15:36	AJP	TAL EDI

Client Sample ID: SXDU41904081450RL — **Lab Sample ID: 460-179559-4**
Date Collected: 04/08/19 14:50 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Lab Chronicle

Client: Michigan Dept of Environmental Quality
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

Client Sample ID: SXDU41904081450RL — **Lab Sample ID: 460-179559-4**
Date Collected: 04/08/19 14:50 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 84.8**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	603657	04/18/19 15:44	AJP	TAL EDI

Client Sample ID: SXDU11904081700RL — **Lab Sample ID: 460-179559-5**
Date Collected: 04/08/19 17:00 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU11904081700RL — **Lab Sample ID: 460-179559-5**
Date Collected: 04/08/19 17:00 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 85.4**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	603657	04/18/19 15:51	AJP	TAL EDI

Client Sample ID: SXDU21904081755RL — **Lab Sample ID: 460-179559-6**
Date Collected: 04/08/19 17:55 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU21904081755RL — **Lab Sample ID: 460-179559-6**
Date Collected: 04/08/19 17:55 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 84.5**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	603657	04/18/19 16:14	AJP	TAL EDI

Client Sample ID: SXDU11904081825RL — **Lab Sample ID: 460-179559-7**
Date Collected: 04/08/19 18:25 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU11904081825RL — **Lab Sample ID: 460-179559-7**
Date Collected: 04/08/19 18:25 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 84.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	603657	04/18/19 16:22	AJP	TAL EDI

Lab Chronicle

Client: Michigan Dept of Environmental Quality
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

Client Sample ID: SXDU21904081910RL — **Lab Sample ID: 460-179559-8**
Date Collected: 04/08/19 19:10 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU21904081910RL — **Lab Sample ID: 460-179559-8**
Date Collected: 04/08/19 19:10 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 87.0**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	603657	04/18/19 16:30	AJP	TAL EDI

Client Sample ID: SXDU11904091050MK — **Lab Sample ID: 460-179559-9**
Date Collected: 04/09/19 10:50 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU11904091050MK — **Lab Sample ID: 460-179559-9**
Date Collected: 04/09/19 10:50 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 81.1**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	603657	04/18/19 16:37	AJP	TAL EDI

Client Sample ID: SXDU21904091155MK — **Lab Sample ID: 460-179559-10**
Date Collected: 04/09/19 11:55 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU21904091155MK — **Lab Sample ID: 460-179559-10**
Date Collected: 04/09/19 11:55 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 82.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	603657	04/18/19 16:45	AJP	TAL EDI

Client Sample ID: SXDU21904091300MK — **Lab Sample ID: 460-179559-11**
Date Collected: 04/09/19 13:00 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Lab Chronicle

Client: Michigan Dept of Environmental Quality
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

Client Sample ID: SXDU21904091300MK — **Lab Sample ID: 460-179559-11**
Date Collected: 04/09/19 13:00 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 83.7**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	603657	04/18/19 16:52	AJP	TAL EDI

Client Sample ID: SXDU11904091350MK — **Lab Sample ID: 460-179559-12**
Date Collected: 04/09/19 13:50 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU11904091350MK — **Lab Sample ID: 460-179559-12**
Date Collected: 04/09/19 13:50 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 72.4**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	603657	04/18/19 17:00	AJP	TAL EDI

Client Sample ID: SXDU11904101005RL — **Lab Sample ID: 460-179559-13**
Date Collected: 04/10/19 10:05 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU11904101005RL — **Lab Sample ID: 460-179559-13**
Date Collected: 04/10/19 10:05 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 86.7**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	604732	04/23/19 13:09	AJP	TAL EDI

Client Sample ID: SXDU21904101050RL — **Lab Sample ID: 460-179559-14**
Date Collected: 04/10/19 10:50 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU21904101050RL — **Lab Sample ID: 460-179559-14**
Date Collected: 04/10/19 10:50 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 86.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	604732	04/23/19 13:42	AJP	TAL EDI

Lab Chronicle

Client: Michigan Dept of Environmental Quality
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

Client Sample ID: SXDU31904101120RL — **Lab Sample ID: 460-179559-15**
Date Collected: 04/10/19 11:20 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU31904101120RL — **Lab Sample ID: 460-179559-15**
Date Collected: 04/10/19 11:20 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 76.8**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	604732	04/23/19 13:50	AJP	TAL EDI

Client Sample ID: SXDU11904101300RL — **Lab Sample ID: 460-179559-16**
Date Collected: 04/10/19 13:00 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU11904101300RL — **Lab Sample ID: 460-179559-16**
Date Collected: 04/10/19 13:00 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 81.7**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	604732	04/23/19 13:57	AJP	TAL EDI

Client Sample ID: SXDU21904101330RL — **Lab Sample ID: 460-179559-17**
Date Collected: 04/10/19 13:30 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU21904101330RL — **Lab Sample ID: 460-179559-17**
Date Collected: 04/10/19 13:30 — **Matrix: Solid**
Date Received: 04/11/19 09:13 — **Percent Solids: 77.9**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	604732	04/23/19 14:05	AJP	TAL EDI

Client Sample ID: SXDU31904101355RL — **Lab Sample ID: 460-179559-18**
Date Collected: 04/10/19 13:55 — **Matrix: Solid**
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Lab Chronicle

Client: Michigan Dept of Environmental Quality
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

Client Sample ID: SXDU31904101355RL
Lab Sample ID: 460-179559-18
Date Collected: 04/10/19 13:55
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 87.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	604732	04/23/19 14:29	AJP	TAL EDI

Client Sample ID: SXDU21904101505RL
Lab Sample ID: 460-179559-19
Date Collected: 04/10/19 15:05
Matrix: Solid
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU21904101505RL
Lab Sample ID: 460-179559-19
Date Collected: 04/10/19 15:05
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 86.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	604732	04/23/19 14:36	AJP	TAL EDI

Client Sample ID: SXDU11904101540RL
Lab Sample ID: 460-179559-20
Date Collected: 04/10/19 15:40
Matrix: Solid
Date Received: 04/11/19 09:13

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	605732	04/27/19 05:15	APV	TAL EDI

Client Sample ID: SXDU11904101540RL
Lab Sample ID: 460-179559-20
Date Collected: 04/10/19 15:40
Matrix: Solid
Date Received: 04/11/19 09:13
Percent Solids: 85.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	604732	04/23/19 14:44	AJP	TAL EDI

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

Accreditation/Certification Summary

Client: Michigan Dept of Environmental Quality
Job ID: 460-179559-1
Project/Site: Statewide WWTP Biosolids

Laboratory: Eurofins TestAmerica, Edison

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Connecticut	State Program	1	PH-0200	09-30-20
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	N/A	12-31-19
New Jersey	NELAP	2	12028	06-30-19
New York	NELAP	2	11452	04-01-20
Pennsylvania	NELAP	3	68-00522	02-28-20
Rhode Island	State Program	1	LAO00132	12-30-19
USDA	Federal		NJCA-003-08	05-03-21

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-20
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	04-30-19 *
Kentucky (UST)	State Program	4	58	02-23-20
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-20
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-20
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-20 *
West Virginia DEP	State Program	3	210	12-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Michigan Dept of Environmental Quality
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

Method	Method Description	Protocol	Laboratory
Lloyd Kahn	Organic Carbon, Total (TOC)	EPA	TAL EDI
Moisture	Percent Moisture	EPA	TAL EDI

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

Sample Summary

Client: Michigan Dept of Environmental Quality
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
460-179559-1	SXDU11904081125RL	Solid	04/08/19 11:25	04/11/19 09:13
460-179559-2	SXDU21904081210RL	Solid	04/08/19 12:10	04/11/19 09:13
460-179559-3	SXDU31904081300RL	Solid	04/08/19 13:00	04/11/19 09:13
460-179559-4	SXDU41904081450RL	Solid	04/08/19 14:50	04/11/19 09:13
460-179559-5	SXDU11904081700RL	Solid	04/08/19 17:00	04/11/19 09:13
460-179559-6	SXDU21904081755RL	Solid	04/08/19 17:55	04/11/19 09:13
460-179559-7	SXDU11904081825RL	Solid	04/08/19 18:25	04/11/19 09:13
460-179559-8	SXDU21904081910RL	Solid	04/08/19 19:10	04/11/19 09:13
460-179559-9	SXDU11904091050MK	Solid	04/09/19 10:50	04/11/19 09:13
460-179559-10	SXDU21904091155MK	Solid	04/09/19 11:55	04/11/19 09:13
460-179559-11	SXDU21904091300MK	Solid	04/09/19 13:00	04/11/19 09:13
460-179559-12	SXDU11904091350MK	Solid	04/09/19 13:50	04/11/19 09:13
460-179559-13	SXDU11904101005RL	Solid	04/10/19 10:05	04/11/19 09:13
460-179559-14	SXDU21904101050RL	Solid	04/10/19 10:50	04/11/19 09:13
460-179559-15	SXDU31904101120RL	Solid	04/10/19 11:20	04/11/19 09:13
460-179559-16	SXDU11904101300RL	Solid	04/10/19 13:00	04/11/19 09:13
460-179559-17	SXDU21904101330RL	Solid	04/10/19 13:30	04/11/19 09:13
460-179559-18	SXDU31904101355RL	Solid	04/10/19 13:55	04/11/19 09:13
460-179559-19	SXDU21904101505RL	Solid	04/10/19 15:05	04/11/19 09:13
460-179559-20	SXDU11904101540RL	Solid	04/10/19 15:40	04/11/19 09:13

TestAmerica Edison
777 New Durham Road

Edison, NJ 08817-2859
phone 732.549.3900 fax 732.549.3679

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Dorin Bogdan	Site Contact:	Date:	COC No:
AECOM	Tel/Fax: (616) 516-5995	Lab Contact:	Carrier:	____ of ____ COCs
3950 Sparks Dr SE	**Analysis Turnaround Time**			Sampler:
Grand Rapids, MI 49546	☑ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
(616) 516-5995 PHONE	TAT if different from Below ____21____			Walk-in Client:
(xxx) xxx-xxxx FAX	☐ 2 weeks			Lab Sampling:
Project Name: Statewide WWTP Biosolids PFAS Evaluation	☐ 1 week			Job / SDG No.: 179559
Site: -	☐ 2 days			
P O # 60588767.01	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Sample Specific Notes:
SXDU11904081125RL	4/8/2019	1125	C	SO	1			TOC Analysis 1
SXDU21904081210RL	4/8/19	1210	C	SO	1			2
SXDU31904081300RL	4/8/19	1300	C	SO	1			3
SXDU41904081450RL	4/8/19	1450	C	SO	1			4
SXDU11904081700RL	4/8/19	1700	C	SO	1			5
SXDU21904081755RL	4/8/19	1755	C	SO	1			6
SXDU11904081825RL	4/8/19	1825	C	SO	1			7
SXDU21904081910RL	4/8/19	1910	C	SO	1			8
SXDU11904091050MK	4/9/19	1050	C	SO	1			9
SXDU21904091155MK	4/9/19	1155	C	SO	1			10
SXDU21904091300MK	4/9/19	1300	C	SO	1			11
SXDU11904091350MK	4/9/19	1350	C	SO	1			12

460-179559 Chain of Custody

Preservation Used: 1= Ice, 2= HCl, 3= H_2SO_4, 4= HNO_3, 5= NaOH, 6= Other

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments:

1.1°C IR#9

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: NO CS | Cooler Temp. (°C): Obs'd: ____ Corr'd: ____ | Therm ID No.: ____

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Michal Kascis	AECOM	4/10/19 1830	Received by: Angela Pinilla via FEDEX	TAEDISON	04/11/19 09:13
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.15, dated 9/27/2017

Page 25 of 28

4/30/2019

TestAmerica Edison
777 New Durham Road

Edison, NJ 08817-2859
phone 732.549.3900 fax 732.549.3679

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Dorin Bogdan	Site Contact:	Date:	COC No:
AECOM	Tel/Fax: (616) 516-5995	Lab Contact:	Carrier:	____ of ____ COCs
3950 Sparks Dr SE	Analysis Turnaround Time			Sampler:
Grand Rapids, MI 49546	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(616) 516-5995 PHONE	TAT if different from Below ___21___			Walk-in Client:
(xxx) xxx-xxxx FAX	☐ 2 weeks			Lab Sampling:
Project Name: Statewide WWTP Biosolids PFAS Evaluation	☐ 1 week			Job / SDG No.: 179559
Site: -	☐ 2 days			
P O # 60588767.01	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	Sample Specific Notes:
SXDU11904101005RL	4/10/2019	1005	C	SO	1			TOC Analysis 13
SXDU21904101050RL	4/10/19	1050	C	SO	1			14
SXDU31904101120RL	4/10/19	1120	C	SO	1			15
SXDU11904101300RL	4/10/19	1300	C	SO	1			16
SXDU21904101330RL	4/10/19	1330	C	SO	1			17
SXDU31904101355RL	4/10/19	1355	C	SO	1			18
SXDU21904101505RL	4/10/19	1505	C	SO	1			19
SXDU11904101540RL	4/10/19	1540	C	SO	1			20

Preservation Used: 1= Ice, 2= HCl, 3= H2SO4, 4= HNO3, 5= NaOH, 6= Other

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

1.1°C IR#9

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.: NO CS	Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ Therm ID No.:_____			
Relinquished by: Mich Kasc	Company: AECOM	Date/Time: 4/10/19 1830	Received by: Angela Pinilla	Company: TAEDison	Date/Time: 04/11/19 09:13
Relinquished by:	Company:	Date/Time:	Received by: via FEDEX	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.15, dated 9/27/2017

Page 26 of 28

4/24/2019

TestAmerica Edison
Receipt Temperature and pH Log

Page ____ of ____

Job Number: 179559

Number of Coolers: 2 IR Gun #: 9

Cooler Temperatures

Cooler #1: 4.1 / 4.1 °C	Cooler #4: ____ °C	Cooler #7: ____ °C	Cooler #10: ____ °C
Cooler #2: ____ °C	Cooler #5: ____ °C	Cooler #8: ____ °C	Cooler #11: ____ °C
Cooler #3: ____ °C	Cooler #6: ____ °C	Cooler #9: ____ °C	Cooler #12: ____ °C

TALS Sample Number	Ammonia (pH<2)	COD (pH<2)	Nitrate Nitrite (pH<2)	Metals* (pH<2)	Hardness (pH<2)	Pest (pH 5-9)	EPH or QAM (pH<2)	Phenols (pH<2)	Sulfide (pH>9)	TKN (pH<2)	TOC (pH<2)	Total Cyanide (pH>12)	Total Phos (pH<2)	Other	Other

If pH adjustments are required record the information below:

Sample No(s). adjusted: _____

Preservative Name/Conc.: _____ Volume of Preservative used (ml): _____

Lot # of Preservative(s): _____ Expiration Date: _____

The appropriate Project Manager and Department Manager should be notified about the samples which were pH adjusted.

** Samples for Metal analysis which are out of compliance must be acidified at least 24 hours prior to analysis.*

Initials: ACCP **Date:** 04/11/19

EDS-WI-038, Rev 4, 06/09/2014

Login Sample Receipt Checklist

Client: Michigan Dept of Environmental Quality

Job Number: 460-179559-1

Login Number: 179559
List Number: 1
Creator: Rivera, Kenneth

List Source: Eurofins TestAmerica, Edison

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

AECOM

About AECOM

AECOM is built to deliver a better world. We design, build, finance and operate critical infrastructure assets for governments, businesses and organizations. As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges. From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated and vital. A Fortune 500 firm, AECOM had revenue of approximately $20.2 billion during fiscal year 2019.

See how we deliver what others can only imagine at aecom.com and @AECOM.