

Evaluation of Ionia Wastewater Treatment Plant (WWTP) Biosolids Land Application Sites 08N06W02-RW01, RW02 & RW03

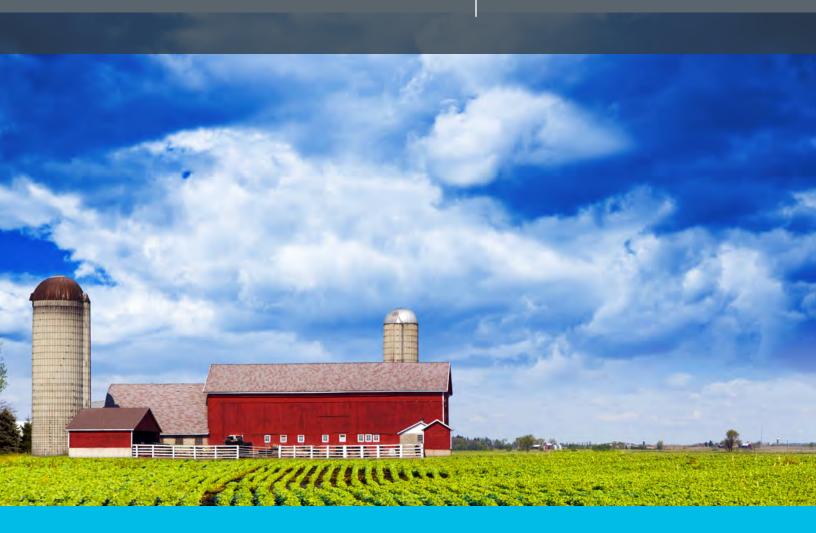
Ionia County, Michigan

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1. Introduction

This technical memorandum summarizes and reports the findings of site investigations conducted at land application Sites 08N06W02-RW01 (Site RW01), 08N06W02-RW02 (Site RW02) and 08N06W02-RW03 (Site RW03) (**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 Ionia Wastewater Treatment Plant (WWTP) in the neighboring residential wells.

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

2. Background

Site RW01 is a 62-acre field southeast of Cedar Lake Road and W S County Line Road in Fenwick, Michigan, approximately 10 miles northeast of the Ionia WWTP. The Prairie Creek flows along the eastern edge of Site RW01 from north to south. Site RW02 is a 72-acre field directly west of Site RW01, on the southwest corner of Cedar Lake Road and W S County Line Road. Sites RW01 and RW02 are approximately a quarter mile north of Palo, Michigan and Site RW03. Site RW03 is a 26-acre field south of Van Vleck Road, directly east of the town of Palo, Michigan. The Prairie Creek also flows along the eastern edge of Site RW03.

Application to apply biosolids from the Ionia WWTP to Site RW01 was first received by the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division (WRD) in 2003. Records indicate Site RW01 received 1773 dry tons (dT) of biosolids from nine (9) applications by the Ionia WWTP from 2003 through 2017. Applications were mostly consistent across a majority of the entire acreage of the Site and were relatively moderate or heavy, ranging from 64.68 to 298.22 dT and application rates of 1.55 to 5.78 dT per acre. The average application rate was 4.0 dT per acre. The application of biosolids to Site RW01 is attached in **Table 1a**.

Application to apply biosolids from the Ionia WWTP to Site RW02 was first received by the EGLE WRD in 2004. Records indicate Site RW02 received 943.4 dT of biosolids from seven (7) applications by the Ionia WWTP from 2004 through 2011. Applications did not cover the entire acreage of the Site and were relatively moderate, ranging from 60.2 to 202.53 dT and application rates of 2.15 to 6.08 dT per acre. The average application rate was 4.15 dT per acre. The application of biosolids to Site RW02 is attached in **Table 1b**.

Application to apply biosolids from the Ionia WWTP to Site RW03 was first received by the EGLE WRD in 2008. Records indicate Site RW03 received 312.790 dT of biosolids from three (3) applications by the Ionia WWTP from 2009 through 2015. Applications mostly covered the entire acreage of the Site and were relatively moderate, ranging from 34.97 to 147.26 dT and application rates of 3.18 to 5.66 dT per acre. The average application rate was 4.62 dT per acre. The application of biosolids to Site RW03 is attached in **Table 1c**.

The investigation conducted by AECOM on behalf of EGLE was performed in accordance with applicable AECOM, EGLE, and US Environmental Protection Agency (USEPA) guidance

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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 (4) primary sources of PFAS: fire training/fire response sites, industrial sites, landfills, and wastewater treatment plants/biosolids.

AECOM initially sampled the Ionia WWTP on October 31, 2018. The Ionia WWTP has an approved Industrial Pretreatment Program (IPP) and authorization to discharge treated municipal wastewater under NPDES permit number MI0021041. The influent, effluent, and biosolids were analyzed for EGLE's recommended minimum analyte list of 24 PFAS compounds, using an isotope dilution method. The influent and effluent samples collected during the AECOM October 2018 event exceeded Rule 57 Water Quality Standards (WQS) for Perfluorooctane Sulfonic Acid (PFOS) (12 ng/L); however, the samples did not exceed Rule 57 WQS for Perfluorooctanoic Acid (PFOA) (12,000 ng/L) (**Section 8**). The Ionia WWTP has frequently sampled its effluent since October 2018 for PFAS. The results from the Ionia WWTP sampling events are summarized below, listed as the range of values detected by year.

Sample Location	Sample Year	PFOA¹ (detection range)	PFOS¹ (detection range)
Influent	2018	< 1.53 – < 2.00	213 – 499.36
Influent	2019	< 15.17	< 15.17
Effluent	2018	< 1.6 – 2.5	185 – 635
Effluent	2019	< 2.00 - 10.25	< 2.00 – 217.43
Effluent	2020	< 3.87 – 6.45	< 3.87 – 25.48
Biosolids	2018	< 9.7 – 1.45	1000 – 1220

 $^{^{1}}$ Units for aqueous samples are in nanograms per liter (ng/L) or parts per trillion (ppt) and the solids are in micrograms per kilogram (μ g/Kg) or parts per billion (ppb).

The Ionia WWTP has been approved to apply biosolids to the neighboring farmland since 2003, which provided Sites RW01, RW02 and RW03 for the study of biosolids from an IPP WWTP in the soil, surface water, and groundwater. The analytical results from sampling the influent, effluent, and biosolids at the Ionia 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 Ionia 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 Ionia 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 Ionia WWTP and agricultural fields RW01, RW02 and RW03, 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.

Sites 03N02W29-DT01 & DT02

EGLE conducted an initial, limited investigation in September 2019 through July 2020 at the lonia WWTP Sites RW01, RW02, and RW03 that included the collection of 37 nearby residential well samples. EGLE sampled nearby residential wells for protection of public health in the absence of being able to directly sample the soil, surface water, and groundwater at Sites RW01, RW02, and RW03 (**Figure 2**).

3. Hydrogeology/Geology

The geology and topography of Sites RW01, RW02, and RW03 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. The area is composed of end moraines and outwash plains that are predominately composed of a sandy outwash and loamy till. **Appendix A** provides the primary surface soil types identified on each field by the USDA Natural Resources Conservation Service Web Soil Survey. No soil borings were installed during this investigation. Only residential well samples were collected adjacent to the Sites.

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 indicates groundwater flows to the east at Sites RW01, RW02 and RW03 (**Figure 2**). The figure also shows that the primary groundwater discharge point is the Prairie Creek, located east of the Ionia Sites, which flows from north to south.

4. Scope of Work

A total of 37 residential well samples were collected adjacent to the agricultural fields and in the nearby town of Palo, Michigan to evaluate the potential PFAS impact from the Ionia WWTP biosolids. The first 31 residential samples collected from August 2019 to March 2020 were submitted to Vista Analytical Laboratories and analyzed for USEPA Method 537 Rev 1.1 which had an analyte list of 14 PFAS. In July 2020 the last six (6) residential samples were collected and analyzed by Vista Analytical Laboratories using USEPA Method 537.1 which had an analyte list of 18 PFAS. The full list of 18 PFAS analytes is provided below with the final four (4) compounds on the list being the additional analytes that were later added for analysis.

PFAS Name	Carbon Chain length (C#)	Acronym	CAS#
Perfluorohexanoic Acid1	C6	PFHxA	307-24-4
Perfluoroheptanoic Acid1	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 Acid1	C13	PFTrDA	72629-94-8
Perfluorotetradecanoic Acid1	C14	PFTeDA	376-06-7
Perfluorobutane Sulfonic Acid ²	C4	PFBS	375-73-5
Perfluorohexane Sulfonic Acid ²	C6	PFHxS	355-46-4

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PFAS Name	Carbon Chain length (C#)	Acronym	CAS#
Perfluorooctane Sulfonic Acid ²	C8	PFOS	1763-23-1
N-Ethyl Perfluorooctane Sulfonamidoacetic Acid ³	C8	EtFOSAA	2991-50-6
N-Methyl Perfluorooctane Sulfonamidoacetic Acid ⁴	C8	MeFOSAA	2355-31-9
Perfluoro (2-methyl-3- oxahexanoic) Acid⁵	C6	HFPO-DA (Gen-X)	13252-13-6
4,8-Dioxa-3H- perfluorononanoic Acid⁵	C10	ADONA	919005-14-4
9-chlorohexadecafluoro-3- oxanone-1-sulfonic Acid ⁵	C8	F-53B Minor	756426-58-1
11-chloroeicosafluoro-3- oxaundecane-1-sulfonic Acid ⁵	C10	F-53B Major	763051-92-9

¹Perfluoroalkyl Carboxylic Acids (PFCAs) Family is composed of the following PFAS: PFHxA, PFHpA, PFOA, PFDA, PFUnDA, PFDDDA, PFTrDA, PFTeDA

5. Residential Well Sampling

A total of 37 residential well samples were collected from households adjacent to Sites RW01, RW02, and RW03 and in the nearby town of Palo, Michigan (**Figure 2**). Prior to collection of the residential well samples, field staff inquired details of the well (e.g., depth of well, age of well, treatment to well if applicable, etc.) and determined the best sample port nearest to the source of groundwater. The groundwater was purged and allowed to flush for approximately five (5) minutes. The analytical data are summarized in the table below and attached in **Table 2** and **Figure 2**.

Residential Sample ID	Sample Date	Well Depth ²	Total PFAS ¹	PFHxA ¹	PFOA ¹	PFNA ¹	PFBS ¹	PFHxS ¹	PFOS ¹
WT1907100910ST	7/10/2019	42	ND	< 2	< 2	< 2	< 2	< 2	< 2
WR1907100930ST	7/10/2019	31	308	75	33	< 2	140	5	2.0
WT1907100950ST	7/10/2019	127	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT1907101005ST	7/10/2019	64	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT1907101015ST	7/10/2019	60	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT1907101035ST	7/10/2019	59	36	5	9	< 2	3	3	13.0
WT1907101045ST	7/10/2019	30	15	< 2	4	< 2	3	4	4.0
WR1909240900KER	9/24/2019	30	ND	< 2	< 2	< 2	< 2	< 2	< 2
WR1909240920KER	9/24/2019	86	ND	< 2	< 2	< 2	< 2	< 2	< 2
WR1909240930KER	9/24/2019	75	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT1909240950KER	9/24/2019	N/A	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT1909241000KER	9/24/2019	100	ND	< 2	< 2	< 2	< 2	< 2	< 2

²Perfluoroalkane Sulfonic Acids (PFSAs) Family is composed of the following PFAS: PFBS, PFHxS, PFOS

³N-Ethyl Perfluoroalkane Sulfonamidoacetic Acids (EtFASAAs) Family is composed of the following PFAS: EtFOSAA

⁴N-Methyl Perfluoroalkane Sulfonamidoacetic Acids (MeFASAAs) Family is composed of the following PFAS: MeFOSAA

⁵Recent PFAS developed as replacement chemistry

Residential Sample ID	Sample Date	Well Depth ²	Total PFAS ¹	PFHxA ¹	PFOA ¹	PFNA ¹	PFBS ¹	PFHxS ¹	PFOS ¹
WT1909241020KER	9/24/2019	140	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT1909241030KER	9/24/2019	N/A	34	4	6	< 2	17	2	3
WR1909241040KER	9/24/2019	50	74	12	31	< 2	11	3	6.0
WT1909241050KER	9/24/2019	40	5	< 2	2	< 2	3	< 2	< 2
WT1909241110KER	9/24/2019	N/A	26	5	10	< 2	4	3	< 2
WT1909241120KER	9/24/2019	117	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT1909241145KER	9/24/2019	39	ND	< 2	< 2	< 2	< 2	< 2	< 2
WSFT2003180950ST	3/18/2020	128	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT2003181015ST	3/18/2020	118	ND	< 2	< 2	< 2	< 2	< 2	< 2
WR2003181030ST	3/18/2020	67	ND	< 2	< 2	< 2	< 2	< 2	< 2
WSFT2003181120ST	3/18/2020	36	3	< 2	< 2	< 2	3	< 2	< 2
WT2003181250ST	3/18/2020	140	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT2003181340ST	3/18/2020	N/A	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT2003181350ST	3/18/2020	N/A	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT2003181400ST	3/18/2020	45	ND	< 2	< 2	< 2	< 2	< 2	< 2
WR2003181420ST	3/18/2020	N/A	125	13	26	3	10	7	58
WT2003181430ST	3/18/2020	N/A	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT2003181515ST	3/18/2020	N/A	23	5	10	< 2	< 2	< 2	4
WR2003181530ST	3/18/2020	52	ND	< 2	< 2	< 2	< 2	< 2	< 2
WR2007161320GGA	7/16/2020	N/A	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT2007161330GGA	7/16/2020	38	3	< 2	< 2	< 2	3	< 2	< 2
WT2007161400GGA	7/16/2020	N/A	9	4	3	< 2	< 2	< 2	2.0
WT2007161415GGA	7/16/2020	62	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT2007161500GGA	7/16/2020	N/A	ND	< 2	< 2	< 2	< 2	< 2	< 2
WT2007161530GGA	7/16/2020	54	ND	< 2	< 2	< 2	< 2	< 2	< 2

¹Units are in nanograms per liter (ng/L) or parts per trillion (ppt). ²Units are in feet below ground surface (ft bgs). N/A indicates unknown well depths. ND = Non-Detect with typical detection limits between 2 to 4 ng/L.

All samples taken from the 37 residential wells did not exceed Part 201 Residential and Nonresidential Drinking Water Criteria (DWC) for PFNA, PFHxS, PFHxA, and PFBS of 6, 51, 400,000, and 420 ng/L, respectively (**Table 2**). The following six (6) residential well samples exceeded Part 201 DWC for PFOA of 8 ng/L: WR1907100930ST, WT1907101035ST, WR1909241040KER, WT1909241110KER, WR2003181420ST and WT2003181515ST. Sample WR2003181420ST also exceeded Part 201 DWC for PFOS of 16 ng/L.

Per the Michigan Department of Health and Human Services (MDHHS) Site-Specific Public Health Action Plan for Private Drinking Water Wells, PFAS results were screened against the EGLE PFAS Health Based Values (i.e. the Part 201 DWC) since those values are lower than the MDHHS PFAS Public Health Drinking Water Screening Levels (SL), except for PFOS. The Part 201 DWC for PFOS is 16 ng/L, while the MDHHS (SL) is 8 ng/L. Samples WR2003181420ST (58 ng/L PFOS) and WT1907101035ST (13 ng/L PFOS) exceeded the MDHHS SL for PFOS.

Five (5) of the six (6) residential well samples that exceeded the Part 201 DWC for PFOA are located adjacent to the western edge of Site RW03, while the sixth residential well sample is located along the northern edge of Site RW01 (**Figure 3**). The depth of all six (6) residential

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wells are relatively shallow, ranging from 31 to 59 feet below ground surface (bgs) or the depth is unknown. The single residential well sample that also exceeded the Part 201 DWC for PFOS is also located adjacent to the western edge of Site RW03 (**Figure 4**). The Ionia County Health Department in coordination with the MDHHS offered point-of-use (POU) filters as an interim response action to all households with detections of PFAS in their residential well, except for two (2) homes which only had detections of PFBS of 3 ng/L, which is significantly lower than the Part 201 DWC of 420 ng/L.

6. QA/QC Results

Laboratory reports 1902059, 1903280, 2000597, 2000598, 2000599, 2000600, 2000601, 2000602, 2000603, 2000604, 2000605, 2000606, 2000607, 2000608, 2001528 (Residential Wells) and 1803583 (Ionia WWTP) from Vista Analytical Laboratories were subjected to data quality review (**Appendix B**). 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.

7. Investigation-Derived Waste (IDW)

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

- Disposable material such as:
 - Personal protective equipment (PPE)
 - Paper towels
 - Rags
 - Sampling waste (label backings, empty field blank bottles)
 - Buckets

Minimally contaminated disposable sampling materials and PPE were containerized and disposed of as ordinary solid waste.

8. Pathway and Receptors Evaluation

An exposure pathway includes five (5) 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.

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Potentially complete groundwater exposure pathways associated with Sites RW01, RW02 and RW03 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

¹Units 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

8.1 Residential Wells - Groundwater Evaluation

The EGLE Wellogic database was used to identify residential wells located near Sites RW01, RW02, RW03, and in the nearby town of Palo, Michigan. The EGLE Wellogic database does not include all of the well records; however, a review of additional scanned well logs was also performed. EGLE and AECOM contacted numerous households for residential well sampling based on their proximity to Sites RW01, RW02, and RW03, 37 of which provided access to sample their wells. Based on the results of this initial investigation, there is an unacceptable risk based on Part 201 DWC. Groundwater may also be used for agricultural irrigation, however; no irrigation wells are located on Sites RW01, RW02 or RW03.

9. Summary and Discussion

AECOM conducted a field investigation to determine the impact, if any, from the land application of biosolids containing high levels of PFAS concentrations from the Ionia WWTP in the residential wells near Sites RW01, RW02 and RW03. Land application field investigations will help guide the understanding of fate and transport of PFAS in environmental matrices and supplement fate and transport modeling analysis being conducted on this topic.

The residential well sampling results indicate varying PFAS concentrations and are summarized in **Table 2**. PFAS were detected in 12 of the 37 residential well samples, with total PFAS concentrations ranging from 3 to 308 ng/L (**Table 2** and **Figure 2**). The laboratory reports are included in **Appendix B**.

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 groundwater. The detection limits for the solid phase (i.e., biosolids and soil) are in micrograms per kilogram (μ g/Kg) or parts per billion (ppb). For the aqueous phase (i.e. groundwater), the detection limits are in 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.

9.1 Residential Wells - Groundwater

A total of 37 residential well samples were collected from neighboring household wells adjacent to Sites RW01, RW02, RW03 and in the nearby town of Palo, Michigan (**Figure 2**). Of the 37 residential samples, 25 reported total PFAS concentrations under detectable limits, while 12 of

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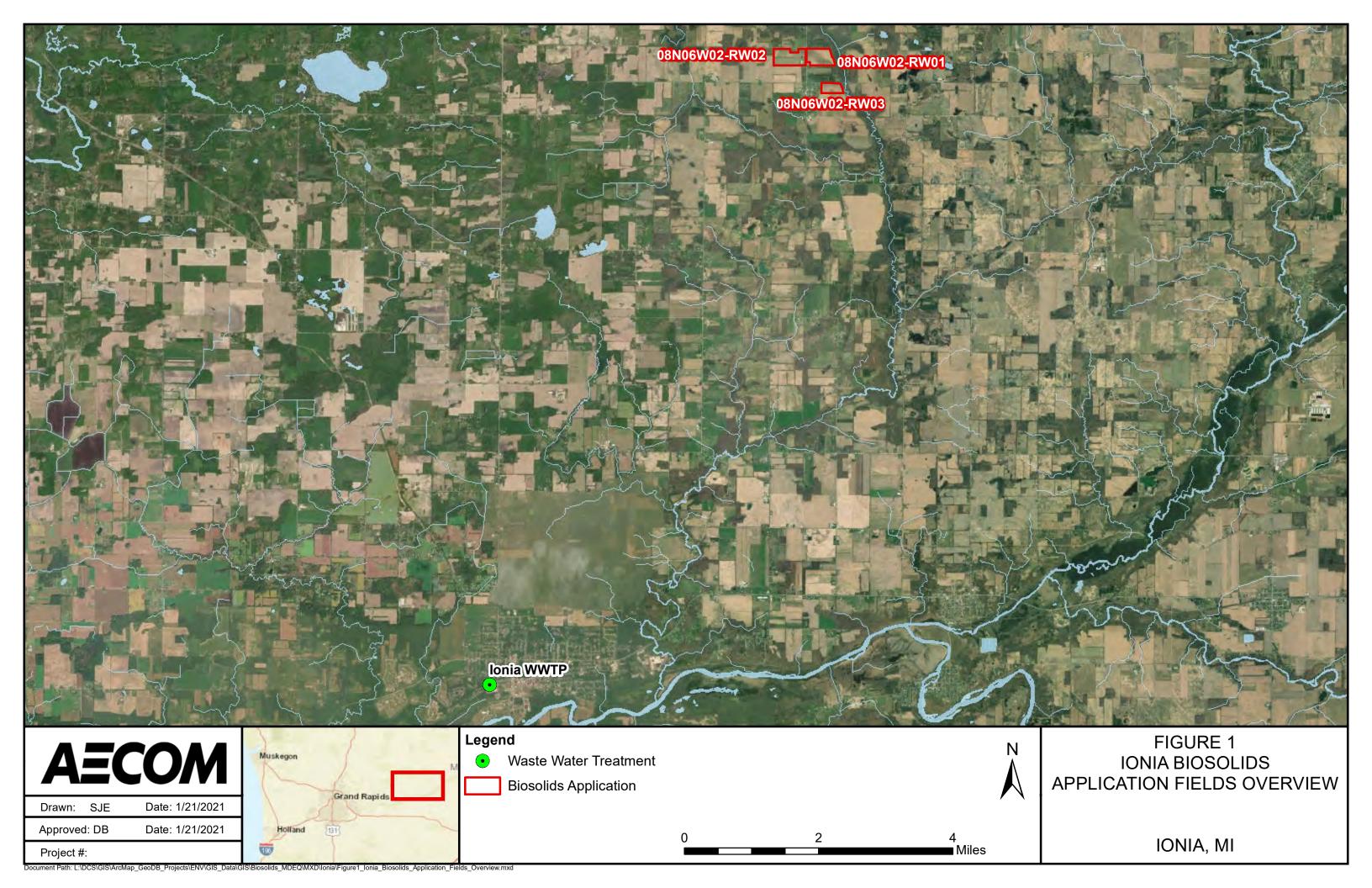
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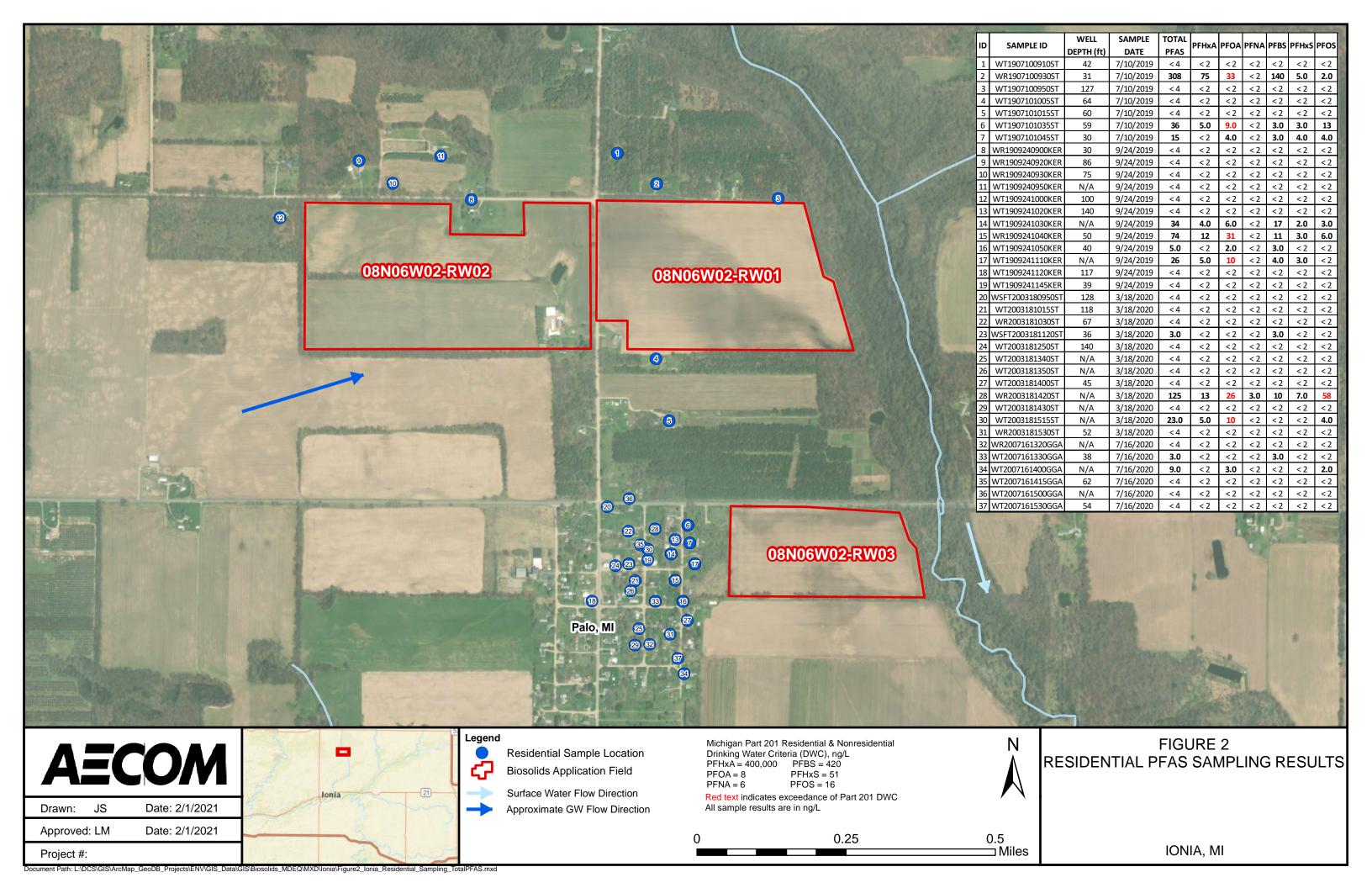
the 37 residential samples reported total PFAS values ranging from 3 to 308 ng/L. Of the 18 PFAS analyzed, the following seven (7) compounds were detected: PFHxA, PFHpA, PFOA, PFNA, PFBS, PFHxS, and PFOS. The following six (6) residential well samples exceeded Part 201 DWC for PFOA of 8 ng/L: WR1907100930ST, WT1907101035ST, WR1909241040KER, WT1909241110KER, WR2003181420ST and WT2003181515ST. Only sample WR2003181420ST exceeded Part 201 DWC for PFOS of 16 ng/L. Note, samples WR2003181420ST (58 ng/L PFOS) and WT1907101035ST (13 ng/L PFOS) also exceeded the MDHHS SL for PFOS of 8 ng/L.

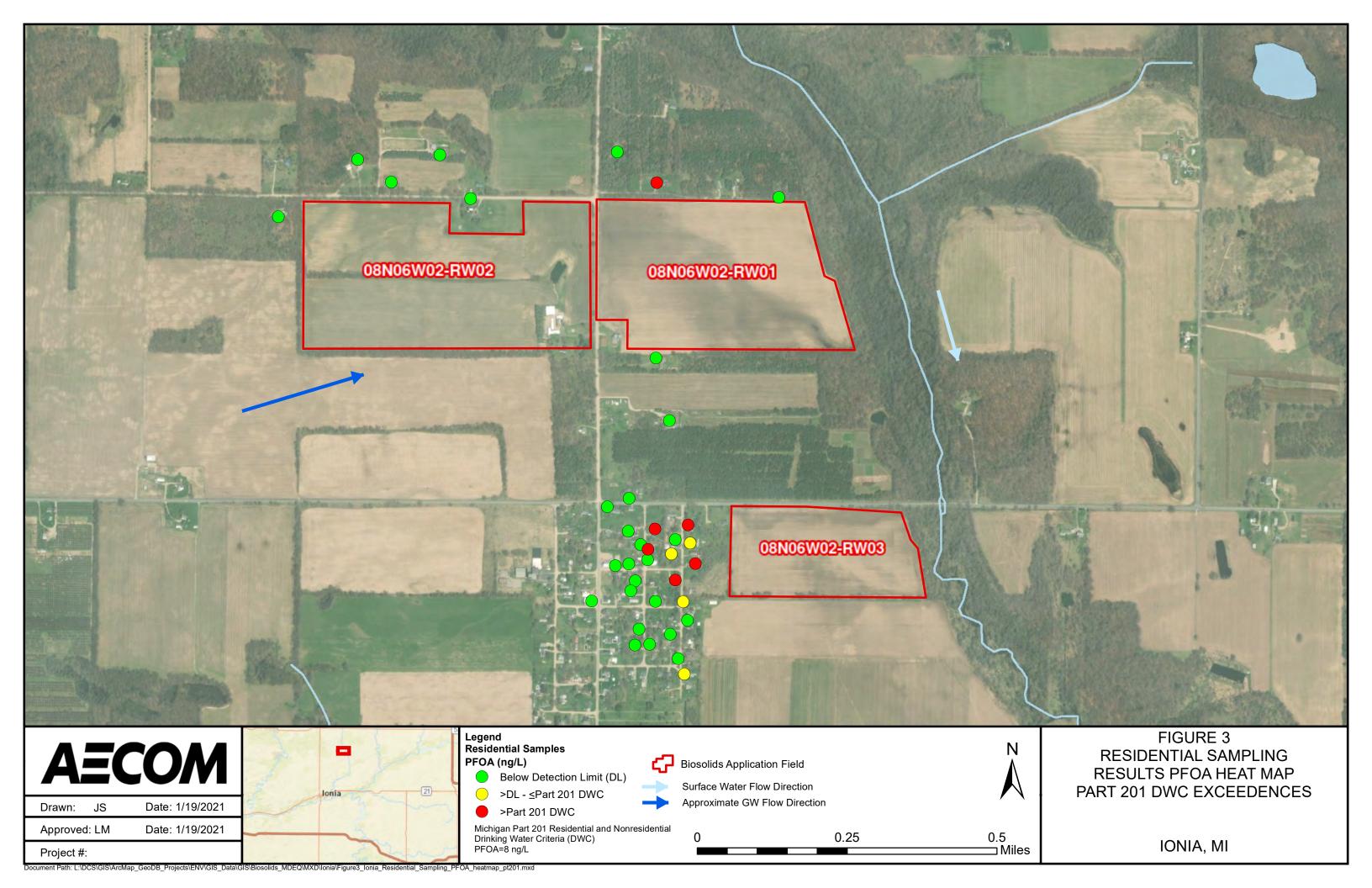
Of the 12 residential well samples that reported PFAS detections, six (6) of the wells are set at relatively shallow depths, between 30 to 59 ft bgs. EGLE and AECOM were unable to determine the well depth for the remaining five (5) residential well sample locations that reported PFAS detections. Additionally, five (5) of the six (6) residential wells that exceeded the Part 201 DWC for PFOS and PFOA are all located closely together in the town of Palo, west of Site RW03. Well logs from the surrounding residential wells, including those in Palo, show they are predominantly placed in the upper drift sediments. The wells to the west of Site RW03 showed an upper clay layer ranging from 11 to 46 ft thick, with deeper layers of sands, clays, and gravels.

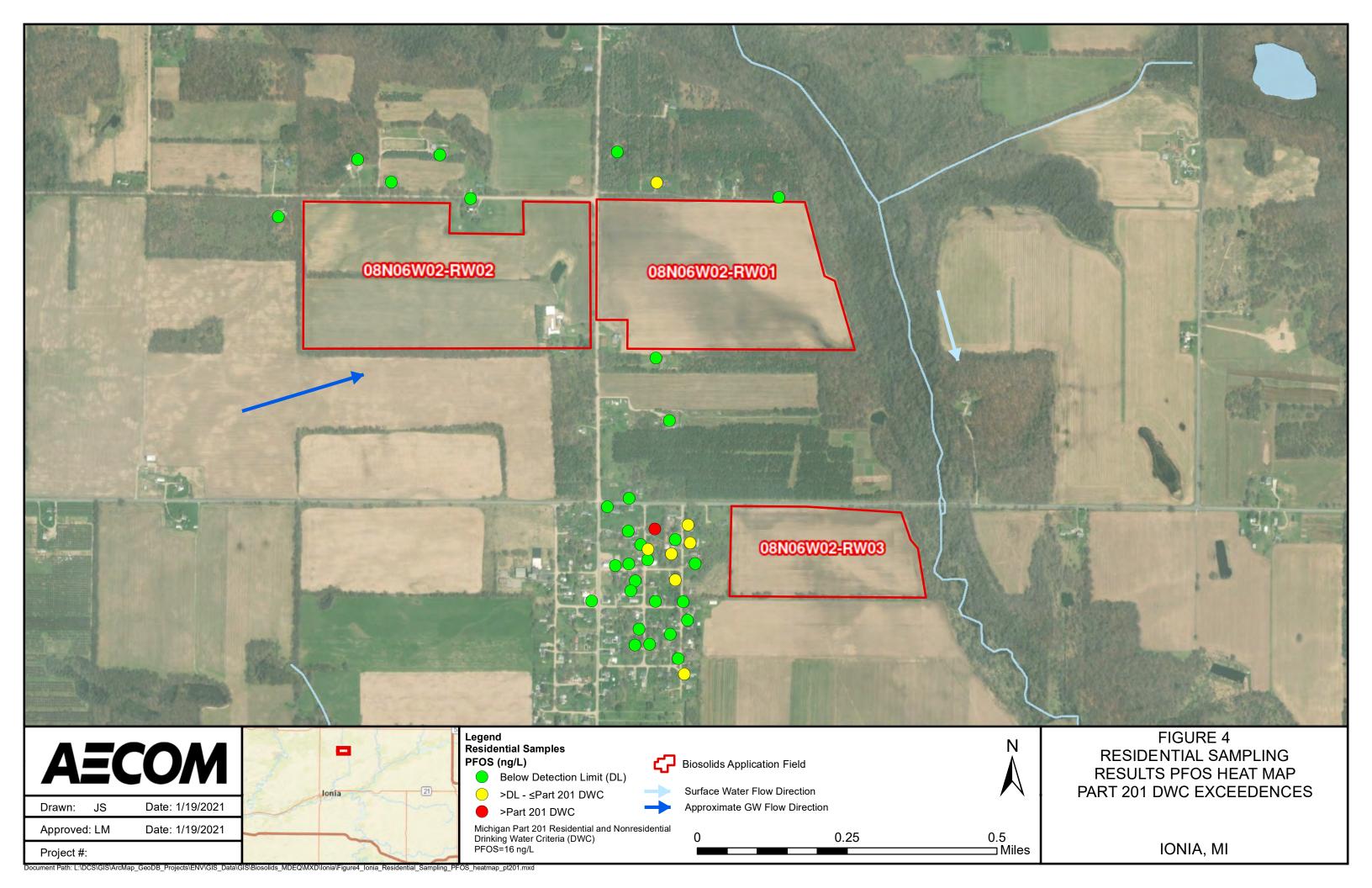
The groundwater from residential wells neighboring Sites RW01, RW02 and RW03 showed impact of short and long-chain PFAS, with PFOA and PFOS Part 201 DWC exceedances and detections of PFHxA, PFHpA, and PFBS. Based on these findings, there does appear to be a potential risk to the surrounding drinking water wells. Since EGLE and AECOM did not directly sample the soil, surface water, and groundwater at Sites RW01, RW02, and RW03, it is unclear if the land application of biosolids from the Ionia WWTP is the source of PFAS contamination in this area. Further investigations are needed to identify the source and determine the extent of PFAS in this area.

Figures









Tables

Table 1a

Parcel ID: 08N06W02-RW01 Biosolids Application Data

Year	Site ID	Dry Ton (dT) Land Applied	Acres Used	Acres Approved	Dry Tons (dT) / Acre	Dates/Additional Information
2017	08N06W02-RW01	209.38	62	62	3.38	N/A
2015	08N06W02-RW01	170.46	55	62	3.1	N/A
2012	08N06W02-RW01	274.33	62	62	4.42	N/A
2010	08N06W02-RW01	225.24	39	62	5.78	N/A
2008	08N06W02-RW01	253.73	58	62	4.37	N/A
2007	08N06W02-RW01	93	60	62	1.55	N/A
2006	08N06W02-RW01	64.68	12	62	5.39	N/A
2005	08N06W02-RW01	184.14	62	62	2.97	N/A
2003	08N06W02-RW01	298.22	62	62	4.81	N/A
T	Total dry tons: 1773 Average applic (dry tons/a			4.0		

dT = dry tons

N/A = Not Applicable / Not Provided

Table 1b

Parcel ID: 08N06W02-RW02 Biosolids Application Data

Year	Site ID	Dry Ton (dT) Land Applied	Acres Used	Acres Approved	Dry Tons (dT) / Acre	Dates
2011	08N06W02-RW02	194.33	38	72	5.11	N/A
2009	08N06W02-RW02	152.06	25	72	6.08	N/A
2008	08N06W02-RW02	79.37	20	72	3.97	N/A
2007	08N06W02-RW02	60.2	28	72	2.15	N/A
2006	08N06W02-RW02	202.53	43	72	4.71	N/A
2005	08N06W02-RW02	65.4	20	72	3.27	N/A
2004	08N06W02-RW02	189.5	50	72	3.79	N/A
Т	Total dry tons:			olication rate s/acre):	4.15	

dT = dry tons

N/A = Not Applicable / Not Provided

Table 1c

Parcel ID: 08N06W02-RW03 Biosolids Application Data

Year	Site ID	Dry Ton (dT) Land Applied	ACTES LISER	Acres Approved	Dry Tons (dT) / Acre	Dates
2015	08N06W02-RW03	34.97	11	26	3.18	N/A
2011	08N06W02-RW03	130.56	26	26	5.02	N/A
2009	08N06W02-RW03	147.26	26	26	5.66	N/A
T	Intal nry tone: I 317 /4 I		Average app (dry ton	lication rate s/acre):	4.62	

dT = dry tons

N/A = Not Applicable / Not Provided

Table 2

Parcel ID: 08N06W02-RW01, RW02 RW03 Residential Wells PFAS Analytical Results Summary

Residential Sample ID	Sample Date	Well Depth (ft)	Total PFAS	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFBS	PFHxS	PFOS	EtFOSAA	MeFOSAA	HFPO-DA (Gen-X)	ADONA	F-53B Minor	F-53B Major
WT1907100910ST	7/10/2019	42	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WR1907100930ST	7/10/2019	31	308	75	53	33	< 2	< 2	< 4	< 4	< 4	< 4	140	5	2.0	< 4	< 4				
WT1907100950ST	7/10/2019	127	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WT1907101005ST	7/10/2019	64	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WT1907101015ST	7/10/2019	60	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WT1907101035ST	7/10/2019	59	36	5	3	9	< 2	< 2	< 4	< 4	< 4	< 4	3	3	13.0	< 4	< 4				
WT1907101045ST	7/10/2019	30	15	< 2	< 2	4	< 2	< 2	< 4	< 4	< 4	< 4	3	4	4.0	< 4	< 4				
WR1909240900KER	9/24/2019	30	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WR1909240920KER	9/24/2019	86	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WR1909240930KER	9/24/2019	75	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WT1909240950KER	9/24/2019	N/A	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WT1909241000KER	9/24/2019	100	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WT1909241020KER	9/24/2019	140	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WT1909241030KER	9/24/2019	N/A	34	4	2	6	< 2	< 2	< 4	< 4	< 4	< 4	17	2	3	< 4	< 4				
WR1909241040KER	9/24/2019	50	74	12	11	31	< 2	< 2	< 4	< 4	< 4	< 4	11	3	6.0	< 4	< 4				
WT1909241050KER	9/24/2019	40	5	< 2	< 2	2	< 2	< 2	< 4	< 4	< 4	< 4	3	< 2	< 2	< 4	< 4				
WT1909241110KER	9/24/2019	N/A	26	5	4	10	< 2	< 2	< 4	< 4	< 4	< 4	4	3	< 2	< 4	< 4				
WT1909241120KER	9/24/2019	117	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WT1909241145KER	9/24/2019	39	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WSFT2003180950ST	3/18/2020	128	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4		-		
WT2003181015ST	3/18/2020	118	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4		-		
WR2003181030ST	3/18/2020	67	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4		-		
WSFT2003181120ST	3/18/2020	36	3	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	3	< 2	< 2	< 4	< 4				
WT2003181250ST	3/18/2020	140	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WT2003181340ST	3/18/2020	N/A	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WT2003181350ST	3/18/2020	N/A	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WT2003181400ST	3/18/2020	45	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WR2003181420ST	3/18/2020	N/A	125	13	8	26	3	< 2	< 4	< 4	< 4	< 4	10	7	58	< 4	< 4				
WT2003181430ST	3/18/2020	N/A	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WT2003181515ST	3/18/2020	N/A	23	5	4	10	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	4	< 4	< 4				
WR2003181530ST	3/18/2020	52	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4				
WR2007161320GGA	7/16/2020	N/A	ND	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 4	< 4
WT2007161330GGA	7/16/2020	38	3	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4	3	< 2	< 2	< 4	< 4	< 4	< 4	< 4	< 4
WT2007161400GGA	7/16/2020	N/A	9	4	< 2	3	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	2.0	< 4	< 4	< 4	< 4	< 4	< 4
WT2007161415GGA	7/16/2020	62	ND	< 2	< 3	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 4	< 4
WT2007161500GGA	7/16/2020	N/A	ND	< 2	< 4	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 4	< 4
WT2007161530GGA	7/16/2020	54	ND	< 2	< 5	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 2	< 2	< 2	< 4	< 4	< 4	< 4	< 4	< 4

All values are in nanograms per liter (ng/L) or parts per trillion (ppt)

"<" = Values Below Detection Limit (DL)

ND = Non-Detect (All Values Below DL)

N/A = Not Applicable / Not Provided

"--" = Not Analyzed

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

Perfluoroalkyl Carboxylic Acids (PFCAs)
Perfluoroalkane Sulfonic Acids (PFSAs)
N-Ethyl Perfluoroalkane Sulfonamidoacetic Acids (EtFASAAs)
N-Methyl Perfluoroalkane Sulfonamidoacetic Acids (MeFASAAs)
Per- and Polyfluoroalkyl Ether Carboxylic Acids
Additional Substances

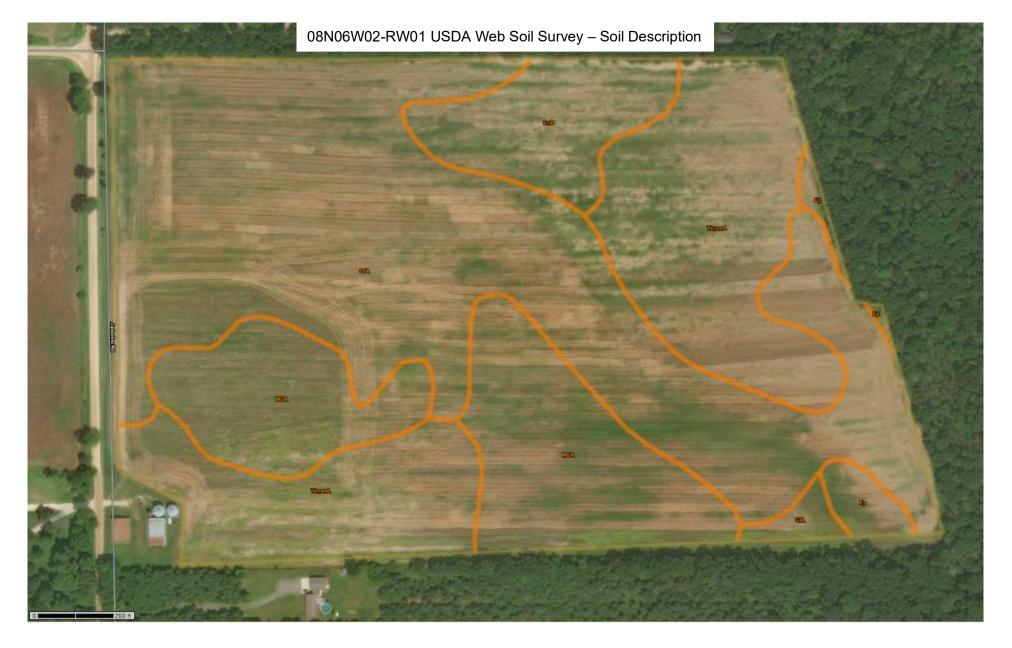
PFHxA = Perfluorohexanoic acid
PFHpA = Perfluoroheptanoic acid
PFOA = Perfluorooctanoic acid
PFNA = Perfluorononanoic acid
PFDA = Perfluorodecanoic acid
PFUnDA = Perfluoroundecanoic acid

PFDoDA = Perfluorododecanoic acid
PFTrDA = Perfluorotridecanoic acid
PFTeDA = Perfluorotetradecanoic acid
PFBS = Perfluorobutane sulfonic acid
PFHxS = Perfluorohexane sulfonic acid
PFOS = Perfluorocotane sulfonic acid

EtFOSAA = N-Ethyl perfluorooctane sulfonamidoacetic acid
MeFOSAA = N-Methyl perfluorooctane sulfonamidoacetic acid
HFPO-DA (Gen-X) = Perfluoro-2-methyl-3-oxahexanoicacid
ADONA = 4,8-Dioxa-3H-perfluorononanoicacid
F-53B Minor = 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid
F-53B Major = 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid

Concentration exceeds DWC criteria

Appendix A



CnB - Coloma loamy sand, Landform: outwash plains, moraines, Parent material: sandy outwash

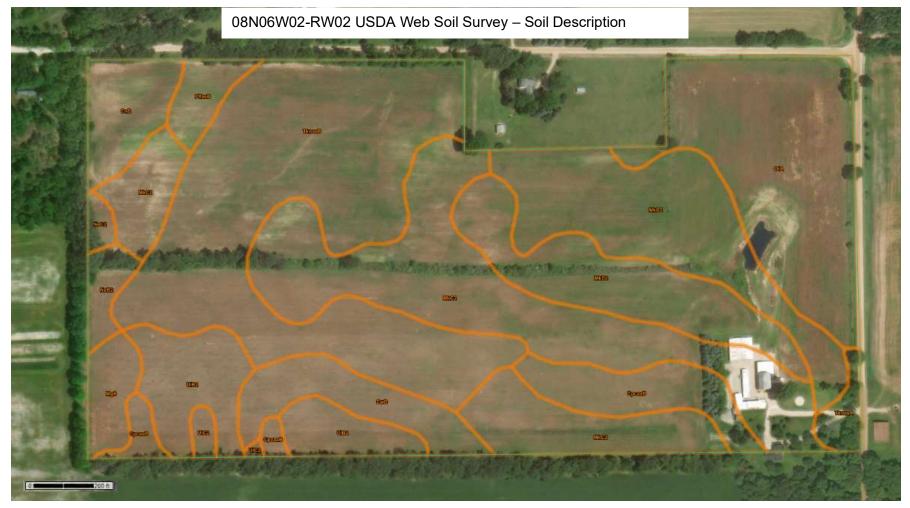
Ep – Epoufette sandy loam, Landform: depressions, outwash plains, Parent material: sandy outwash

GIA – Gladwin sandy loam, Landform: outwash plains, Parent material: sandy glaciofluvial deposits

MdA – Mancelona-Chelsea loamy sands, Landform: outwash plains, and flats, till plains, Parent material: sandy and gravelly outwash, and sandy eolian sands

OtA - Otisco sandy loam, Landform: till plains, Parent material: sandy till

TknaaA – Tekenink-Elmdale loamy sands (0-2% slopes), Landform: recessional moraines and moraines, Parent material: coarse-loamy till



CnB - Coloma loamy sand, Landform: outwash plains, moraines, Parent material: sandy outwash

CpcaaB - Capac loam, Landform: end moraines, ground moraines, Parent material: loamy till

CwB – Coral sandy loam, Landform: moraines, Parent material: loamy till

MgB - Marlette loam, Landform: moraines, till plains, Parent material: loamy till

MkB2 - Marlette sandy loam (2-6% slopes), Landform: end moraines, Parent material: loamy till

MkC2 - Marlette sandy loam (6-12% slopes), Landform: end moraines, Parent material: loamy till

MkD2 - Marlette sandy loam (12-18% slopes), Landform: end moraines, Parent material: loamy till

NeB2 - Nester loam (2-6% slopes), Landform: till plains, Parent material: loamy till

NeC2 - Nester loam (6-12% slopes), Landform: till plains, Parent material: loamy till

OtA - Otisco sandy loam, Landform: till plains, Parent material: sandy till

PlfaeB - Plainfield-Spinks sands, Landform: moraines, outwash plains, Parent material: sandy drift

TknaaB – Tekenink-Elmdale loamy sands (0-6% slopes), Landform: recessional moraines and moraines, Parent material: coarse-loamy till

UIB2 - Ubly sandy loam (2-6% slopes), Landform: till plains, Parent material: loamy till

08N06W02-RW03 USDA Web Soil Survey - Soil Description



- CnB Coloma loamy sand, Landform: outwash plains, moraines, Parent material: sandy outwash
- GhA Gladwin loamy sand, Landform: outwash plains, Parent material: sandy glaciofluvial deposits
- GIA Gladwin sandy loam, Landform: outwash plains, Parent material: sandy glaciofluvial deposits
- OtA Otisco sandy loam, Landform: till plains, Parent material: sandy till
- Sd Sebawa loam, Landform: drainageways on outwash plains and drainageways on moraines, Parent material: loamy drift over sandy and gravelly outwash
- TknaaA Tekenink-Elmdale loamy sands (2-6% slopes), Landform: recessional moraines and moraines, Parent material: coarse-loamy till
- WeA Wasepi sandy loam, Landform: outwash plains, Parent material: loamy over sandy and gravelly glaciofluvial deposits

Appendix B



January 14, 2019

Vista Work Order No. 1803583

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

Dear Ms. Murshak,

Enclosed are the amended 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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Vista Work Order No. 1803583 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. This report was amended to include additional analyses for sample "BS1810310830GC". In addition, the results for 6:2 FTS in samples "WW1810310815GC" and "BS1810310830GC" were reprocessed to reference 13C2-PFOA, due to the interference affecting 13C2-6:2 FTS.

Analytical Notes:

As requested, the sample mass in the second container of sample "BS1810310830GC" was centrifuged. The aqueous and solid phases were extracted and analyzed separately. The results for the aqueous phase have been reported as "BS1810310830GC-A" and the results for the solid phase have been reported as "BS1810310830GC-S".

PFAS Isotope Dilution Method

The wastewater samples, as well as "BS1810310830GC-A", 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.

The wastewater samples contained particulate and were centrifuged prior to extraction.

Holding Times

The samples were originally extracted and analyzed within the method hold times. The wastewater samples required re-extractions, which were performed outside of the hold time.

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 each preparation batch. No analytes were detected in the Method Blanks above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria.

The results for 6:2 FTS in sample "WW1810310800GC" and "BS1810310830GC-A" were reported using 13C2-PFOA as the internal standard.

The labeled standard recoveries outside the acceptance criteria are listed in the table below.

VAL-PFAS

The biosolid sample, as well as "BS1810310830GC-S", 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 each preparation batch. No analytes were detected in the Method Blanks above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria.

The results for 6:2 FTS in sample "BS1810310830GC" were reported using 13C2-PFOA as the internal standard.

The labeled standard recoveries outside the acceptance criteria are listed in the table below.

QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
1803583-02	WW1810310800GC	PFAS Isotope Dilution Method	13C2-PFUnA	Н	51.6
1803583-03	BS1810310830GC	VAL - PFAS	13C3-PFBA	Н	4.50
1803583-03	BS1810310830GC	VAL - PFAS	13C3-PFPeA	Н	24.8
1803583-03	BS1810310830GC	VAL - PFAS	13C2-PFHxA	Н	69.5
1803583-03	BS1810310830GC	VAL - PFAS	13C2-8:2 FTS	Н	221
1803583-03	BS1810310830GC	VAL - PFAS	d3-MeFOSAA	Н	46.8
1803583-03	BS1810310830GC	VAL - PFAS	13C2-PFDoA	Н	25.4
1803583-03	BS1810310830GC	VAL - PFAS	13C2-PFTeDA	Н	8.70
1803583-04	BS1810310830GC-S	VAL - PFAS	13C2-8:2 FTS	Н	169
1803583-04	BS1810310830GC-S	VAL - PFAS	13C2-PFDoA	Н	23.7
1803583-05	BS1810310830GC-A	PFAS Isotope Dilution Method	13C2-PFUnA	Н	59.9
B8K0155-BLK1	B8K0155-BLK1	VAL - PFAS	13C2-PFHxA	Н	69.6
B8K0155-BLK1	B8K0155-BLK1	VAL - PFAS	13C2-PFDA	Н	55.5
B8K0155-BLK1	B8K0155-BLK1	VAL - PFAS	d3-MeFOSAA	Н	44.7
B8K0155-BLK1	B8K0155-BLK1	VAL - PFAS	d5-EtFOSAA	Н	49.8
B8K0155-BLK1	B8K0155-BLK1	VAL - PFAS	13C2-PFUnA	Н	56.6
B8K0155-BS1	B8K0155-BS1	VAL - PFAS	13C2-PFDA	Н	55.3
B8K0155-BS1	B8K0155-BS1	VAL - PFAS	d3-MeFOSAA	Н	45.1
B8K0155-BS1	B8K0155-BS1	VAL - PFAS	13C2-PFUnA	Н	56.1
B8K0194-BS1	B8K0194-BS1	PFAS Isotope Dilution Method	13C2-PFDA	Н	57.8
B8K0194-BS1	B8K0194-BS1	PFAS Isotope Dilution Method	13C2-PFUnA	Н	59.1

H = Recovery was outside laboratory acceptance criteria.

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1803583-01	WW1810310815GC	31-Oct-18 08:15	09-Nov-18 09:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1803583-02	WW1810310800GC	31-Oct-18 08:00	09-Nov-18 09:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1803583-03	BS1810310830GC	31-Oct-18 08:30	09-Nov-18 09:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1803583-04	BS1810310830GC-S	31-Oct-18 08:30	09-Nov-18 09:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1803583-05	BS1810310830GC-A	31-Oct-18 08:30	09-Nov-18 09:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 1803583 Client Project: Statewide WWTP Biosolids PFAS Evaluation

ANALYTICAL RESULTS



Sample ID: Method Blank PFAS Isotope Dilution Method

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Aqueous Lab Sample: B8K0194-BLK1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation

Conc. (ng/L) DLLOD LOQ **Qualifiers** Batch Extracted Samp Size **CAS Number** Analyzed Dilution Analyte **PFBA** 375-22-4 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 30-Nov-18 00:22 0.250 L **PFPeA** 2706-90-3 ND 2.00 0.250 L 1.37 4.00 B8K0194 28-Nov-18 30-Nov-18 00:22 **PFBS** 375-73-5 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 4:2 FTS 757124-72-4 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 **PFHxA** 307-24-4 ND 1.37 2.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 4.00 **PFPeS** 2706-91-4 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 **PFHpA** 375-85-9 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 **PFHxS** 355-46-4 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 0.250 L 6:2 FTS 27619-97-2 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 30-Nov-18 00:22 **PFOA** 335-67-1 ND 2.00 B8K0194 28-Nov-18 0.250 L 1.37 4.00 30-Nov-18 00:22 **PFHpS** 375-92-8 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 375-95-1 2.00 B8K0194 28-Nov-18 0.250 L **PFNA** ND 1.37 4.00 30-Nov-18 00:22 **PFOSA** 754-91-6 ND 1.37 2.00 B8K0194 28-Nov-18 0.250 L 4.00 30-Nov-18 00:22 **PFOS** 1763-23-1 2.00 B8K0194 28-Nov-18 0.250 L ND 1.37 4.00 30-Nov-18 00:22 PFDA 335-76-2 ND 1.37 2.00 0.250 L 4.00 B8K0194 28-Nov-18 30-Nov-18 00:22 8:2 FTS 39108-34-4 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 ND **PFNS** 68259-12-1 1.94 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 MeFOSAA 2355-31-9 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 **EtFOSAA** 2991-50-6 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 **PFUnA** 2058-94-8 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 **PFDS** 335-77-3 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 PFDoA 307-55-1 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 **PFTrDA** 72629-94-8 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 **PFTeDA** 376-06-7 ND 1.37 2.00 4.00 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 **Labeled Standards Type** % Recovery Limits **Oualifiers** Batch **Extracted** Samp Size Analyzed Dilution IS 60 - 130 13C3-PFBA 100 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 IS 13C3-PFPeA 101 60 - 150 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 IS 13C3-PFBS 103 60 - 150 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 13C2-4:2 FTS IS 104 40 - 150 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 13C2-PFHxA IS 99.9 70 - 130B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 13C4-PFHpA IS 96.9 60 - 150 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 18O2-PFHxS IS 100 60 - 130 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 13C2-6:2 FTS IS 90.5 40 - 150 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 1 13C2-PFOA IS 78.9 60 - 130 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 13C5-PFNA IS 68.2 50 - 130 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 1 13C8-PFOSA IS 32.0 20 - 150 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 13C8-PFOS IS 78.8 60 - 130B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22 1 13C2-PFDA IS 67.5 60 - 130B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:22

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

Client Data Laboratory Data

Merit Laboratories, Inc. Lab Sample: Name: Matrix: Aqueous B8K0194-BLK1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	70.0	40 - 150		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:22	1
d3-MeFOSAA	IS	63.6	50 - 150		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:22	1
d5-EtFOSAA	IS	71.9	50 - 150		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:22	. 1
13C2-PFUnA	IS	65.2	60 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:22	1
13C2-PFDoA	IS	72.0	30 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:22	. 1
13C2-PFTeDA	IS	62.5	20 - 150		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:22	1

Results reported to the DL. When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both LOD - Limit of Detection DL - Detection Limit LOQ - Limit of quantitation

linear and branched isomers. Only the linear isomer is reported for all other

Work Order 1803583 Revision 2 Page 8 of 39



Sample ID: OPR

PFAS Isotope Dilution Method

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Aqueous Lab Sample: B8K0194-BS1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	42.6	40.0	107	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFPeA	2706-90-3	43.5	40.0	109	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFBS	375-73-5	44.1	40.0	110	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
4:2 FTS	757124-72-4	42.2	40.0	105	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFHxA	307-24-4	43.4	40.0	109	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFPeS	2706-91-4	42.2	40.0	105	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFHpA	375-85-9	42.4	40.0	106	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFHxS	355-46-4	42.0	40.0	105	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
6:2 FTS	27619-97-2	44.9	40.0	112	60 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFOA	335-67-1	45.8	40.0	114	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFHpS	375-92-8	44.3	40.0	111	60 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFNA	375-95-1	40.7	40.0	102	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFOSA	754-91-6	40.2	40.0	101	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFOS	1763-23-1	39.7	40.0	99.2	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFDA	335-76-2	41.6	40.0	104	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
8:2 FTS	39108-34-4	45.6	40.0	114	60 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFNS	68259-12-1	39.3	40.0	98.1	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
MeFOSAA	2355-31-9	40.8	40.0	102	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
EtFOSAA	2991-50-6	38.7	40.0	96.8	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFUnA	2058-94-8	44.9	40.0	112	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFDS	335-77-3	37.0	40.0	92.5	60 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFDoA	307-55-1	49.3	40.0	123	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFTrDA	72629-94-8	47.5	40.0	119	60 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
PFTeDA	376-06-7	45.3	40.0	113	70 - 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
Labeled Standards		Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA		IS		87.1	60- 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
13C3-PFPeA		IS		90.8	60- 150		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
13C3-PFBS		IS		81.6	60- 150		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
13C2-4:2 FTS		IS		85.1	40- 150		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
13C2-PFHxA		IS		86.5	70- 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
13C4-PFHpA		IS		82.2	60- 150			28-Nov-18	0.250 L	30-Nov-18 00:11	
18O2-PFHxS		IS		85.5	60- 130			28-Nov-18	0.250 L	30-Nov-18 00:11	1
13C2-6:2 FTS		IS		74.2	40- 150			28-Nov-18	0.250 L	30-Nov-18 00:11	
13C2-PFOA		IS		70.6	60- 130			28-Nov-18	0.250 L	30-Nov-18 00:11	
13C5-PFNA		IS		61.5	50- 130		B8K0194	28-Nov-18	0.250 L	30-Nov-18 00:11	1
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Sample ID: OPR

PFAS Isotope Dilution Method

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Aqueous Lab Sample: B8K0194-BS1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation

Labeled Standards Type % Rec Limits Qualifiers Analyzed **Dilution** Extracted Batch Samp Size 13C8-PFOSA IS 30.7 20-150 B8K0194 28-Nov-18 30-Nov-18 00:11 0.250 L 60-130 B8K0194 28-Nov-18 13C8-PFOS IS 67.3 0.250 L30-Nov-18 00:11 1 IS 57.8 60-130 B8K0194 28-Nov-18 13C2-PFDA 0.250 L 30-Nov-18 00:11 Η 40- 150 B8K0194 28-Nov-18 13C2-8:2 FTS IS 0.250 L30-Nov-18 00:11 63.0 1 IS 50- 150 B8K0194 28-Nov-18 d3-MeFOSAA 51.5 0.250 L 30-Nov-18 00:11 d5-EtFOSAA IS 53.7 50-150 B8K0194 28-Nov-18 0.250~L30-Nov-18 00:11 1 13C2-PFUnA B8K0194 28-Nov-18 IS 59.1 60-130 Η 0.250 L 30-Nov-18 00:11 13C2-PFDoA IS 60.8 30-130 B8K0194 28-Nov-18 0.250~L30-Nov-18 00:11 1 13C2-PFTeDA IS 53.9 20-150 B8K0194 28-Nov-18 0.250 L 30-Nov-18 00:11

Work Order 1803583 Revision 2 Page 10 of 39



Sample ID: Method Blank PFAS Isotope Dilution Method

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Aqueous Lab Sample: B8L0090-BLK1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation Conc. (ng/L) DLLOD LOQ **Qualifiers** Batch Extracted Samp Size **CAS Number** Analyzed Dilution Analyte **PFBA** 375-22-4 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 23-Dec-18 23:06 0.250 L **PFPeA** ND 2.00 2706-90-3 1.37 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 **PFBS** 375-73-5 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 4:2 FTS 757124-72-4 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 **PFHxA** 307-24-4 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 **PFPeS** 2706-91-4 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 **PFHpA** 375-85-9 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 14-Dec-18 **PFHxS** 355-46-4 ND 1.37 2.00 4.00 B8L0090 0.250 L 23-Dec-18 23:06 1 0.250 L 6:2 FTS 27619-97-2 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 23-Dec-18 23:06 **PFOA** 335-67-1 ND 2.00 B8L0090 14-Dec-18 0.250 L 1.37 4.00 23-Dec-18 23:06 1 **PFHpS** 375-92-8 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 375-95-1 2.00 B8L0090 14-Dec-18 0.250 L **PFNA** ND 1.37 4.00 23-Dec-18 23:06 **PFOSA** 754-91-6 ND 1.37 2.00 B8L0090 14-Dec-18 0.250 L 4.00 23-Dec-18 23:06 **PFOS** 1763-23-1 2.00 B8L0090 14-Dec-18 0.250 L ND 1.37 4.00 23-Dec-18 23:06 PFDA 335-76-2 ND 1.37 2.00 0.250 L 4.00 B8L0090 14-Dec-18 23-Dec-18 23:06 8:2 FTS 39108-34-4 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 **PFNS** 68259-12-1 ND 1.94 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 MeFOSAA 2355-31-9 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 **EtFOSAA** 2991-50-6 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 **PFUnA** 2058-94-8 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 **PFDS** 335-77-3 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 **PFDoA** 307-55-1 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 **PFTrDA** 72629-94-8 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 **PFTeDA** 376-06-7 ND 1.37 2.00 4.00 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 **Labeled Standards** Type % Recovery Limits **Oualifiers** Batch **Extracted** Samp Size Analyzed Dilution IS 60 - 130 13C3-PFBA 101 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 13C3-PFPeA IS 98.0 60 - 150 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 IS 13C3-PFBS 101 60 - 150 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 13C2-4:2 FTS IS 85.9 40 - 150 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 13C2-PFHxA IS 100 70 - 130B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 13C4-PFHpA IS 105 60 - 150 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 18O2-PFHxS IS 110 60 - 130 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 13C2-6:2 FTS IS 98.2 40 - 150 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 1 13C2-PFOA IS 89.5 60 - 130 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 13C5-PFNA IS 92.2 50 - 130 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 1 13C8-PFOSA IS 42.6 20 - 150 B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 13C8-PFOS IS 101 60 - 130B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06 1 13C2-PFDA IS 87.5 60 - 130B8L0090 14-Dec-18 0.250 L 23-Dec-18 23:06

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Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Aqueous Lab Sample: B8L0090-BLK1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	74.9	40 - 150		B8L0090	14-Dec-18	0.250 L	23-Dec-18 23:06	1
d3-MeFOSAA	IS	82.3	50 - 150		B8L0090	14-Dec-18	0.250 L	23-Dec-18 23:06	1
d5-EtFOSAA	IS	93.7	50 - 150		B8L0090	14-Dec-18	0.250 L	23-Dec-18 23:06	1
13C2-PFUnA	IS	76.5	60 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 23:06	1
13C2-PFDoA	IS	77.5	30 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 23:06	1
13C2-PFTeDA	IS	67.3	20 - 150		B8L0090	14-Dec-18	0.250 L	23-Dec-18 23:06	1

DL - Detection Limit LOD - Limit of Detection Results reported to the DL. When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both LOQ - Limit of quantitation linear and branched isomers. Only the linear isomer is reported for all other

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Work Order 1803583 Revision 2 Page 12 of 39



Sample ID: OPR

PFAS Isotope Dilution Method

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Aqueous Lab Sample: B8L0090-BS1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation

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Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	40.1	40.0	100	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFPeA	2706-90-3	38.0	40.0	95.1	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFBS	375-73-5	41.6	40.0	104	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
4:2 FTS	757124-72-4	40.1	40.0	100	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFHxA	307-24-4	38.3	40.0	95.8	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFPeS	2706-91-4	39.4	40.0	98.6	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFHpA	375-85-9	39.3	40.0	98.3	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFHxS	355-46-4	39.5	40.0	98.8	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
6:2 FTS	27619-97-2	38.2	40.0	95.5	60 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFOA	335-67-1	42.3	40.0	106	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFHpS	375-92-8	40.2	40.0	101	60 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFNA	375-95-1	35.9	40.0	89.8	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFOSA	754-91-6	33.9	40.0	84.7	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFOS	1763-23-1	37.9	40.0	94.7	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFDA	335-76-2	37.9	40.0	94.8	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
8:2 FTS	39108-34-4	43.4	40.0	108	60 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFNS	68259-12-1	37.0	40.0	92.4	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
MeFOSAA	2355-31-9	33.6	40.0	84.1	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
EtFOSAA	2991-50-6	38.2	40.0	95.4	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFUnA	2058-94-8	39.8	40.0	99.4	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFDS	335-77-3	31.3	40.0	78.2	60 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFDoA	307-55-1	43.9	40.0	110	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFTrDA	72629-94-8	39.5	40.0	98.9	60 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
PFTeDA	376-06-7	41.7	40.0	104	70 - 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
Labeled Standards		Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA		IS		94.9	60- 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
13C3-PFPeA		IS		99.1	60- 150		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
13C3-PFBS		IS		102	60- 150		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
13C2-4:2 FTS		IS		87.4	40- 150		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
13C2-PFHxA		IS		97.0	70- 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
13C4-PFHpA		IS		94.5	60- 150		B8L0090		0.250 L	23-Dec-18 22:55	
18O2-PFHxS		IS		111	60- 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
13C2-6:2 FTS		IS		89.8	40- 150		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
13C2-PFOA		IS		85.9	60- 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
13C5-PFNA		IS		85.2	50- 130		B8L0090	14-Dec-18	0.250 L	23-Dec-18 22:55	1
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Sample ID: OPR

PFAS Isotope Dilution Method

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Aqueous Lab Sample: B8L0090-BS1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation

Labeled Standards Type % Rec Limits Qualifiers Samp Size Analyzed **Dilution** Batch Extracted 13C8-PFOSA IS 53.5 20- 150 B8L0090 14-Dec-18 0.250 L 23-Dec-18 22:55 60-130 13C8-PFOS IS 86.3 B8L0090 14-Dec-18 0.250 L 23-Dec-18 22:55 1 IS 80.9 60-130 14-Dec-18 13C2-PFDA B8L0090 0.250 L 23-Dec-18 22:55 40- 150 13C2-8:2 FTS IS 69.6 B8L0090 14-Dec-18 0.250~L23-Dec-18 22:55 1 IS 0.250 L d3-MeFOSAA 74.3 50-150 B8L0090 14-Dec-18 23-Dec-18 22:55 14-Dec-18 d5-EtFOSAA IS 75.6 50- 150 B8L0090 0.250 L 23-Dec-18 22:55 1 13C2-PFUnA 14-Dec-18 IS 75.0 60-130 B8L0090 0.250 L 23-Dec-18 22:55 13C2-PFDoA IS 73.2 30-130 B8L0090 14-Dec-18 0.250 L 23-Dec-18 22:55 1 13C2-PFTeDA IS 67.6 20-150 B8L0090 14-Dec-18 0.250 L 23-Dec-18 22:55

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Sample ID: W	W1810310815GC								PFAS Iso	tope Dilution N	Method
Client Data Name: Project: Location:	Merit Laboratories, Inc. Statewide WWTP Biosolids PFAS Evaluation IONA-MI0021041-EFPT1	Matrix: Date Colle		astewater -Oct-18 08:15	Lab	oratory Data Sample: Received:	1803583-0 09-Nov-18		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	34.9	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
PFPeA	2706-90-3	31.3	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	
PFBS	375-73-5	2.43	1.47	2.15	4.30	J	B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	
4:2 FTS	757124-72-4	154	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
PFHxA	307-24-4	66.0	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
PFPeS	2706-91-4	ND	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	
PFHpA	375-85-9	34.0	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
PFHxS	355-46-4	2.05	1.47	2.15	4.30	J	B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
6:2 FTS	27619-97-2	142000	294	430	860	D	B8K0194	28-Nov-18	0.233 L	07-Dec-18 21:36	200
PFOA	335-67-1	ND	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
PFHpS	375-92-8	ND	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
PFNA	375-95-1	ND	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	
PFOSA	754-91-6	ND	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	
PFOS	1763-23-1	635	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	
PFDA	335-76-2	ND	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	
8:2 FTS	39108-34-4	400	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
PFNS	68259-12-1	ND	2.08	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
MeFOSAA	2355-31-9	ND	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
EtFOSAA	2991-50-6	ND	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
PFUnA	2058-94-8	ND	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	
PFDS	335-77-3	ND	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	
PFDoA	307-55-1	ND	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
PFTrDA	72629-94-8	ND	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
PFTeDA	376-06-7	ND	1.47	2.15	4.30		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	
Labeled Standar		% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBA	IS	97.3		60 - 130			B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
13C3-PFPeA	IS	98.2		60 - 150			B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
13C3-PFBS	IS	102		60 - 150			B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
13C2-4:2 FTS	IS	97.4		40 - 150			B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
13C2-PFHxA	IS	96.0		70 - 130			B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
13C4-PFHpA	IS	99.9		60 - 150			B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
18O2-PFHxS	IS	103		60 - 130			B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
13C2-6:2 FTS	IS	12600		40 - 150		D, H	B8K0194	28-Nov-18	0.233 L	07-Dec-18 21:36	200
13C2-PFOA	IS	83.1		60 - 130		D	B8K0194	28-Nov-18	0.233 L	07-Dec-18 21:36	200
13C5-PFNA	IS	78.8		50 - 130			B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
13C8-PFOSA	IS	66.3		20 - 150			B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	
13C8-PFOS	IS	90.4		60 - 130			B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	

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Sample ID: W	W1810310815GC						PFAS Iso	tope Dilution N	Aethod
Client Data Name: Project: Location:	Merit Laboratories, Inc. Statewide WWTP Biosolids PFAS Evaluation IONA-MI0021041-EFPT1	Matrix: Date Collected:	Wastewater 31-Oct-18 08:15	Laboratory Data Lab Sample: Date Received:	1803583-0 09-Nov-18		Column:	BEH C18	
Labeled Standard	ds Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	112	40 - 150		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
d3-MeFOSAA	IS	60.0	50 - 150		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
d5-EtFOSAA	IS	63.1	50 - 150		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
13C2-PFUnA	IS	63.1	60 - 130		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
13C2-PFDoA	IS	53.3	30 - 130		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	1
13C2-PFTeDA	IS	38.2	20 - 150		B8K0194	28-Nov-18	0.233 L	30-Nov-18 00:32	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 analyses.

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Sample ID: W	/W1810310800GC								PFAS Iso	tope Dilution N	Method
Client Data Name:	Merit Laboratories, Inc.	Matrix:	Waste	ewater		oratory Data Sample:	1803583-0	12	Column:	DEIL C10	,
Project: Location:	Statewide WWTP Biosolids PFAS Evaluation IONA-MI0021041-IFPT1	Date Col		ct-18 08:00		Received:	09-Nov-18		Column.	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	5.09	1.53	2.23	4.46		B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	1
PFPeA	2706-90-3	4.27	1.53	2.23	4.46	J		28-Nov-18	0.224 L	30-Nov-18 01:04	
PFBS	375-73-5	2.03	1.53	2.23	4.46	J	B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	1
4:2 FTS	757124-72-4	42.2	1.53	2.23	4.46			28-Nov-18	0.224 L	30-Nov-18 01:04	
PFHxA	307-24-4	5.16	1.53	2.23	4.46			28-Nov-18	0.224 L	30-Nov-18 01:04	
PFPeS	2706-91-4	ND	1.53	2.23	4.46		B8K0194		0.224 L	30-Nov-18 01:04	
PFHpA	375-85-9	6.34	1.53	2.23	4.46			28-Nov-18	0.224 L	30-Nov-18 01:04	
PFHxS	355-46-4	ND	1.53	2.23	4.46		B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	
6:2 FTS	27619-97-2	8280	15.3	22.3	44.6	D		28-Nov-18	0.224 L	16-Dec-18 21:00	
PFOA	335-67-1	ND	1.53	2.23	4.46			28-Nov-18	0.224 L	30-Nov-18 01:04	
PFHpS	375-92-8	ND	1.53	2.23	4.46			28-Nov-18	0.224 L	30-Nov-18 01:04	
PFNA	375-95-1	ND	1.53	2.23	4.46			28-Nov-18	0.224 L	30-Nov-18 01:04	
PFOSA	754-91-6	ND	1.53	2.23	4.46			28-Nov-18	0.224 L	30-Nov-18 01:04	
PFOS	1763-23-1	213	1.53	2.23	4.46			28-Nov-18	0.224 L	30-Nov-18 01:04	
PFDA	335-76-2	ND	1.53	2.23	4.46			28-Nov-18	0.224 L	30-Nov-18 01:04	
8:2 FTS	39108-34-4	109	1.53	2.23	4.46		B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	
PFNS	68259-12-1	ND	2.16	2.23	4.46				0.224 L	30-Nov-18 01:04	
MeFOSAA	2355-31-9	ND	1.53	2.23	4.46		B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	
EtFOSAA	2991-50-6	ND	1.53	2.23	4.46			28-Nov-18	0.224 L	30-Nov-18 01:04	
PFUnA	2058-94-8	ND	1.53	2.23	4.46			28-Nov-18	0.224 L 0.224 L	30-Nov-18 01:04	
PFDS	335-77-3	ND	1.53	2.23	4.46			28-Nov-18	0.224 L 0.224 L	30-Nov-18 01:04	
PFDoA	307-55-1	ND	1.53	2.23	4.46		B8K0194		0.224 L 0.224 L	30-Nov-18 01:04	
PFTrDA	72629-94-8	ND ND	1.53	2.23	4.46			28-Nov-18	0.224 L 0.224 L		
PFTeDA	376-06-7	ND	1.53	2.23	4.46		B8K0194	28-Nov-18	0.224 L 0.224 L	30-Nov-18 01:04 30-Nov-18 01:04	
Labeled Standar		% Recovery	1.33	Limits	4.40	Qualifiers	Batch	Extracted	Samp Size		Dilutio
13C3-PFBA	IS	94.7		60 - 130			B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	
13C3-PFPeA	IS	94.1		60 - 150			B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	
13C3-PFBS	IS	95.9		60 - 150				28-Nov-18	0.224 L	30-Nov-18 01:04	
13C2-4:2 FTS	IS	86.0		40 - 150			B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	
13C2-PFHxA	IS	95.0		70 - 130				28-Nov-18	0.224 L	30-Nov-18 01:04	
13C4-PFHpA	IS	89.3		60 - 150				28-Nov-18	0.224 L	30-Nov-18 01:04	
18O2-PFHxS	IS	106		60 - 130				28-Nov-18		30-Nov-18 01:04	
13C2-6:2 FTS	IS	85.9		40 - 150		D		28-Nov-18	0.224 L 0.224 L	16-Dec-18 21:00	
13C2-PFOA	IS	88.9		60 - 130		D		28-Nov-18	0.224 L 0.224 L	30-Nov-18 01:04	
13C5-PFNA	IS	79.2		50 - 130				28-Nov-18	0.224 L 0.224 L	30-Nov-18 01:04 30-Nov-18 01:04	
13C8-PFOSA	IS IS	54.1									
13C8-PFOSA				20 - 150 60 - 130				28-Nov-18	0.224 L	30-Nov-18 01:04	
	IS	73.1						28-Nov-18	0.224 L	30-Nov-18 01:04	
13C2-PFDA	IS	66.8		60 - 130			B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	1

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Sample ID: W	W1810310800GC						PFAS Iso	tope Dilution M	1ethod
Client Data Name: Project: Location:	Merit Laboratories, Inc. Statewide WWTP Biosolids PFAS Evaluation IONA-MI0021041-IFPT1	Matrix: Date Collected:	Wastewater 31-Oct-18 08:00	Laboratory Data Lab Sample: Date Received:	1803583-0 09-Nov-18		Column:	BEH C18	
Labeled Standard	ds Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	74.8	40 - 150		B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	1
d3-MeFOSAA	IS	50.7	50 - 150		B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	1
d5-EtFOSAA	IS	51.3	50 - 150		B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	1
13C2-PFUnA	IS	51.6	60 - 130	Н	B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	1
13C2-PFDoA	IS	39.0	30 - 130		B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	1
13C2-PFTeDA	IS	26.7	20 - 150		B8K0194	28-Nov-18	0.224 L	30-Nov-18 01:04	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.

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Sample ID: BS1810310830GC-A **PFAS Isotope Dilution Method Client Data** Laboratory Data Name: Merit Laboratories, Inc. Matrix: Aqueous Lab Sample: 1803583-05 Column: BEH C18 Statewide WWTP Biosolids PFAS Evaluation Date Collected: 31-Oct-18 08:30 Project: Date Received: 09-Nov-18 09:41 Location: IONA-MI0021041-STAND Conc. (ng/L) DLLOD LOQ Batch Extracted Samp Size **Qualifiers** Analyzed **CAS Number** Dilution Analyte **PFBA** 375-22-4 87.8 2.83 4.13 8.27 B8L0090 14-Dec-18 23-Dec-18 23:17 0.121 L **PFPeA** 2706-90-3 89.9 8.27 2.83 4.13 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 **PFBS** 375-73-5 ND 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 2.83 8.27 4:2 FTS 757124-72-4 116 4.13 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 **PFHxA** 307-24-4 251 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 **PFPeS** 2706-91-4 ND 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 **PFHpA** 375-85-9 34.7 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 3.91 14-Dec-18 **PFHxS** 355-46-4 2.83 4.13 8.27 J B8L0090 0.121 L 23-Dec-18 23:17 1 154000 142 207 414 6:2 FTS 27619-97-2 D B8L0090 14-Dec-18 0.121 L 01-Jan-19 06:23 50 **PFOA** 335-67-1 10.1 4.13 B8L0090 14-Dec-18 0.121 L 2.83 8.27 23-Dec-18 23:17 1 **PFHpS** 375-92-8 10.6 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 375-95-1 3.66 4.13 B8L0090 14-Dec-18 **PFNA** 2.83 8.27 J 0.121 L 23-Dec-18 23:17 1 **PFOSA** 754-91-6 ND 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 **PFOS** 1763-23-1 2920 4.13 8.27 B8L0090 14-Dec-18 0.121 L 2.83 23-Dec-18 23:17 PFDA 335-76-2 ND 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 8:2 FTS 39108-34-4 605 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 ND 4.13 **PFNS** 68259-12-1 4.00 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 MeFOSAA 2355-31-9 4.54 2.83 4.13 8.27 J B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 **EtFOSAA** 2991-50-6 ND 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 **PFUnA** 2058-94-8 ND 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 **PFDS** 335-77-3 ND 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 PFDoA 307-55-1 ND 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 **PFTrDA** 72629-94-8 ND 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 **PFTeDA** 376-06-7 ND 2.83 4.13 8.27 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 **Labeled Standards** Type % Recovery Limits **Oualifiers** Batch **Extracted** Samp Size Analyzed Dilution IS 99.9 60 - 130 13C3-PFBA B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 IS 13C3-PFPeA 106 60 - 150 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 IS 13C3-PFBS 106 60 - 150 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 IS 13C2-4:2 FTS 90.1 40 - 150 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 13C2-PFHxA IS 99.9 70 - 130B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 IS 13C4-PFHpA 105 60 - 150 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 18O2-PFHxS IS 118 60 - 130 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 D, H 13C2-6:2 FTS IS 534 40 - 150 B8L0090 14-Dec-18 0.121 L 01-Jan-19 06:23 50 13C2-PFOA IS 108 60 - 130 D B8L0090 14-Dec-18 0.121 L 01-Jan-19 06:23 50 13C5-PFNA IS 82.5 50 - 130 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 1 13C8-PFOSA IS 58.9 20 - 150 B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 13C8-PFOS IS 67.1 60 - 130B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17 1 13C2-PFDA IS 70.2 60 - 130B8L0090 14-Dec-18 0.121 L 23-Dec-18 23:17

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Sample ID: BS	51810310830GC-A						PFAS Iso	tope Dilution N	Aethod
Client Data Name: Project: Location:	Merit Laboratories, Inc. Statewide WWTP Biosolids PFAS Evaluation IONA-MI0021041-STAND	Matrix: Date Collected:	Aqueous 31-Oct-18 08:30	Laboratory Data Lab Sample: Date Received:	1803583-0 09-Nov-18		Column:	BEH C18	
Labeled Standard	ds Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	85.7	40 - 150		B8L0090	14-Dec-18	0.121 L	23-Dec-18 23:17	1
d3-MeFOSAA	IS	65.6	50 - 150		B8L0090	14-Dec-18	0.121 L	23-Dec-18 23:17	1
d5-EtFOSAA	IS	85.0	50 - 150		B8L0090	14-Dec-18	0.121 L	23-Dec-18 23:17	1
13C2-PFUnA	IS	59.9	60 - 130	Н	B8L0090	14-Dec-18	0.121 L	23-Dec-18 23:17	1
13C2-PFDoA	IS	57.1	30 - 130		B8L0090	14-Dec-18	0.121 L	23-Dec-18 23:17	1
13C2-PFTeDA	IS	58.6	20 - 150		B8L0090	14-Dec-18	0.121 L	23-Dec-18 23:17	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.

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Sample ID: Method Blank VAL - PFAS

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Solid Lab Sample: B8K0155-BLK1 Column: BEH C18
Project: Statewide WWTP Biosolids PFAS Evaluation

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		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFPeA	2706-90-3	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFBS	375-73-5	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
4:2 FTS	757124-72-4	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFHxA	307-24-4	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFPeS	2706-91-4	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFHpA	375-85-9	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFHxS	355-46-4	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
6:2 FTS	27619-97-2	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFOA	335-67-1	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFHpS	375-92-8	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFNA	375-95-1	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFOSA	754-91-6	ND	0.845	1.00	2.00			25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFOS	1763-23-1	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFDA	335-76-2	ND	0.845	1.00	2.00			25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
8:2 FTS	39108-34-4	ND	0.845	1.00	2.00			25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFNS	68259-12-1	ND	1.43	1.50	2.00			25-Nov-18	1.00 g	29-Nov-18 03:08	
MeFOSAA	2355-31-9	ND	0.845	1.00	2.00			25-Nov-18	1.00 g	29-Nov-18 03:08	
EtFOSAA	2991-50-6	ND	0.845	1.00	2.00			25-Nov-18	1.00 g	29-Nov-18 03:08	
PFUnA	2058-94-8	ND	0.845	1.00	2.00			25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFDS	335-77-3	ND	0.845	1.00	2.00			25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFDoA	307-55-1	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
PFTrDA	72629-94-8	ND	0.845	1.00	2.00			25-Nov-18	1.00 g	29-Nov-18 03:08	
PFTeDA	376-06-7	ND	0.845	1.00	2.00		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	
Labeled Standards	Type	% Recovery		Limits		Qualifiers	Batch		Samp Size		Dilution
13C3-PFBA	IS	65.0		60 - 130			B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1
13C3-PFPeA	IS	66.4		60 - 150				25-Nov-18	1.00 g	29-Nov-18 03:08	
13C3-PFBS	IS	68.0		60 - 150				25-Nov-18	1.00 g	29-Nov-18 03:08	
13C2-4:2 FTS	IS	50.4		40 - 150				25-Nov-18	1.00 g	29-Nov-18 03:08	
13C2-PFHxA	IS	69.6		70 - 130		Н		25-Nov-18	1.00 g	29-Nov-18 03:08	
13C4-PFHpA	IS	62.8		60 - 150				25-Nov-18	1.00 g	29-Nov-18 03:08	
18O2-PFHxS	IS	71.5		60 - 130				25-Nov-18	1.00 g	29-Nov-18 03:08	
13C2-6:2 FTS	IS	50.5		40 - 150				25-Nov-18	1.00 g	29-Nov-18 03:08	
13C2-PFOA	IS	68.2		60 - 130				25-Nov-18	1.00 g	29-Nov-18 03:08	
13C5-PFNA	IS	63.9		50 - 130				25-Nov-18	1.00 g	29-Nov-18 03:08	
13C8-PFOSA	IS	50.1		20 - 150				25-Nov-18	1.00 g	29-Nov-18 03:08	
13C8-PFOS	IS	75.5		60 - 130			BSKULSS	25-Nov-18	1.00 g	29-Nov-18 03:08	8 1

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Sample ID: Method Blank
VAL - PFAS

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Solid Lab Sample: B8K0155-BLK1 Column: BEH C18
Project: Statewide WWTP Biosolids PFAS Evaluation

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	57.4	40 - 150		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	1
d3-MeFOSAA	IS	44.7	50 - 150	Н	B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	1
d5-EtFOSAA	IS	49.8	50 - 150	Н	B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	1
13C2-PFUnA	IS	56.6	60 - 130	Н	B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	1
13C2-PFDoA	IS	56.6	30 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	1
13C2-PFTeDA	IS	58.0	20 - 150		B8K0155	25-Nov-18	1.00 g	29-Nov-18 03:08	1

DL - Detection Limit

LOD - Limit of Detection

The results are reported in dry weight.

LOQ - Limit of quantitation

The sample size is reported in wet weight.

Results reported in wet weight.

Results 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.

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Sample ID: OPR

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Solid Lab Sample: B8K0155-BS1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation

Analyte	CAS Number	Amt Found (ng/g)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	10.5	10.0	105	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFPeA	2706-90-3	10.3	10.0	103	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFBS	375-73-5	9.85	10.0	98.5	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
4:2 FTS	757124-72-4	11.2	10.0	112	60 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFHxA	307-24-4	10.7	10.0	107	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFPeS	2706-91-4	10.2	10.0	102	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFHpA	375-85-9	10.1	10.0	101	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFHxS	355-46-4	9.84	10.0	98.4	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
6:2 FTS	27619-97-2	10.4	10.0	104	60 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFOA	335-67-1	9.98	10.0	99.8	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFHpS	375-92-8	9.81	10.0	98.1	60 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFNA	375-95-1	10.7	10.0	107	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFOSA	754-91-6	11.0	10.0	110	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFOS	1763-23-1	9.64	10.0	96.4	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFDA	335-76-2	10.9	10.0	109	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
8:2 FTS	39108-34-4	9.87	10.0	98.7	60 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFNS	68259-12-1	9.53	10.0	95.3	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
MeFOSAA	2355-31-9	10.4	10.0	104	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
EtFOSAA	2991-50-6	10.4	10.0	104	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFUnA	2058-94-8	10.6	10.0	106	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFDS	335-77-3	8.32	10.0	83.2	60 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFDoA	307-55-1	9.90	10.0	99.0	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFTrDA	72629-94-8	10.6	10.0	106	60 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
PFTeDA	376-06-7	9.71	10.0	97.1	70 - 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
Labeled Standards		Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA		IS		66.8	60- 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
13C3-PFPeA		IS		69.0	60- 150		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
13C3-PFBS		IS		72.6	60- 150		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
13C2-4:2 FTS		IS		59.2	40- 150		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
13C2-PFHxA		IS		70.7	70- 130			25-Nov-18	1.00 g	29-Nov-18 02:57	
13C4-PFHpA		IS		65.7	60- 150			25-Nov-18	1.00 g	29-Nov-18 02:57	1
18O2-PFHxS		IS		75.5	60- 130			25-Nov-18	1.00 g	29-Nov-18 02:57	1
13C2-6:2 FTS		IS		56.3	40- 150			25-Nov-18	1.00 g	29-Nov-18 02:57	1
13C2-PFOA		IS		73.9	60- 130			25-Nov-18	1.00 g	29-Nov-18 02:57	
13C5-PFNA		IS		65.5	50- 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
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Sample ID: OPR

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Solid Lab Sample: B8K0155-BS1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation

Labeled Standards	Туре	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOSA	IS	47.3	20- 150		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
13C8-PFOS	IS	79.3	60- 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
13C2-PFDA	IS	55.3	60- 130	Н	B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
13C2-8:2 FTS	IS	58.5	40- 150		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
d3-MeFOSAA	IS	45.1	50- 150	Н	B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
d5-EtFOSAA	IS	50.2	50- 150		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
13C2-PFUnA	IS	56.1	60- 130	Н	B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
13C2-PFDoA	IS	58.4	30- 130		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1
13C2-PFTeDA	IS	63.0	20- 150		B8K0155	25-Nov-18	1.00 g	29-Nov-18 02:57	1

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Sample ID: Method Blank VAL - PFAS

Client Data Laboratory Data

13C2-PFDA

IS

89.4

Name: Merit Laboratories, Inc. Matrix: Solid Lab Sample: B8L0089-BLK1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation

Conc. (ng/g) DLLOD LOQ **Qualifiers** Batch Extracted Samp Size **CAS Number** Analyzed Dilution Analyte **PFBA** 375-22-4 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 **PFPeA** ND 2706-90-3 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 **PFBS** 375-73-5 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 12-Dec-18 4:2 FTS 757124-72-4 ND 0.845 1.00 2.00 B8L0089 1.00 g 15-Dec-18 02:16 **PFHxA** 307-24-4 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 **PFPeS** 2706-91-4 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 **PFHpA** 375-85-9 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 12-Dec-18 **PFHxS** 355-46-4 ND 0.845 1.00 2.00 B8L0089 1.00 g15-Dec-18 02:16 1 6:2 FTS 27619-97-2 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g15-Dec-18 02:16 **PFOA** 335-67-1 1.00 B8L0089 12-Dec-18 ND 0.845 2.00 1.00 g15-Dec-18 02:16 1 **PFHpS** 375-92-8 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 B8L0089 12-Dec-18 **PFNA** 375-95-1 ND 0.845 1.00 2.00 1.00 g15-Dec-18 02:16 1 **PFOSA** 754-91-6 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g15-Dec-18 02:16 **PFOS** 1763-23-1 0.845 1.00 B8L0089 12-Dec-18 ND 2.00 1.00 g15-Dec-18 02:16 PFDA 335-76-2 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 8:2 FTS 39108-34-4 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 **PFNS** 68259-12-1 ND 1.43 1.50 2.00 B8L0089 12-Dec-18 1.00 g15-Dec-18 02:16 MeFOSAA 2355-31-9 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 **EtFOSAA** 2991-50-6 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 **PFUnA** 2058-94-8 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 **PFDS** 335-77-3 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 12-Dec-18 PFDoA 307-55-1 ND 0.845 1.00 2.00 B8L0089 1.00 g 15-Dec-18 02:16 **PFTrDA** 72629-94-8 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g15-Dec-18 02:16 **PFTeDA** 376-06-7 ND 0.845 1.00 2.00 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 **Labeled Standards** Type % Recovery Limits **Oualifiers** Batch **Extracted** Samp Size Analyzed Dilution IS 104 60 - 130 13C3-PFBA B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 IS 13C3-PFPeA 101 60 - 150 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 IS 13C3-PFBS 104 60 - 150 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 IS 92.2 13C2-4:2 FTS 40 - 150 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 13C2-PFHxA IS 98.1 70 - 130B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 IS 13C4-PFHpA 99.5 60 - 150 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 18O2-PFHxS IS 97.2 60 - 130 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 13C2-6:2 FTS IS 103 40 - 150 B8L0089 12-Dec-18 1.00 g15-Dec-18 02:16 1 13C2-PFOA IS 91.5 60 - 130 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 13C5-PFNA IS 82.9 50 - 130 B8L0089 12-Dec-18 1.00 g15-Dec-18 02:16 1 13C8-PFOSA IS 59.2 20 - 150 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:16 13C8-PFOS IS 92.2 60 - 130B8L0089 12-Dec-18 1.00 g15-Dec-18 02:16 1

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60 - 130

B8L0089

12-Dec-18

1.00 g

15-Dec-18 02:16



Sample ID: Method Blank
VAL - PFAS

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Solid Lab Sample: B8L0089-BLK1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	77.1	40 - 150		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:16	1
d3-MeFOSAA	IS	78.4	50 - 150		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:16	1
d5-EtFOSAA	IS	74.1	50 - 150		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:16	1
13C2-PFUnA	IS	69.6	60 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:16	1
13C2-PFDoA	IS	66.6	30 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:16	1
13C2-PFTeDA	IS	69.1	20 - 150		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:16	1

DL - Detection Limit LOD - Limit of Detection The results are reported in dry weight. When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both LOQ - Limit of quantitation The sample size is reported in wet weight. linear and branched isomers. Only the linear isomer is reported for all other

Results reported to the DL.

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Sample ID: OPR

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Solid Lab Sample: B8L0089-BS1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation

Analyte	CAS Number	Amt Found (ng/g)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	10.1	10.0	101	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFPeA	2706-90-3	10.0	10.0	100	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFBS	375-73-5	9.52	10.0	95.2	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
4:2 FTS	757124-72-4	10.4	10.0	104	60 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFHxA	307-24-4	9.76	10.0	97.6	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFPeS	2706-91-4	9.30	10.0	93.0	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFHpA	375-85-9	9.90	10.0	99.0	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFHxS	355-46-4	10.5	10.0	105	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
6:2 FTS	27619-97-2	9.75	10.0	97.5	60 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFOA	335-67-1	11.2	10.0	112	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFHpS	375-92-8	9.70	10.0	97.0	60 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFNA	375-95-1	10.1	10.0	101	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFOSA	754-91-6	8.91	10.0	89.1	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFOS	1763-23-1	9.72	10.0	97.2	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFDA	335-76-2	9.50	10.0	95.0	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
8:2 FTS	39108-34-4	10.9	10.0	109	60 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFNS	68259-12-1	9.00	10.0	90.0	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
MeFOSAA	2355-31-9	8.49	10.0	84.9	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
EtFOSAA	2991-50-6	9.13	10.0	91.3	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFUnA	2058-94-8	9.74	10.0	97.4	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFDS	335-77-3	9.21	10.0	92.1	60 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFDoA	307-55-1	11.7	10.0	117	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFTrDA	72629-94-8	11.0	10.0	110	60 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
PFTeDA	376-06-7	11.6	10.0	116	70 - 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
Labeled Standards		Туре		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA		IS		108	60- 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
13C3-PFPeA		IS		102	60- 150		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
13C3-PFBS		IS		108	60- 150		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
13C2-4:2 FTS		IS		95.2	40- 150		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
13C2-PFHxA		IS		101	70- 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	
13C4-PFHpA		IS		103	60- 150		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	
18O2-PFHxS		IS		104	60- 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	
13C2-6:2 FTS		IS		100	40- 150		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
13C2-PFOA		IS		89.4	60- 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	
13C5-PFNA		IS		83.0	50- 130		B8L0089	12-Dec-18	1.00 g	15-Dec-18 02:05	1
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Sample ID: OPR

VAL - PFAS

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Solid Lab Sample: B8L0089-BS1 Column: BEH C18

Project: Statewide WWTP Biosolids PFAS Evaluation

Labeled Standards Type % Rec Limits Qualifiers Analyzed **Dilution** Batch Extracted Samp Size 13C8-PFOSA IS 64.4 20- 150 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:05 60-130 1.00 g 13C8-PFOS IS 100 B8L0089 12-Dec-18 15-Dec-18 02:05 1 IS 60-130 12-Dec-18 13C2-PFDA 84.1 B8L0089 1.00 g 15-Dec-18 02:05 40- 150 13C2-8:2 FTS IS 78.9 B8L0089 12-Dec-18 15-Dec-18 02:05 1.00 g 1 d3-MeFOSAA IS 50- 150 12-Dec-18 91.6 B8L0089 1.00 g 15-Dec-18 02:05 d5-EtFOSAA IS 86.7 50-150 B8L0089 12-Dec-18 1.00 g 1 15-Dec-18 02:05 13C2-PFUnA 60-130 12-Dec-18 IS 1.00 g 76.4 B8L0089 15-Dec-18 02:05 1.00 g 13C2-PFDoA IS 69.7 30- 130 B8L0089 12-Dec-18 15-Dec-18 02:05 1 13C2-PFTeDA 20-150 IS 76.8 B8L0089 12-Dec-18 1.00 g 15-Dec-18 02:05

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Sample ID: BS1810310830GC VAL - PFAS **Client Data** Laboratory Data Name: Merit Laboratories, Inc. Matrix: Biosolid Lab Sample: 1803583-03 Column: BEH C18 Statewide WWTP Biosolids PFAS Evaluation Date Collected: Project: 31-Oct-18 08:30 Date Received: 09-Nov-18 09:41 Location: IONA-MI0021041-STAND 0.793 % Solids: Conc. (ng/g) DLLOD LOQ Extracted Samp Size **Qualifiers Batch** Analyzed **CAS Number** Dilution Analyte **PFBA** 375-22-4 10.8 0.837 0.991 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 **PFPeA** 2706-90-3 0.837 0.991 11.7 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 **PFBS** 0.991 375-73-5 ND 0.837 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 0.991 4:2 FTS 757124-72-4 16.8 0.837 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 **PFHxA** 307-24-4 37.5 0.837 0.991 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 **PFPeS** 2706-91-4 ND 0.837 0.991 1.98 25-Nov-18 127 g B8K0155 29-Nov-18 03:18 0.991 **PFHpA** 375-85-9 5.28 0.837 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 B8K0155 25-Nov-18 **PFHxS** 355-46-4 ND 0.837 0.991 1.98 127 g 29-Nov-18 03:18 1 27619-97-2 23200 99.1 6:2 FTS 41.9 49.6 I.D B8K0155 25-Nov-18 127 g 30-Nov-18 13:27 50 **PFOA** 335-67-1 1.45 0.837 0.991 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 1 **PFHpS** 375-92-8 2.07 0.837 0.991 1.98 B8K0155 25-Nov-18 29-Nov-18 03:18 127 g 375-95-1 0.881 0.991 B8K0155 25-Nov-18 **PFNA** 0.837 1.98 J 127 g 29-Nov-18 03:18 1 **PFOSA** 754-91-6 ND 0.991 1.98 B8K0155 25-Nov-18 127 g 0.837 29-Nov-18 03:18 **PFOS** 1763-23-1 1220 4.96 D B8K0155 25-Nov-18 5 4.19 9.91 127 g 30-Nov-18 10:54 PFDA 335-76-2 ND 0.837 0.991 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 8:2 FTS 39108-34-4 55.4 4.19 4.96 9.91 D B8K0155 25-Nov-18 127 g 30-Nov-18 10:54 5 ND **PFNS** 68259-12-1 1.42 1.49 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 MeFOSAA 2355-31-9 9.95 0.837 0.991 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 5.23 0.991 **EtFOSAA** 2991-50-6 0.837 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 **PFUnA** 2058-94-8 ND 0.837 0.991 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 **PFDS** 335-77-3 ND 0.837 0.991 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 PFDoA 307-55-1 ND 0.837 0.991 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 **PFTrDA** 72629-94-8 ND 0.837 0.991 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 **PFTeDA** 376-06-7 ND 0.837 0.991 1.98 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 **Labeled Standards** Type % Recovery Limits **Oualifiers** Batch **Extracted** Samp Size Analyzed Dilution IS 60 - 130 Η 13C3-PFBA 4.50 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 IS 60 - 150 Н 13C3-PFPeA 24.8 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 IS 13C3-PFBS 73.3 60 - 150 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 IS 50.5 13C2-4:2 FTS 40 - 150 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 13C2-PFHxA IS 69.5 70 - 130Η B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 IS 13C4-PFHpA 73.1 60 - 150 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 IS 18O2-PFHxS 89.7 60 - 130 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 13C2-6:2 FTS IS 8590 40 - 150 D, H B8K0155 25-Nov-18 127 g 30-Nov-18 13:27 50 13C2-PFOA IS 83.5 60 - 130 D B8K0155 25-Nov-18 127 g 30-Nov-18 13:27 50 13C5-PFNA IS 84.6 50 - 130 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 1 13C8-PFOSA IS 87.4 20 - 150 B8K0155 25-Nov-18 127 g 29-Nov-18 03:18 13C8-PFOS IS 88.5 60 - 130D B8K0155 25-Nov-18 127 g 30-Nov-18 10:54 5 13C2-PFDA IS 76.3 60 - 130B8K0155 25-Nov-18 127 g 29-Nov-18 03:18

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Sample ID: BS	1810310830GC							VAL	- PFAS
Client Data				Laboratory Data					
Name:	Merit Laboratories, Inc.	Matrix:	Biosolid	Lab Sample:	1803583-0	1803583-03		BEH C18	
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	31-Oct-18 08:30	Date Received:	09-Nov-18	09-Nov-18 09:41			
Location:	IONA-MI0021041-STAND			% Solids:	0.793				
Labeled Standard	ls Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	221	40 - 150	D, H	B8K0155	25-Nov-18	127 g	30-Nov-18 10:54	5
d3-MeFOSAA	IS	46.8	50 - 150	Н	B8K0155	25-Nov-18	127 g	29-Nov-18 03:18	1
d5-EtFOSAA	IS	60.3	50 - 150		B8K0155	25-Nov-18	127 g	29-Nov-18 03:18	. 1
13C2-PFUnA	IS	65.5	60 - 130		B8K0155	25-Nov-18	127 g	29-Nov-18 03:18	. 1
13C2-PFDoA	IS	25.4	30 - 130	Н	B8K0155	25-Nov-18	127 g	29-Nov-18 03:18	. 1
13C2-PFTeDA	IS	8.70	20 - 150	Н	B8K0155	25-Nov-18	127 g	29-Nov-18 03:18	. 1
DL - Detection Limit	LOD - Limit of Detection LOQ - Limit of quantitation	The results are repor The sample size is re	ted in dry weight. eported in wet weight.					FOSAA include both orted for all other	

analytes.

Results reported to the DL.

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Client Data					Laho	ratory Data					
Name:	Merit Laboratories, Inc.	Matrix:	Bioso	lid			1803583-0	14	Column:	DEIL C10	
Project:			Date Collected: 31-Oct-18 08:30			•			Column.	BEH C18	
Location:	IONA-MI0021041-STAND	24.0 00.	31 0	20 10 00.50				00.11			
Analyte		70 BOILES.		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
PFBA	375-22-4	ND	0.837	0.990	1.98	- Quantities	B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFPeA	2706-90-3	ND	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFBS	375-73-5	ND	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
4:2 FTS	757124-72-4	ND	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFHxA	307-24-4	4.36	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFPeS	2706-91-4	ND	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFHpA	375-85-9	ND	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFHxS	355-46-4	ND	0.837	0.990	1.98		B8L0089	12-Dec-18	-	15-Dec-18 02:37	
6:2 FTS	27619-97-2	2050	4.18		9.90	D			127 g		
				4.95		Д	B8L0089	12-Dec-18	127 g	16-Dec-18 19:14	
PFOA	335-67-1	ND	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFHpS	375-92-8	ND	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFNA	375-95-1	ND	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFOSA	754-91-6	ND	0.837	0.990	1.98	D	B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFOS	1763-23-1	983	4.18	4.95	9.90	D	B8L0089	12-Dec-18	127 g	16-Dec-18 19:14	
PFDA	335-76-2	ND	0.837	0.990	1.98	-	B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
8:2 FTS	39108-34-4	136	4.18	4.95	9.90	D	B8L0089	12-Dec-18	127 g	16-Dec-18 19:14	
PFNS	68259-12-1	ND	1.42	1.49	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
MeFOSAA	2355-31-9	7.07	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
EtFOSAA	2991-50-6	4.44	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFUnA	2058-94-8	ND	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFDS	335-77-3	6.91	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFDoA	307-55-1	ND	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFTrDA	72629-94-8	ND	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
PFTeDA	376-06-7	ND	0.837	0.990	1.98		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	1
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	97.6		60 - 130			B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
13C3-PFPeA	IS	97.6		60 - 150			B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
13C3-PFBS	IS	88.6		60 - 150			B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
13C2-4:2 FTS	IS	66.7		40 - 150			B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
13C2-PFHxA	IS	93.9		70 - 130			B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	1
13C4-PFHpA	IS	96.3		60 - 150			B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	
18O2-PFHxS	IS	93.5		60 - 130				12-Dec-18	127 g	15-Dec-18 02:37	
13C2-6:2 FTS	IS	106		40 - 150		D	B8L0089	12-Dec-18	127 g	16-Dec-18 19:14	1 5
13C2-PFOA	IS	84.3		60 - 130			B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	7 1
13C5-PFNA	IS	80.8		50 - 130			B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	7 1
13C8-PFOSA	IS	71.6		20 - 150			B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	7 1
13C8-PFOS	IS	81.4		60 - 130		D	B8L0089	12-Dec-18	127 g	16-Dec-18 19:14	1 5
	IS	85.0		60 - 130				12-Dec-18	127 g	15-Dec-18 02:37	

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Sample ID: BS	1810310830GC-S							VAL ·	- PFAS
Client Data Name: Project: Location:	Merit Laboratories, Inc. Statewide WWTP Biosolids PFAS Evaluation IONA-MI0021041-STAND	Matrix: Date Collected:	Biosolid 31-Oct-18 08:30	Laboratory Data Lab Sample: Date Received: % Solids:	1803583-0 09-Nov-18 0.794		Column:	ВЕН С18	
Labeled Standard	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	169	40 - 150	D, H	B8L0089	12-Dec-18	127 g	16-Dec-18 19:14	5
d3-MeFOSAA	IS	50.5	50 - 150		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	1
d5-EtFOSAA	IS	56.5	50 - 150		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	1
13C2-PFUnA	IS	71.9	60 - 130		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	1
13C2-PFDoA	IS	23.7	30 - 130	Н	B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	1
13C2-PFTeDA	IS	44.6	20 - 150		B8L0089	12-Dec-18	127 g	15-Dec-18 02:37	1

DL - Detection Limit

LOD - Limit of Detection

The results are reported in dry weight.

LOQ - Limit of quantitation

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.

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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 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	EPA 23
Dibenzofurans	
Determination of Polychlorinated p-Dioxins & Polychlorinated	EPA TO-9A
Dibenzofurans	

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

Revised coc-recid via client email 11/26/18 (Ja

Address

Time

17:00

Time

Add Analysis(es) Requested

BS

Container(s)

2 Р ww

2 Р ww

2

525 W. Allegan Street

Sampler: Garth Cousineau



Stephanie Kammer

Relinquished by (printed name and signature)

Relinquished by (printed name and signature)

SHIP TO: Vista Analytical Laboratory 1104 Windfield Way

ATTN: Jennifer Miller

Sample ID

Special Instructions/Comments:

WW1810310815GC

WW1810310800GC

BS1810310830GC

El Dorado Hills, CA 95762

Ph: (916) 673-1520; Fax: (916) 673-0106

Date

10/31/18

10/31/18

10/31/18

Time

0815

0800

Invoice to: Name

Dorin Bogdan

Project ID: Statewide WWTP Biosolids PFAS Evaluation

CHAIN OF CUSTODY

PO#: **60588767.01**

Date

11/20/2018

Date

Method of Shipment:

Tracking No.:

ocation/Sample Description

IONA-MI0021041-EFPT1

IONA-MI0021041-IFPT1

IONA-MI0021041-STAND

Send Results and Acknowledgements to the list provided

Company **MDEQ**

Down Bogdan

pler: Garth Cousineau (name)	Work Orde Storage ID	TAT	Standard: Rush (surchar) 14 days	x 21 days rge may apply) 7 days Spe	Yes No Decify:
Street	City Lansing		State MI	Ph# 517-897-159 7	Fax# 517-241-3571
Received by (printed name and signatu				Date	Time
Received by (printed name and signatu	ıre)		_	Date	Time
sted	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		\$/	Comments	
x		Effluet			
x		Influent			
x		Stabiliez	ed Anaerobic		
SEND DOCUMENTATION AND RESULTS TO:	Company: Address: City:		nn Street, Con	stitution Hall, 1s	30242

DOCUMENTA AND RESULT Email: dorin.bogdan@aecom.com Container Types: P= HDPE, PJ= HDPE Jar Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, Bottle Preservation Type: T = Thiosulfate, O = Other: TZ = Trizma: SL = Sludge, BS=Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:



Stephanie Kammer

Relinquished by (printed name and signature)

Relinquished by (printed name and signature)

SHIP TO: Vista Analytical Laboratory 1104 Windfield Way

ATTN: Jennifer Miller

Sample ID

Special Instructions/Comments:

Container Types: P= HDPE, PJ= HDPE Jar

WW1810310815GC

WW1810310800GC

BS1810310830GC

El Dorado Hills, CA 95762

Ph: (916) 673-1520; Fax: (916) 673-0106

Invoice to: Name

Dorin Bogdan

Project ID: Statewide WWTP Biosolids PFAS Evaluation

CHAIN OF CUS

Bottle Preservation Type: T = Thiosulfate,

CHAIN OF CUSTODY							Work Order #: 1003503 Temp: 0.5 Storage ID: Storage Secured: Yes						
ds PFAS E	valuatio	on PO#:60588767.0)1		s	ampler:	Gart	h Cousi				TAT Standard: x 21 days (check one): Rush (surcharge may apply)	
	Compar	nv.		٨٨٨	ress				(name)	0.11		14 days 7 days Specify:	
	MDEQ	iy			W. Alleg	ian Stre	of			City Lans		State Ph# Fax# g MI 517-897-1597 517-241-3571	
nature)		Date	-	Time	A The same			by (prin	tod name and sig		sing		
m	h	11/6/2018		17:0		B.	BU	NIG	ted name and sig	PALL	B	medies 1/109/18 094/	
nature)		Date		Time	9	Rec	eived	by (prin	ted name and sig	nature)		Date Time	
916) 673-0 ⁻	106	Method of Shipment: Tracking No.:		Cont	sis(es) Re	7	The state of the s	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	State of the state		1000	Comments	
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10/31/18	0815	IONA-MI0021041-EFPLT	2	P	ww		Х					Effluet	
10/31/18	0805	IONA-MI0021041-IFPLT	2	Р	ww		X					Influent ; 0800	
10/31/18	0830	IONA-MI0021041-STAND	2	Р	BS		х					Stabiliezed Anaerobic	
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			1										
Send Resu	ults and	Acknowledgements to the	list pr	ovide	d			DOCU	SEND MENTATION	Compa	any:	e: Stephanie Kammer // MDEQ	
						- - - -		AND R	ESULTS TO:	Pho	City: one:	5: 525 W. Allegan Street, Constitution Hall, 1st South West 7: Lansing State: MI Zip: 30242 2: 517-897-1597 Fax: 517-241-3571 3: dorin.bogdan@aecom.com	

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,

O = Other: TZ = Trizma: SL = Sludge, BS=Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:



Sample Log-In Checklist

Vista Work Orde	er#:	1	803	358	33			Page#	1 370		-	
Samples Arrival:	Arrival: 11/89/18 Date/Time		0941 BB			Location: WR-7 Shelf/Rack: NA						
Logged In:			1519		Initials:		Location: WR-7 Shelf/Rack: 43/F3					
Delivered By:	FedEx	UPS	On Tra	ac GSO E		DHL	L Hand Delivered			Other		
Preservation:	. (Ice	Blue					D	ry Ice		None		
Temp °C: ().	(uncorre	P	robe us	ed: Y	/(N)	The	ermome	eter ID:	IR	-4	
					. grazes er entrose e . En		N. T		YES	NO	NA	
Adequate Samp	The Market	eceived'	?						1	-		
Holding Time Ac		1/0			-				1/	-		
Shipping Contain									-		1	
Shipping Custod							-		1			
Shipping Docum			17	ME	28	101	-/		1	-		
Airbill	Trk #		77	19	70	12	2		V	-		
Sample Containe		+2					_				1	
Sample Custody			totion D	rocont	2				1			
COC Anomaly/S							_			V		
											1	
If Chlorinated or Drinking Water Samples, Acceptable Preservation?								2				
Preservation Documented: Na ₂ S ₂ O ₃ Trizma None Other						Yes	No(NÁ				
Shipping Contain	ner	V	/ista	C	lient) Re	etair	R	eturn	Disp	ose	

Comments:

ID.: LR - SLC

Rev No.: 3

Rev Date: 05 October 2018

Page: 1 of 1



July 31, 2019

Vista Work Order No. 1902059

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 July 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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Work Order 1902059 Page 1 of 22

Vista Work Order No. 1902059 Case Narrative

Sample Condition on Receipt:

Seven drinking water samples and one aqueous 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 sample ID discrepancy was noted: the sample listed as "WR1907101005ST" on the sample container label has been reported as "WT1907101005ST", as it was listed on the CoC.

Analytical Notes:

EPA Method 537, Rev. 1.1

The samples were extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

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.

Two Laboratory Fortified Blanks (LFB/LFBD) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB/LFBD recoveries were within the method acceptance criteria.

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

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1902059-01	WT1907100910ST	10-Jul-19 09:10	11-Jul-19 09:00	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1902059-02	WR1907100930ST	10-Jul-19 09:30	11-Jul-19 09:00	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1902059-03	WT1907100950ST	10-Jul-19 09:50	11-Jul-19 09:00	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1902059-04	FB1907100955ST	10-Jul-19 09:55	11-Jul-19 09:00	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1902059-05	WT1907101005ST	10-Jul-19 10:05	11-Jul-19 09:00	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1902059-06	WT1907101015ST	10-Jul-19 10:15	11-Jul-19 09:00	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1902059-07	WT1907101035ST	10-Jul-19 10:35	11-Jul-19 09:00	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1902059-08	WT1907101045ST	10-Jul-19 10:45	11-Jul-19 09:00	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1902059-03 1902059-04 1902059-05 1902059-06 1902059-07	WT1907100950ST FB1907100955ST WT1907101005ST WT1907101015ST WT1907101035ST	10-Jul-19 09:50 10-Jul-19 09:55 10-Jul-19 10:05 10-Jul-19 10:15 10-Jul-19 10:35	11-Jul-19 09:00 11-Jul-19 09:00 11-Jul-19 09:00 11-Jul-19 09:00 11-Jul-19 09:00	HDPE Bottle, 250 mL

Vista Project: 1902059 Client Project: Statewide WWTP Biosolids PFAS Evaluation

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ANALYTICAL RESULTS

Work Order 1902059 Page 5 of 22



Sample ID: LRB								10d 537		
Client Data				Lab	oratory Data					
Name:	Merit Laboratories, Inc.	Matrix:	Aqueous	Lab	Sample:	B9G0132-	BLK1	Column:	BEH C18	
Project:	Statewide WWTP Biosolids PFAS Evalua		•		•			Corumni	BEIT CTO	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
PFHxA	307-24-4	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
PFHpA	375-85-9	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
PFHxS	355-46-4	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
PFOA	335-67-1	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
PFNA	375-95-1	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
PFOS	1763-23-1	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
PFDA	335-76-2	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
MeFOSAA	2355-31-9	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
EtFOSAA	2991-50-6	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
PFUnA	2058-94-8	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
PFDoA	307-55-1	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
PFTrDA	72629-94-8	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
PFTeDA	376-06-7	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
Labeled Standard	ls Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	90	70 - 130			B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
13C2-PFDA	SURR	92	70 - 130			B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1
d5-EtFOSAA	SURR	85	70 - 130			B9G0132	15-Jul-19	0.25 L	18-Jul-19 04:06	1

RL - Reporting limit

Results reported to RL.
Reporting convention specified by MI DEQ.

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

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PFAS Evalua LFB (ng/L)		QC Bat	•	B9G013	22 DC1/D0	~								
		Samp S	Lab Sample: B9G0132-BS1/B9G0132-BSD1 QC Batch: B9G0132 Samp Size: 0.25/0.25 L		Date Extracted: Column:					15-Jul-19 BEH C18				
(Hg/L)	LFB Spike	LFB % Rec	LFB Quals	LFBD (ng/L)	LFBD Spike	LFBD % Rec	RPD	LFBD Quals	%Rec Limits		LFB Analyzed	LFB Dil	LFBD Analyzed	LFBD Dil
65	71	92		74	71	104	12		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
74	80	93		84	80	105	12		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
77	80	97		88	80	110	13		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
69	73	94		78	73	107	13		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
80	80	100		85	80	107	6		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
75	80	94		84	80	106	12		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
74	74	100		81	74	109	8		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
70	80	88		85	80	106	18		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
80	80	100		87	80	109	9		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
68	80	85		81	80	102	19		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
78	80	98		83	80	104	6		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
77	80	96		87	80	108	12		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
82	80	102		91	80	114	11		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
76	80	95		87	80	109	14		70-130	30	18-Jul-19 04:17	1	18-Jul-19 04:28	1
Т		LFB % Rec	LFB			LFBD		LFBD	Limits		LFB Analyzed	LFB		LFBD Dil
• •			Quais					Quais			·	1		
SURR		93												
SURR		96				111			70-130 70-130		18-Jul-19 04:17	1	18-Jul-19 04:28	-
	74 70 80 68 78 77 82	74 74 70 80 80 80 80 80 68 80 78 80 77 80 82 80 76 80	74 74 100 70 80 88 80 80 100 68 80 85 78 80 98 77 80 96 82 80 102 76 80 95 LFB Type % Rec	74 74 100 70 80 88 80 80 100 68 80 85 78 80 98 77 80 96 82 80 102 76 80 95 LFB LFB LFB Quals	74 74 100 81 70 80 88 85 80 80 100 87 68 80 85 81 78 80 98 83 77 80 96 87 82 80 102 91 76 80 95 87 LFB LFB Type % Rec Quals	74 74 100 81 74 70 80 88 85 80 80 80 100 87 80 68 80 85 81 80 78 80 98 83 80 77 80 96 87 80 82 80 102 91 80 76 80 95 87 80 LFB LFB Type % Rec Quals	74 74 100 81 74 109 70 80 88 85 80 106 80 80 100 87 80 109 68 80 85 81 80 102 78 80 98 83 80 104 77 80 96 87 80 108 82 80 102 91 80 114 76 80 95 87 80 109 LFB LFB LFB LFB CFB LFBD MR % Rec % Rec Quals % Rec	74 74 100 81 74 109 8 70 80 88 85 80 106 18 80 80 100 87 80 109 9 68 80 85 81 80 102 19 78 80 98 83 80 104 6 77 80 96 87 80 108 12 82 80 102 91 80 114 11 76 80 95 87 80 109 14 LFB LFB LFB LFB CFB LFBD MRC % Rec % Rec % Rec % Rec	74 74 100 81 74 109 8 70 80 88 85 80 106 18 80 80 100 87 80 109 9 68 80 85 81 80 102 19 78 80 98 83 80 104 6 77 80 96 87 80 108 12 82 80 102 91 80 114 11 76 80 95 87 80 109 14 LFB LFB LFB % Rec LFBD % Rec Quals	74 74 100 81 74 109 8 70-130 70 80 88 85 80 106 18 70-130 80 80 100 87 80 109 9 70-130 68 80 85 81 80 102 19 70-130 78 80 98 83 80 104 6 70-130 77 80 96 87 80 108 12 70-130 82 80 102 91 80 114 11 70-130 76 80 95 87 80 109 14 70-130 Type LFB LFB LFBD LFBD LImits	74 74 100 81 74 109 8 70-130 30 70 80 88 85 80 106 18 70-130 30 80 80 100 87 80 109 9 70-130 30 68 80 85 81 80 102 19 70-130 30 78 80 98 83 80 104 6 70-130 30 77 80 96 87 80 108 12 70-130 30 82 80 102 91 80 114 11 70-130 30 76 80 95 87 80 109 14 70-130 30 LFB LFBD LFBD Limits	74 74 100 81 74 109 8 70-130 30 18-Jul-19 04:17 70 80 88 85 80 106 18 70-130 30 18-Jul-19 04:17 80 80 100 87 80 109 9 70-130 30 18-Jul-19 04:17 68 80 85 81 80 102 19 70-130 30 18-Jul-19 04:17 78 80 98 83 80 104 6 70-130 30 18-Jul-19 04:17 77 80 96 87 80 108 12 70-130 30 18-Jul-19 04:17 82 80 102 91 80 114 11 70-130 30 18-Jul-19 04:17 76 80 95 87 80 109 14 70-130 30 18-Jul-19 04:17 LFB LFB LFBD LFBD LFBD Analyze	74 74 100 81 74 109 8 70-130 30 18-Jul-19 04:17 1 70 80 88 85 80 106 18 70-130 30 18-Jul-19 04:17 1 80 80 100 87 80 109 9 70-130 30 18-Jul-19 04:17 1 68 80 85 81 80 102 19 70-130 30 18-Jul-19 04:17 1 78 80 98 83 80 104 6 70-130 30 18-Jul-19 04:17 1 77 80 96 87 80 108 12 70-130 30 18-Jul-19 04:17 1 82 80 102 91 80 114 11 70-130 30 18-Jul-19 04:17 1 76 80 95 87 80 109 14 70-130 30 18-Jul-19 04:17 1 </td <td>74 74 100 81 74 109 8 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28 70 80 88 85 80 106 18 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28 80 80 100 87 80 109 9 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28 68 80 85 81 80 102 19 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28 78 80 98 83 80 104 6 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28 77 80 96 87 80 108 12 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28 82 80 102 91 80 114 11 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28</td>	74 74 100 81 74 109 8 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28 70 80 88 85 80 106 18 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28 80 80 100 87 80 109 9 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28 68 80 85 81 80 102 19 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28 78 80 98 83 80 104 6 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28 77 80 96 87 80 108 12 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28 82 80 102 91 80 114 11 70-130 30 18-Jul-19 04:17 1 18-Jul-19 04:28

Reporting convention specified by MI DEQ.

Work Order 1902059 Page 7 of 22



Sample ID: W	Sample ID: WT1907100910ST EPA Method 537										
Client Data				La	boratory Data						
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lat	Sample:	1902059-0	1	Column:	BEH C18		
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	10-Jul-19 09:10	Da	te Received:	11-Jul-19	09:00		BBITCIO		
Location:	11937 CEDAR LAKE										
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
PFHxA	307-24-4	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
PFHpA	375-85-9	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
PFHxS	355-46-4	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
PFOA	335-67-1	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
PFNA	375-95-1	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
PFOS	1763-23-1	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
PFDA	335-76-2	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
MeFOSAA	2355-31-9	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
EtFOSAA	2991-50-6	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
PFUnA	2058-94-8	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
PFDoA	307-55-1	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
PFTrDA	72629-94-8	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
PFTeDA	376-06-7	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
Labeled Standard	ls Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	96	70 - 130			B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
13C2-PFDA	SURR	96	70 - 130			B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	
d5-EtFOSAA	SURR	85	70 - 130			B9G0132	15-Jul-19	0.24 L	18-Jul-19 06:39	1	

Results reported to RL.

Reporting convention specified by MI DEQ..

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

Work Order 1902059 Page 8 of 22



Sample ID: W	Sample ID: WR1907100930ST EPA Method 537										
Client Data				La	boratory Data						
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lat	Sample:	1902059-0)2	Column:	BEH C18		
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	10-Jul-19 09:30	Da	te Received:	11-Jul-19	09:00		BBITCIO		
Location:	11965 CEDAR LAKE										
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	140		2		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
PFHxA	307-24-4	75		2		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
PFHpA	375-85-9	53		2		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
PFHxS	355-46-4	5		2		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
PFOA	335-67-1	33		2		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
PFNA	375-95-1	ND		2		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
PFOS	1763-23-1	2		2		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
PFDA	335-76-2	ND		2		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
MeFOSAA	2355-31-9	ND		4		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
EtFOSAA	2991-50-6	ND		4		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
PFUnA	2058-94-8	ND		4		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
PFDoA	307-55-1	ND		4		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
PFTrDA	72629-94-8	ND		4		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
PFTeDA	376-06-7	ND		4		B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
Labeled Standard	ls Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	98	70 - 130			B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
13C2-PFDA	SURR	95	70 - 130			B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	
d5-EtFOSAA	SURR	91	70 - 130			B9G0132	15-Jul-19	0.23 L	18-Jul-19 06:50	1	

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: W	Sample ID: WT1907100950ST EPA Method 537										
Client Data				Lal	boratory Data						
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lat	Sample:	1902059-0	13	Column:	BEH C18		
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	10-Jul-19 09:50		te Received:	11-Jul-19	09:00		BEIT 010		
Location:	11977 CEDAR LAKE										
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	ND		2		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
PFHxA	307-24-4	ND		2		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
PFHpA	375-85-9	ND		2		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
PFHxS	355-46-4	ND		2		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
PFOA	335-67-1	ND		2		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
PFNA	375-95-1	ND		2		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
PFOS	1763-23-1	ND		2		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
PFDA	335-76-2	ND		2		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
MeFOSAA	2355-31-9	ND		4		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
EtFOSAA	2991-50-6	ND		4		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
PFUnA	2058-94-8	ND		4		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
PFDoA	307-55-1	ND		4		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
PFTrDA	72629-94-8	ND		4		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
PFTeDA	376-06-7	ND		4		B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
Labeled Standard	ls Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	115	70 - 130			B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
13C2-PFDA	SURR	95	70 - 130			B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	
d5-EtFOSAA	SURR	75	70 - 130			B9G0132	15-Jul-19	0.23 L	22-Jul-19 16:54	1	

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: FB1907100955ST EPA Method 537										
Client Data				Lab	oratory Data					
Name:	Merit Laboratories, Inc.	Matrix:	Aqueous	Lab	Sample:	1902059-0	14	Column:	BEH C18	
Project:	Statewide WWTP Biosolids PFAS Evaluation	n Date Collected:	10-Jul-19 09:55		e Received:	11-Jul-19	09:00	2 2 3 3 3 3 3 3 3 3	BEITCIO	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
PFHxA	307-24-4	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
PFHpA	375-85-9	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
PFHxS	355-46-4	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
PFOA	335-67-1	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
PFNA	375-95-1	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
PFOS	1763-23-1	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
PFDA	335-76-2	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
MeFOSAA	2355-31-9	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
EtFOSAA	2991-50-6	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
PFUnA	2058-94-8	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
PFDoA	307-55-1	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
PFTrDA	72629-94-8	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
PFTeDA	376-06-7	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
Labeled Standar	ds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	99	70 - 130			B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
13C2-PFDA	SURR	101	70 - 130			B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1
d5-EtFOSAA	SURR	90	70 - 130			B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:11	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: W	Г1907101005ST								EPA Meth	nod 537
Client Data				La	boratory Data					
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lat	Sample:	1902059-0)5	Column:	BEH C18	
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	10-Jul-19 10:05	Da	te Received:	11-Jul-19	09:00			
Location:	8722 JUDEVINE RD									
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
PFHxA	307-24-4	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
PFHpA	375-85-9	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
PFHxS	355-46-4	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
PFOA	335-67-1	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
PFNA	375-95-1	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
PFOS	1763-23-1	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
PFDA	335-76-2	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
MeFOSAA	2355-31-9	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
EtFOSAA	2991-50-6	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
PFUnA	2058-94-8	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
PFDoA	307-55-1	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
PFTrDA	72629-94-8	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
PFTeDA	376-06-7	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
Labeled Standard	ls Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	91	70 - 130			B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
13C2-PFDA	SURR	95	70 - 130			B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1
d5-EtFOSAA	SURR	89	70 - 130			B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:22	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: W	VT1907101015ST								EPA Meth	nod 537
Client Data				Lab	oratory Data					
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lab	Sample:	1902059-0	06	Column:	BEH C18	
Project:	Statewide WWTP Biosolids PFAS Evaluatio	n Date Collected:	10-Jul-19 10:15		e Received:	11-Jul-19	09:00		BBITCIO	
Location:	8674 JUDEVINE RD									
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
PFHxA	307-24-4	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
PFHpA	375-85-9	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
PFHxS	355-46-4	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
PFOA	335-67-1	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
PFNA	375-95-1	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
PFOS	1763-23-1	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
PFDA	335-76-2	ND		2		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
MeFOSAA	2355-31-9	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
EtFOSAA	2991-50-6	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
PFUnA	2058-94-8	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
PFDoA	307-55-1	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
PFTrDA	72629-94-8	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
PFTeDA	376-06-7	ND		4		B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	92	70 - 130			B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
13C2-PFDA	SURR	94	70 - 130			B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1
d5-EtFOSAA	SURR	88	70 - 130			B9G0132	15-Jul-19	0.24 L	18-Jul-19 07:33	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: W	Г1907101035ST								EPA Meth	hod 537
Client Data				La	boratory Data					
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lat	b Sample:	1902059-0	7	Column:	BEH C18	
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	10-Jul-19 10:35	Da	te Received:	11-Jul-19	09:00		BBITCIO	
Location:	8478 FRONT ST									
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	3		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
PFHxA	307-24-4	5		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
PFHpA	375-85-9	3		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
PFHxS	355-46-4	3		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
PFOA	335-67-1	9		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
PFNA	375-95-1	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
PFOS	1763-23-1	13		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
PFDA	335-76-2	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
MeFOSAA	2355-31-9	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
EtFOSAA	2991-50-6	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
PFUnA	2058-94-8	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
PFDoA	307-55-1	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
PFTrDA	72629-94-8	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
PFTeDA	376-06-7	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
Labeled Standard	ls Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	94	70 - 130			B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
13C2-PFDA	SURR	93	70 - 130			B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1
d5-EtFOSAA	SURR	90	70 - 130			B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:44	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: W	Sample ID: WT1907101045ST EPA Method 537									
Client Data				Lab	oratory Data					
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lab	Sample:	1902059-0	08	Column:	BEH C18	
Project:	Statewide WWTP Biosolids PFAS Evaluation	Date Collected:	10-Jul-19 10:45	Dat	e Received:	11-Jul-19	09:00			
Location:	8450 FRONT ST									
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	3		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
PFHxA	307-24-4	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
PFHpA	375-85-9	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
PFHxS	355-46-4	4		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
PFOA	335-67-1	4		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
PFNA	375-95-1	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
PFOS	1763-23-1	4		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
PFDA	335-76-2	ND		2		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
MeFOSAA	2355-31-9	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
EtFOSAA	2991-50-6	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
PFUnA	2058-94-8	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
PFDoA	307-55-1	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
PFTrDA	72629-94-8	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
PFTeDA	376-06-7	ND		4		B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	93	70 - 130			B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
13C2-PFDA	SURR	96	70 - 130			B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1
d5-EtFOSAA	SURR	92	70 - 130			B9G0132	15-Jul-19	0.25 L	18-Jul-19 07:55	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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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.

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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	E87777-21
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-В
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
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.

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NELAP Accredited Test Methods

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

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

Page 1 of 2

MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B
Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue	EPA 1668A/C
by GC/HRMS	
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	EPA 8280A/B
Dibenzofurans by GC/HRMS	
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	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	EPA 8280A/B
Dibenzofurans by GC/HRMS	
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

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Container Types: P= HDPE, PJ= HDPE Jar

O = Other:

18	Vista Analytical Laborate	ory		CHAIN OF	C	US	STC	D	Y					Work Or	der#:	_	1059 WE-Z		- 120	<u> </u>
Project ID:	Statewide WWTP Bio	osolids PFAS E	valuatio	n PO#: <u>60588767.01</u>)			San	mpler: <u>S</u>	Sara	Thurl		le (name)		TA (che	tT eck one):	Standard: Rush (sur	charge m] 21 days nay apply)] 7 days Sp	pecify:
Invoice to:	Name Stephanie Kammer		Compar	У		Addi		egar	n Stree	t				City Lansin	n		State	Ph#	‡ '-897-1597	Fax# 517-241-3571
Kaitlyn Eic	ed by (printed name and	d signature)		Date 7/10/2019 Date	-	Time	e 0		Recei	ived	1	u	d name and signa Mosc d name and signa	ture)	Q Q	p	0	7/1	Date Date	Time O9 OC
	Vista Analytical Labor 1104 Windfield Way El Dorado Hills, CA 9 Ph: (916) 673-1520; F	5762	106	Method of Shipment: Tracking No.:		Cont	ainer(s)	/	W. Some	7	W. Isomo	P. AS. 160.08 B.		Como prass	\$ 45 mg	\$			
Sa	mple ID	Date	Time	Location/Sample Description	O O	The state of the s	Water Land	/	15/0/21 [6/0/2]	1/0/0/2	\$ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Liston	8 / 2 MO OF THE STATE OF THE ST	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	200				Comments	
WT19071009	910ST	7/10/19	0910	11937 CEDAR LAKE	2	P	DW	Ť		Ĭ	1	Ť			X	TZ; KITC	HEN SINK	; NO TR	EATMENT	
WR1907100	930ST	7/10/19	0930	11965 CEDAR LAKE	2	Р	DW		2.1			\neg			х	TZ; OUT	SIDE SPIG	от; вуг	ASSED SO	FTENER
WT19071009	950ST	7/10/19	0950	11977 CEDAR LAKE	2	Р	DW								х	TZ; OUT	SIDE SPIG	OT; TRE	ATMENT U	NKOWN
FB19071009	55ST	7/10/19	0955		2	Р	AQ				П	\neg			х	TZ; FIEL	D BLANK			
WT19071010	005ST	7/10/19	1005	8722 JUDEVINE RD	2	Р	DW								х	TZ; OUT	SIDE SPIG	OT; TRE	ATMENT U	NKOWN
WT19071010	015ST	7/10/19	1015	8674 JUDEVINE RD	2	Р	DW						Leon		x	TZ; OUT	SIDE SPIG	OT; TRE	ATMENT U	NKNOWN
WT19071010	035ST	7/10/19	1035	8478 FRONT ST	2	Р	DW								х	TZ; KITC	HEN SINK	; NO TR	EATMENT	
WT19071010	045ST	7/10/19	1045	8450 FRONT ST	2	Р	DW								x	TZ; KITC	HEN SINK	; NO TR	EATMENT	
							H		\vdash	+		\dashv			-					
Special Instri	uctions/Comments:	Send Res	ults and	Acknowledgements to the	list pro	ovide	ed					CUN	SEND MENTATION SSULTS TO:	Compan Addres Cit Phon	y: MD s: 525 y: Lar e: 517	W. Allega sing -897-1597	ın Street, (State Fax		st South West ip: 30242 571

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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:



Sample Log-In Checklist

Vista Work Orde	r#:	10,50	59			TA1	Stol	Ţ	_	
Samples	Date/Tim	2.5	0900	Initials:		Locati	on: WP	-7		
Arrival:	07/11	1/19	0110	agn)	Shelf/F	Rack: N	/A		
Logged In:	Date/Tim		137	Initials:		Locati		/WR-Z		
Delivered By: (FedEx	UPS	On Tra	ac GSO	DHL		Hand elivered		her	
Preservation:	lo	e)	Blu	ue Ice		Dry Io	е	No	ne	
Temp °C: ().9	(uncor	rected)	robe us	ed: Y / N		The	ometer ID	TD-	3	
Temp °C: 0 Q	(correc	ted)	Tobe us	eu. T / N)	Therm	ometer ID	+-	<u> </u>	
							YES	NO	NA	
Adequate Sample	e Volume	Received'	?			2 3-11-11-11-11-11-11-11-11-11-11-11-11-11				
Holding Time Acc	ceptable?						V	1		
Shipping Contain	er(s) Intac	t?								
Shipping Custody	y Seals Int	act?					-			
Shipping Docume	entation Pr	esent?								
Airbill —	Trk	# 489	4 66	96 6	394	7				
Sample Containe	er Intact?									
Sample Custody	Seals Inta	ct?								
Chain of Custody	/ Sample	Documen	tation Pr	esent?			-	-		
COC Anomaly/Sa	ample Acc	eptance F	orm com	pleted?			V			
If Chlorinated or [Orinking W	ater Sam	ples, Acc	eptable Pre	eserva	tion?				
Preservation Doc	umented:	Na: Other	₂ S ₂ O ₃ (Trizma	Non	е	Yes	No	NA	
Shipping Contain	er	V	/ista	Client	Re	etain)	Return	Disp	ose	
Comments: COC Sample ID "WT 19071010		Bott.	label L1907	ID:	ST"	Cagu o	7/11/19			

ID.: LR - SLC

Rev No.: 3

Rev Date: 05 October 2018

Page: 1 of 1

Sample #5

Chain of Custody Anomaly/Sample Acceptance Form



Client:

Merit Laboratories, Inc.

Contact:

Maya Murshak

Email: Phone: mayamurshak@meritlabs.com (517) 827-2744

Workorder Number:

Date Received:

1902059 11-Jul-19 09:00

Documented by/date: Ashley Mason 07-11-19

Please review the following information and complete the Client Authorization section. authorization before proceeding with sample analysis.	To comply with NELAC regulations, we must receive
Sample Collection Date and/or Time not provided	
Temperature outside Method Requirement (WI-PHT) Temperature°C	Melted
X 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	
Other:	
Comments/Samples Affected: Sample Label ID COC ID WR1907101005ST WR1907101005ST WR1907101005ST	

Client Authorization Signature and Date Proceed with Analysis: Client Comments/Instructions <u>Client</u> notified

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October 22, 2019

Vista Work Order No. 1903280

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 September 25, 2019 under your Project Name 'Statewide Biosolids'.

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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph; 916-673-1520 fx; 916-673-0106 www.vista-analytical.com

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Vista Work Order No. 1903280 Case Narrative

Sample Condition on Receipt:

Twelve drinking water 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:

EPA Method 537, Rev. 1.1

The samples were extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

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.

Two Laboratory Fortified Blanks (LFB/LFBD) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB/LFBD recoveries were within the method acceptance criteria.

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

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1903280-01	WR1909240900KER	24-Sep-19 09:00	25-Sep-19 10:14	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1903280-02	WR1909240920KER	24-Sep-19 09:20	25-Sep-19 10:14	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1903280-03	WR1909240930KER	24-Sep-19 09:30	25-Sep-19 10:14	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1903280-04	WT1909240950KER	24-Sep-19 09:50	25-Sep-19 10:14	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1903280-05	WT1909241000KER	24-Sep-19 10:00	25-Sep-19 10:14	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1903280-06	WT1909241020KER	24-Sep-19 10:20	25-Sep-19 10:14	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1903280-07	WT1909241030KER	24-Sep-19 10:30	25-Sep-19 10:14	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1903280-08	WR1909241040KER	24-Sep-19 10:40	25-Sep-19 10:14	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1903280-09	WT1909241050KER	24-Sep-19 10:50	25-Sep-19 10:14	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1903280-10	WT1909241110KER	24-Sep-19 11:10	25-Sep-19 10:14	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1903280-11	WT1909241120KER	24-Sep-19 11:20	25-Sep-19 10:14	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1903280-12	WT1909241145KER	24-Sep-19 11:45	25-Sep-19 10:14	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 1903280 Client Project: Statewide Biosolids

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ANALYTICAL RESULTS

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Sample ID: L	RB								EPA Meth	nod 537
Client Data				Lab	oratory Data					
Name: Project:	Merit Laboratories, Inc. Statewide Biosolids	Matrix:	Aqueous	Lab	Sample:	В9І0265-І	BLK1	Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
PFHxA	307-24-4	ND		2		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
PFHpA	375-85-9	ND		2		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
PFHxS	355-46-4	ND		2		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
PFOA	335-67-1	ND		2		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
PFNA	375-95-1	ND		2		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
PFOS	1763-23-1	ND		2		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
PFDA	335-76-2	ND		2		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
MeFOSAA	2355-31-9	ND		4		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
EtFOSAA	2991-50-6	ND		4		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
PFUnA	2058-94-8	ND		4		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
PFDoA	307-55-1	ND		4		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
PFTrDA	72629-94-8	ND		4		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
PFTeDA	376-06-7	ND		4		B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	95	70 - 130			B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
13C2-PFDA	SURR	91	70 - 130			B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1
d5-EtFOSAA	SURR	90	70 - 130			B9I0265	08-Oct-19	0.25 L	09-Oct-19 23:09	1

Results reported to RL.
Reporting convention specified by MI DEQ.

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

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Sample ID:	LFBD														EPA Metho	d 537
Name: Project: Matrix:	Merit Laboratories, Inc. Statewide Biosolids Aqueous			Lab Sar QC Bat Samp S	ch:	B9I0265-BS1/B9I0265-BSD1 B9I0265 0.25/0.25 L						Date Extracted: Column:		08-Oct-19 BEH C18		
Analyte	CAS Number	LFB (ng/L)	LFB Spike	LFB % Rec	LFB Quals	LFBD (ng/L)	LFBD Spike	LFBD % Rec	RPD	LFBD Quals	%Rec Limits		LFB Analyzed	LFB Dil	LFBD Analyzed	LFBD Dil
PFBS	375-73-5	69	71	98		62	71	88	11		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
PFHxA	307-24-4	71	80	89		68	80	85	4		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
PFHpA	375-85-9	69	80	87		67	80	84	3		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
PFHxS	355-46-4	75	73	103		65	73	90	13		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
PFOA	335-67-1	73	80	91		71	80	88	3		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
PFNA	375-95-1	72	80	91		70	80	88	3		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
PFOS	1763-23-1	74	74	100		67	74	90	10		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
PFDA	335-76-2	72	80	90		62	80	77	15		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
MeFOSAA	2355-31-9	79	80	98		75	80	93	5		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
EtFOSAA	2991-50-6	81	80	101		73	80	92	10		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
PFUnA	2058-94-8	72	80	90		66	80	83	8		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
PFDoA	307-55-1	65	80	81		63	80	79	3		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
PFTrDA	72629-94-8	63	80	79		58	80	73	8		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
PFTeDA	376-06-7	66	80	82		59	80	74	11		70-130	30	09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
Labeled Stand	dards	Туре		LFB % Rec	LFB Quals			LFBD % Rec		LFBD Quals	Limits		LFB Analyzed	LFB Dil	LFBD Analyzed	LFBD Dil
13C2-PFHxA		SURR		91				87			70-130		09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
13C2-PFDA		SURR		95				80			70-130		09-Oct-19 23:20	1	09-Oct-19 23:31	1 1
d5-EtFOSAA		SURR		91				83			70-130		09-Oct-19 23:20	1	09-Oct-19 23:31	1 1

Reporting convention specified by MI DEQ.

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Sample ID: V	VR1909240900KER									EPA Metl	nod 537
Client Data					Lab	oratory Data					
Name:	Merit Laboratories, Inc).	Matrix:	Drinking Water	Lab	Sample:	1903280-0)1	Column:	BEH C18	
Project:	Statewide Biosolids		Date Collected:	24-Sep-19 09:00	Dat	e Received:	25-Sep-19	10:14		BEITETE	
Location:	4291 SE County Line			•			•				
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
PFHxA		307-24-4	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
PFHpA		375-85-9	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
PFHxS		355-46-4	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
PFOA		335-67-1	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
PFNA		375-95-1	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
PFOS		1763-23-1	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
PFDA		335-76-2	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
MeFOSAA		2355-31-9	ND		4		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
EtFOSAA		2991-50-6	ND		4		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
PFUnA		2058-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
PFDoA		307-55-1	ND		4		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
PFTrDA		72629-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
PFTeDA		376-06-7	ND		4		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
Labeled Standa	rds	Туре	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	110	70 - 130			B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
13C2-PFDA		SURR	104	70 - 130			B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1
d5-EtFOSAA		SURR	102	70 - 130			B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:41	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: V	WR1909240920KER									EPA Meth	od 537
Client Data					Lab	boratory Data					
Name:	Merit Laboratories, Inc		Matrix:	Drinking Water	Lab	Sample:	1903280-0)2	Column:	BEH C18	
Project:	Statewide Biosolids		Date Collected:	24-Sep-19 09:20	Dat	te Received:	25-Sep-19	10:14			
Location:	4091 SE County Line										
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
PFHxA		307-24-4	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
PFHpA		375-85-9	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
PFHxS		355-46-4	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
PFOA		335-67-1	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
PFNA		375-95-1	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
PFOS		1763-23-1	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
PFDA		335-76-2	ND		2		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
MeFOSAA		2355-31-9	ND		4		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
EtFOSAA		2991-50-6	ND		4		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
PFUnA		2058-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
PFDoA		307-55-1	ND		4		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
PFTrDA		72629-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
PFTeDA		376-06-7	ND		4		B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
Labeled Standa	rds	Туре	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	98	70 - 130			B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
13C2-PFDA		SURR	93	70 - 130			B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1
d5-EtFOSAA		SURR	89	70 - 130			B9I0265	08-Oct-19	0.24 L	09-Oct-19 23:52	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: V	WR1909240930KER									EPA Meth	10d 537
Client Data					Lat	boratory Data					
Name:	Merit Laboratories, Inc	·.	Matrix:	Drinking Water	Lab	Sample:	1903280-0)3	Column:	BEH C18	
Project:	Statewide Biosolids		Date Collected:	24-Sep-19 09:30	Dat	te Received:	25-Sep-19	10:14			
Location:	4169 SE County Line										
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
PFHxA		307-24-4	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
PFHpA		375-85-9	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
PFHxS		355-46-4	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
PFOA		335-67-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
PFNA		375-95-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
PFOS		1763-23-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
PFDA		335-76-2	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
MeFOSAA		2355-31-9	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
EtFOSAA		2991-50-6	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
PFUnA		2058-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
PFDoA		307-55-1	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
PFTrDA		72629-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
PFTeDA		376-06-7	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
Labeled Standa	rds	Туре	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	94	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
13C2-PFDA		SURR	88	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1
d5-EtFOSAA		SURR	80	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:03	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: V	WT1909240950KER								EPA Meth	10d 537	
Client Data					Lab	oratory Data					
Name:	Merit Laboratories, Inc		Matrix:	Drinking Water	Lab	Sample:	1903280-0)4	Column:	BEH C18	
Project:	Statewide Biosolids		Date Collected:	24-Sep-19 09:50	Dat	e Received:	25-Sep-19	10:14			
Location:	4233 SE County Line										
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
PFHxA		307-24-4	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
PFHpA		375-85-9	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
PFHxS		355-46-4	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
PFOA		335-67-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
PFNA		375-95-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
PFOS		1763-23-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
PFDA		335-76-2	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
MeFOSAA		2355-31-9	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
EtFOSAA		2991-50-6	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
PFUnA		2058-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
PFDoA		307-55-1	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
PFTrDA		72629-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
PFTeDA		376-06-7	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
Labeled Standa	rds	Туре	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	92	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
13C2-PFDA		SURR	83	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1
d5-EtFOSAA		SURR	93	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:13	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: V	VT1909241000KER									EPA Meth	od 537
Client Data					Lab	boratory Data					
Name:	Merit Laboratories, Inc	i.	Matrix:	Drinking Water	Lab	Sample:	1903280-0)5	Column:	BEH C18	
Project:	Statewide Biosolids		Date Collected:	24-Sep-19 10:00	Dat	te Received:	25-Sep-19	10:14			
Location:	3982 SE County Line										
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
PFHxA		307-24-4	ND		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
PFHpA		375-85-9	ND		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
PFHxS		355-46-4	ND		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
PFOA		335-67-1	ND		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
PFNA		375-95-1	ND		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
PFOS		1763-23-1	ND		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
PFDA		335-76-2	ND		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
MeFOSAA		2355-31-9	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
EtFOSAA		2991-50-6	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
PFUnA		2058-94-8	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
PFDoA		307-55-1	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
PFTrDA		72629-94-8	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
PFTeDA		376-06-7	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
Labeled Standa	rds	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	93	70 - 130			B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
13C2-PFDA		SURR	84	70 - 130			B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1
d5-EtFOSAA		SURR	87	70 - 130			B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:24	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: V	VT1909241020KER									EPA Meth	10d 537
Client Data					Lab	oratory Data					
Name:	Merit Laboratories, Inc		Matrix:	Drinking Water	Lab	Sample:	1903280-0)6	Column:	BEH C18	
Project:	Statewide Biosolids		Date Collected:	24-Sep-19 10:20	Dat	te Received:	25-Sep-19	10:14			
Location:	8463 Front Street										
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
PFHxA		307-24-4	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
PFHpA		375-85-9	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
PFHxS		355-46-4	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
PFOA		335-67-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
PFNA		375-95-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
PFOS		1763-23-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
PFDA		335-76-2	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
MeFOSAA		2355-31-9	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
EtFOSAA		2991-50-6	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
PFUnA		2058-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
PFDoA		307-55-1	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
PFTrDA		72629-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
PFTeDA		376-06-7	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
Labeled Standa	rds	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	88	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
13C2-PFDA		SURR	84	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1
d5-EtFOSAA		SURR	77	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 00:34	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: W	T1909241030KER								EPA Meth	nod 537
Client Data				Lal	boratory Data					
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lab	Sample:	1903280-0)7	Column:	BEH C18	
Project:	Statewide Biosolids	Date Colle		Da	te Received:	25-Sep-19	10:14		2211 010	
Location:	8421 Front Street		•			-				
Analyte	CAS Number	er Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	17		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
PFHxA	307-24-4	4		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
PFHpA	375-85-9	2		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
PFHxS	355-46-4	2		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
PFOA	335-67-1	6		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
PFNA	375-95-1	ND		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
PFOS	1763-23-1	3		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
PFDA	335-76-2	ND		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
MeFOSAA	2355-31-9	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
EtFOSAA	2991-50-6	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
PFUnA	2058-94-8	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
PFDoA	307-55-1	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
PFTrDA	72629-94-8	ND ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
PFTeDA	376-06-7	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
Labeled Standard	ds Type	% Recovery	Limits	_	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	97	70 - 13	0		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
13C2-PFDA	SURR	94	70 - 13	0		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1
d5-EtFOSAA	SURR	94	70 - 13	0		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:45	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: V	WR1909241040KER									EPA Meth	nod 537
Client Data					Lab	boratory Data					
Name:	Merit Laboratories, Inc	>.	Matrix:	Drinking Water	Lab	Sample:	1903280-0)8	Column:	BEH C18	
Project:	Statewide Biosolids		Date Collected:	24-Sep-19 10:40	Dat	te Received:	25-Sep-19	10:14			
Location:	8341 Front Street										
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	11		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
PFHxA		307-24-4	12		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
PFHpA		375-85-9	11		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
PFHxS		355-46-4	3		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
PFOA		335-67-1	31		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
PFNA		375-95-1	ND		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
PFOS		1763-23-1	6		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
PFDA		335-76-2	ND		2		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
MeFOSAA		2355-31-9	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
EtFOSAA		2991-50-6	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
PFUnA		2058-94-8	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
PFDoA		307-55-1	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
PFTrDA		72629-94-8	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
PFTeDA		376-06-7	ND		4		B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
Labeled Standa	ırds	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	93	70 - 130			B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
13C2-PFDA		SURR	95	70 - 130			B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1
d5-EtFOSAA		SURR	92	70 - 130			B9I0265	08-Oct-19	0.25 L	10-Oct-19 00:56	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: W	/T1909241050KER									EPA Meth	10d 537
Client Data Name: Project: Location:	Merit Laboratories, Inc Statewide Biosolids 8280 Front Street	·.	Matrix: Date Collected:	Drinking Water 24-Sep-19 10:50	Lab	oratory Data Sample: e Received:	1903280-09 25-Sep-19 10:14		Column:	BEH C18	
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	3		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
PFHxA		307-24-4	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
PFHpA		375-85-9	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
PFHxS		355-46-4	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
PFOA		335-67-1	2		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
PFNA		375-95-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
PFOS		1763-23-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
PFDA		335-76-2	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
MeFOSAA		2355-31-9	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
EtFOSAA		2991-50-6	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
PFUnA		2058-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
PFDoA		307-55-1	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
PFTrDA		72629-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
PFTeDA		376-06-7	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
Labeled Standar	·ds	Туре	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	115	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
13C2-PFDA		SURR	108	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1
d5-EtFOSAA		SURR	115	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:06	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: V	VT1909241110KER									EPA Meth	nod 537
Client Data					La	boratory Data					
Name:	Merit Laboratories, Inc.		Matrix:	Drinking Water	Lal	b Sample:	1903280-1	10	Column:	BEH C18	
Project:	Statewide Biosolids		Date Collected:	24-Sep-19 11:10		ite Received:	25-Sep-19	10:14	0.0.0	BEITETO	
Location:	8410 Front Street			•			•				
Analyte	CAS	S Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	3'	75-73-5	4		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
PFHxA	3	07-24-4	5		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
PFHpA	3	75-85-9	4		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
PFHxS	3.	55-46-4	3		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
PFOA	3:	35-67-1	10		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
PFNA	3	75-95-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
PFOS	17	763-23-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
PFDA	3:	35-76-2	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
MeFOSAA	23	355-31-9	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
EtFOSAA	29	991-50-6	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
PFUnA	20)58-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
PFDoA	31	07-55-1	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
PFTrDA	72	629-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
PFTeDA	3	76-06-7	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
Labeled Standar	rds T	уре	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	90	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
13C2-PFDA		SURR	81	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1
d5-EtFOSAA	9	SURR	111	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 01:49	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: V	VT1909241120KER									EPA Meth	10d 537
Client Data					Lab	oratory Data					
Name:	Merit Laboratories, Inc		Matrix:	Drinking Water	Lab	Sample:	1903280-1	1	Column:	BEH C18	
Project:	Statewide Biosolids		Date Collected:	24-Sep-19 11:20		te Received:	25-Sep-19	10:14		2211 010	
Location:	8301 Judevine										
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
PFHxA		307-24-4	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
PFHpA		375-85-9	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
PFHxS		355-46-4	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
PFOA		335-67-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
PFNA		375-95-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
PFOS		1763-23-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
PFDA		335-76-2	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
MeFOSAA		2355-31-9	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
EtFOSAA		2991-50-6	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
PFUnA		2058-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
PFDoA		307-55-1	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
PFTrDA		72629-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
PFTeDA		376-06-7	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
Labeled Standar	rds	Туре	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	93	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
13C2-PFDA		SURR	85	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1
d5-EtFOSAA		SURR	75	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:00	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: W	/T1909241145KER									EPA Meth	10d 537
Client Data					Lat	oratory Data					
Name:	Merit Laboratories, Inc		Matrix:	Drinking Water	Lab	Sample:	1903280-1	2	Column:	BEH C18	
Project:	Statewide Biosolids		Date Collected:	24-Sep-19 11:45		te Received:	25-Sep-19	10:14		BEITETE	
Location:	Palo Methodist Church	<u>l</u>									
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
PFHxA		307-24-4	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
PFHpA		375-85-9	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
PFHxS		355-46-4	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
PFOA		335-67-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
PFNA		375-95-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
PFOS		1763-23-1	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
PFDA		335-76-2	ND		2		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
MeFOSAA		2355-31-9	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
EtFOSAA		2991-50-6	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
PFUnA		2058-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
PFDoA		307-55-1	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
PFTrDA		72629-94-8	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
PFTeDA		376-06-7	ND		4		B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
Labeled Standar	·ds	Туре	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	88	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
13C2-PFDA		SURR	78	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1
d5-EtFOSAA		SURR	85	70 - 130			B9I0265	08-Oct-19	0.24 L	10-Oct-19 02:10	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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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.

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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-В
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.

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NELAP Accredited Test Methods

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

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

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MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B
Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue	EPA 1668A/C
by GC/HRMS	
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
P' ' I GGWPMG	ED 4 (12
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated	EPA 8280A/B
Dibenzofurans by GC/HRMS	LITTOZOOTUB
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	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	EPA 8280A/B							
Dibenzofurans by GC/HRMS								
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA							
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A							

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Container Types: P= HDPE, PJ= HDPE Jar

O = Other:

Vista Analytical Laboratory				CHAIN OF CUSTODY							For Laboratory Use Only Work Order #: 403280 Temp: Storage ID: P13, W2-2 Storage Secured: Yes					
Project ID:	Statewide Biosolids			PO#: _ 60588767.01			S	ampler: Kelly	Richart	(name)		(che	eck one); Rush (s	urcharge may a		ecify:
Invoice to:	Name		Compan	у		Add	ress				City	_	State	Ph#	2	Fax#
	Stephanie Kammer		EGLE			525	W. Alleg	an Street			Lansing		MI	517-897	7-1597	517-241-3571
George Au	ed by (printed name and signstin and by		4	Date 9/24/2019 Date	/	Time	00	3 Kw	m t	ed name and signal	13	1		09 25 Dat	19	Time 1014 Time
SHIP TO	Vista Analytical Laborator 1104 Windfield Way El Dorado Hills, CA 9576 Ph: (916) 673-1520; Fax. Jennifer Miller	52	0106	Method of Shipment: Tracking No.:		Cont	sis(es) Re		Tooling to the state of the sta	24 26 26 26 26 26 26 26 26 26 26 26 26 26	\\\ \\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			
Sai	mple ID	Date	Time	Location/Sample Description	On and	1	Wall I		\$ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1878	Co	mments	
M	VR1909240900KER	9/24/19	0900	4291 SE County Line	2	Р	DW					X	TZ		1,11,1011,0	
V	VR1909240920KER	9/24/19	0920	4091 SE County Line	2	Р	DW					Х	TZ			
И	VR1909240930KER	9/24/19	0930	4169 SE County Line	2	Р	DW					x	TZ			
v	VT1909240950KER	9/24/19	0950	4233 SE County Line	2	Р	DW		$\exists \Box$			x	TZ			
v	VT1909241000KER	9/24/19	1000	3982 SE County Line	2	Р	DW					х	TZ			
V	VT1909241020KER	9/24/19	1020	8463 Front Street	2	Р	DW					X	TZ			
W	VT1909241030KER	9/24/19	1030	8421 Front Street	2	Р	DW					х	TZ			
W	/R1909241040KER	9/24/19	1040	8341 Front Street	2	Р	DW					х	TZ			
W	VT1909241050KER	9/24/19	1050	8280 Front Street	2	Р	DW					X				
W	VT1909241110KER	9/24/19	1110	8410 Front Street	2	Р	DW					-	TZ			
Special Instru	actions/Comments:	Send Res	ults and	Acknowledgements to the li	st pro	vide	1		DOCUM	SEND MENTATION ESULTS TO:	Company: Address: City:	Ster EGI 525 Lan	phanie Kammer	Constitution State: MI Fax: 517	Zij	0: 30242

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Bottle Preservation Type: T = Thiosulfate,

TZ = Trizma;

Email: dorin.bogdan@aecom.com

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:



Container Types: P= HDPE, PJ= HDPE Jar

O = Other:

Vista Analytical Laboratory			CHAIN OF CUSTODY								Work C	Order# e ID: _	190	14/5-5 14/5-5	3280 Temp: Storage Secur	ed: Yes No 🗆		
Project ID:	Statewide Biosolids			PO#: 60588767.01	ý <u> </u>			Samp	pler: Ke	elly Ric		(name)			AT heck one):	Standard: Rush (sure	x 21 days charge may apply) ays 7 days \$	
nvoice to:	Name		Compan	у		Addr	ess						City			State	Ph#	Fax#
	Stephanie Kammer	0.00	EGLE			525 \	N. All	egan :	Street				Lansi	ng		MI	517-897-1597	517-241-3571
George Au	ed by (printed name and signstin ed by (printed name and signs)	H	7	Date 9/24/2019 Date	/	Time	1	C)	Km	V	d name and signated and signated displayed d		C	58	2	Date Date	Time 19 1014 Time
SHIP TO	: Vista Analytical Laborato 1104 Windfield Way El Dorado Hills, CA 9576 Ph: (916) 673-1520; Fax: Jennifer Miller	32	0106	Method of Shipment: ——— Tracking No.:			is(es) l	Reques	sted	T = 1		\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		/				
5-	mula ID	Data	T	Landing Complete Description	O. Septiment	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Main	1/10/20/20	15,0,051	Lies 0.24 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 /	108/m/80/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/	1, 38 9, 10 10 10 10 10 10 10 10 10 10 10 10 10	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Solution	15 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
	mple ID VT1909241120KER	9/24/19	1120	Location/Sample Description 8301 Judevine	2	P	DW	(3)	13/	3/3	13	15 8	18/	3/	K TZ, Old	Fire Station	Commen	its
	VT1909241145KER	9/24/19	1145	Palo Methodist Church	2	Р	DW			+	-		+++			a war a result of	thodist Church	
		3/24/13	1145	, ale mediate ender						+				-	12,1 alc	omica me	inodist Online	
					-									+				
														1				
pecial Instru	uctions/Comments:	Send Res	sults and	Acknowledgements to the	list pro	video					OCUM	SEND MENTATION ESULTS TO:	Compa Addre C Pho	ny: E0 ss: 52 tity: La ne: 51	25 W. Alleg ansing 17-897-159	an Street, C	Fax: 517-241-	Zip: 30242

For Laboratory Use Only apr 09/25/19

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:

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Bottle Preservation Type: T = Thiosulfate,

TZ = Trizma:



Sample Log-In Checklist

Vista Work Orde	r#: 190328	0			Page #		of _	_	
Samples Arrival:	Date/Time 09 25 19 1	014	Initials:	2	Location: Shelf/Rack				
Logged In:	09/25/19	1337	Initials:	,	Location: Shelf/Rack	12-13	/WR-		
Delivered By:	FedEx UPS	On Tra	ac GSO	DHL	Hand Deliver	b		Other	
Preservation:	(ce	Blu	ue Ice		Dry Ice		No	ne	
Temp °C: .9	(uncorrected)	Probe use	ed: Y /N)	Thermome	ter ID:	Je-	3	
				· · · · · · · · · · · · · · · · · · ·		YES	NO	NA	
Adequate Sample	e Volume Receive	d?				/			
Holding Time Acc	ceptable?					/			
Shipping Contain	er(s) Intact?					/			
Shipping Custody	Seals Intact?							1	
23.41.00	entation Present?					1	-		
Airbill #2		94 66	96 250	02		1			

Chain of Custody / Sample D	/					
COC Anomaly/Sample Acce	ptance Form com	pleted?			1	
If Chlorinated or Drinking Wa	ater Samples, Acc	ceptable Pres	servation?	1		
Preservation Documented:	Na₂S₂O₃ Other	Trizma	None	Yes	No	NA
Shipping Container	Vista	Client	Retain	Return	Disp	ose

Comments:

ID.: LR - SLC

Sample Container Intact?

Sample Custody Seals Intact?

Rev No.: 3

Rev Date: 05 October 2018

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April 09, 2020

Vista Work Order No. 2000608

Mr. Dorin Bogdan AECOM 3950 Sparks Drive SE Grand Rapids, MI 49546

Dear Mr. Bogdan,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 19, 2020 under your Project Name 'MPART - Palo, Ionia County, MI'.

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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

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Vista Work Order No. 2000608 Case Narrative

Sample Condition on Receipt:

Two drinking water samples and one aqueous 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 Chain-of-Custody (CoC) was received by email on March 19, 2020.

Analytical Notes:

EPA Method 537, Rev. 1.1

The samples were extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

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 Laboratory Fortified Blank (LFB) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB recoveries were within the method acceptance criteria.

A Laboratory Fortified Sample Matrix (LFSM) and Laboratory Fortified Sample Matrix Duplicate (LFSMD) were performed on sample "WSFT2003180950ST". The analyte recovery of PFBS in the MS was greater than 130%. All other analyte recoveries and RPDs were within the method acceptance criteria.

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

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2000608-01	FB2003180940ST	18-Mar-20 09:40	19-Mar-20 08:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000608-02	WSFT2003180950ST	MS/MSD18-Mar-20 09:50	19-Mar-20 08:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2000608-03	WSFT2003180950ST-FD	18-Mar-20 09:50	19-Mar-20 08:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 2000608 Client Project: MPART - Palo, Ionia County, MI

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ANALYTICAL RESULTS

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Sample ID: L	ample ID: LRB										
Client Data					Lab	oratory Data					
Name:	AECOM		Matrix:	Aqueous	Lab	Sample:	B0C0257-	BLK1	Column:	BEH C18	
Project:	MPART - Palo, Ionia	County, MI								2211 010	
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxA		307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHpA		375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHxS		355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOA		335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFNA		375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOS		1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDA		335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
MeFOSAA		2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
EtFOSAA		2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFUnA		2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDoA		307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTrDA		72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTeDA		376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
Labeled Standar	ds	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	98	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
13C2-PFDA		SURR	93	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1

70 - 130

RL - Reporting limit

SURR

d5-EtFOSAA

Results reported to RL.

87

Reporting convention specified by MI DEQ.

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

0.25 L

06-Apr-20 17:08

B0C0257 31-Mar-20

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Sample ID: LFB

EPA Method 537 Rev 1.1

Client Data Laboratory Data

Name: AECOM Matrix: Aqueous Lab Sample: B0C0257-BS1 Column: BEH C18
Project: MPART - Palo, Ionia County, MI

CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
375-73-5	43	35	123	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
307-24-4	46	40	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
375-85-9	48	40	121	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
355-46-4	42	36	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
335-67-1	43	40	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
375-95-1	45	40	114	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
1763-23-1	40	37	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
335-76-2	42	40	104	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
2355-31-9	37	40	93	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
2991-50-6	36	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
2058-94-8	40	40	99	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
307-55-1	37	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
72629-94-8	36	40	90	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
376-06-7	35	40	87	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
	Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
	SURR		110	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
	SURR		101	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
	SURR		90	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
	375-73-5 307-24-4 375-85-9 355-46-4 335-67-1 375-95-1 1763-23-1 335-76-2 2355-31-9 2991-50-6 2058-94-8 307-55-1 72629-94-8	375-73-5 43 307-24-4 46 375-85-9 48 355-46-4 42 335-67-1 43 375-95-1 45 1763-23-1 40 335-76-2 42 2355-31-9 37 2991-50-6 36 2058-94-8 40 307-55-1 37 72629-94-8 36 376-06-7 35 Type SURR SURR	375-73-5	375-73-5 43 35 123 307-24-4 46 40 116 375-85-9 48 40 121 355-46-4 42 36 116 335-67-1 43 40 108 375-95-1 45 40 114 1763-23-1 40 37 108 335-76-2 42 40 104 2355-31-9 37 40 93 2991-50-6 36 40 91 2058-94-8 40 40 99 307-55-1 37 40 91 72629-94-8 36 40 90 376-06-7 35 40 87 Type % Rec SURR 110 SURR 110	375-73-5 43 35 123 70 - 130 307-24-4 46 40 116 70 - 130 375-85-9 48 40 121 70 - 130 355-46-4 42 36 116 70 - 130 335-67-1 43 40 108 70 - 130 375-95-1 45 40 114 70 - 130 335-76-2 42 40 104 70 - 130 2355-31-9 37 40 93 70 - 130 2991-50-6 36 40 91 70 - 130 2058-94-8 40 40 99 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 90 70 - 130 307-55-1 37 40 90 70 - 130 307-55-1 37 40 91 70 - 130	375-73-5	375-73-5 43 35 123 70 - 130 B0C0257 307-24-4 466 40 116 70 - 130 B0C0257 375-85-9 48 40 121 70 - 130 B0C0257 335-46-4 42 36 116 70 - 130 B0C0257 335-67-1 43 40 108 70 - 130 B0C0257 375-95-1 45 40 114 70 - 130 B0C0257 1763-23-1 40 37 108 70 - 130 B0C0257 335-76-2 42 40 104 70 - 130 B0C0257 2355-31-9 37 40 93 70 - 130 B0C0257 2991-50-6 36 40 91 70 - 130 B0C0257 2058-94-8 40 40 99 70 - 130 B0C0257 307-55-1 37 40 91 70 - 130 B0C0257 307-55-1 37 40 99 70 - 130 B0C0257 307-55-1 37 40 91 70 - 130 B0C0257 307-55-1 37 40 91 70 - 130 B0C0257 307-55-1 37 40 91 70 - 130 B0C0257 72629-94-8 36 40 90 70 - 130 B0C0257 72629-94-8 36 40 90 70 - 130 B0C0257 376-06-7 35 40 87 70 - 130 B0C0257 376-06-7 35 40 87 70 - 130 B0C0257 376-06-7 35 40 87 70 - 130 B0C0257 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-	375-73-5	375-73-5	375-73-5

Data Reported per Michigan DEQ instructions.

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Sample ID: FE	Sample ID: FB2003180940ST EPA Method 537 Rev 1.1									
Client Data Name: Project:	AECOM MPART - Palo, Ionia County, MI	Matrix: Date Collected:	Aqueous 18-Mar-20 09:40	Lab	oratory Data Sample: e Received:	2000608-0 19-Mar-20		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
Labeled Standard	ds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	108	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1
13C2-PFDA	SURR	95	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	
d5-EtFOSAA	SURR	95	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:17	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: V	Sample ID: WSFT2003180950ST EPA Method 537 Rev 1.1									
Client Data				Lab	oratory Data					
Name:	AECOM	Matrix:	Drinking Water	Lab	Sample:	2000608-0)2	Column:	BEH C18	
Project:	MPART - Palo, Ionia County, MI	Date Collected:	18-Mar-20 09:50	Dat	e Received:	19-Mar-20	0 08:41			
Location:	8496 Judevine Rd									
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
Labeled Standa	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	106	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
13C2-PFDA	SURR	95	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1
d5-EtFOSAA	SURR	98	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:28	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: WSFT2003180950ST EPA Method 537 Rev 1.1

2000608-02 AECOM Source Lab Sample: Name: Lab Sample: B0C0257-MS1/B0C0257-MSD1 31-Mar-20 Date Extracted: Project: QC Batch: B0C0257 MPART - Palo, Ionia County, MI BEH C18 Column:

Samp Size: 0.24/0.25 L Matrix: Aqueous

	CACN	Sample	LFSM	LFSM	LFSM	LFSM	LFSMD	LFSMD	LFSM		LFSMD	%Rec	RPD	LFSM	LFSM	LFSMD	LFS
Analyte	CAS Number	(ng/L)	(ng/L)	Spike	% Rec	Quals	(ng/L)	Spike	D	RPD	Quals	Limits	Limits	Analyzed	Dil	Analyzed	MD
PFBS	375-73-5	ND	49	37	131	Н	43	36	121	8		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
PFHxA	307-24-4	ND	50	42	119		45	40	113	6		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
PFHpA	375-85-9	ND	53	42	125		47	40	116	8		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
PFHxS	355-46-4	ND	50	38	130		43	37	116	11		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
PFOA	335-67-1	ND	47	42	111		43	40	106	4		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
PFNA	375-95-1	ND	50	42	118		45	40	111	6		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
PFOS	1763-23-1	ND	44	39	112		38	37	102	10		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
PFDA	335-76-2	ND	47	42	112		41	40	102	10		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
MeFOSAA	2355-31-9	ND	46	42	109		39	40	96	13		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
EtFOSAA	2991-50-6	ND	44	42	106		38	40	95	11		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
PFUnA	2058-94-8	ND	44	42	106		39	40	97	9		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
PFDoA	307-55-1	ND	40	42	96		36	40	88	8		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
PFTrDA	72629-94-8	ND	39	42	93		35	40	87	7		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
PFTeDA	376-06-7	ND	38	42	91		34	40	85	6		70-130	30	06-Apr-20 17:31	1	06-Apr-20 17:42	1
					LFSM	LFSM			LFSMD		LFSMD			LFSM	LFSM	LFSMD	LFS

Labeled Standards % Rec Quals Limits Analyzed Dil Analyzed MD % Rec Type **Quals** 13C2-PFHxA 98 06-Apr-20 17:31 06-Apr-20 17:42 SURR 113 70-130 1 13C2-PFDA 06-Apr-20 17:31 06-Apr-20 17:42 104 90 70-130 **SURR** d5-EtFOSAA 85 06-Apr-20 17:31 06-Apr-20 17:42 101 70-130 SURR

Reporting convention specified by MI DEQ.

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Sample ID: WSFT2003180950ST-FD EPA Method 537 Rev 1.1										
Client Data Name: Project: Location:	AECOM MPART - Palo, Ionia County, MI 8496 Judevine Rd	Matrix: Date Collected:	Drinking Water 18-Mar-20 09:50	Lab	oratory Data Sample: e Received:	2000608-03 19-Mar-20 08:41		Column: BEH C18		
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	102	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
13C2-PFDA	SURR	97	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1
d5-EtFOSAA	SURR	91	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 20:39	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

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

Work Order 2000608 Page 11 of 19

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.

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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-В
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.

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NELAP Accredited Test Methods

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

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

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MATRIX: Non-Potable Water						
Description of Test	Method					
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B					
Dilution GC/HRMS						
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	EPA 8280A/B					
Dibenzofurans by GC/HRMS						
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA					
Dibenzofurans (PCDFs) by GC/HRMS	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	EPA 8280A/B
Dibenzofurans by GC/HRMS	
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

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Work Order 2000608

- revised COC -- received via email 03/19/20 1258 wws 03/19/20

CHAIN OF CUSTODY

For Laboratory Use Only	
For Laboratory Use Only Work Order #: 2000608	Temp:_3.3 °C
Storage ID: R-13 WR-2	Storage Secured: Yes ☑ No ☐

Page 16 of 19

roject ID: MPART - Palo, lor voice to: Name Mike Jury		MI Compan EGLE		4	Addr	ess	Sample			kettle & Kaitlyn Eicholtz (name)	City		AT eck one):	Standard: Rush (surch 14 day State	x 21 days narge may apply) s 7 days S Ph# 517-242-9578	pecify: Fax#
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- see revised COC-

CHAIN OF CUSTODY

For Laboratory Use Only		
Work Order #: 200608	Temp: 3	3
Storage ID: R-13, WR-2	Storage Secured:	Yes 🗹 N

Project ID: MPART - Palo, I	onia County	, MI	PO#:60560354.1	4			_Sai	mpler	Sara	Thu	rkettle & Kaitlyn Eic (name)	holtz	TA (che		x 21 days harge may apply) /s 7 days Sp	pecify:
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FB2003180940ST	3/18/20	9:40	***************************************	2	Р	AQ							X			
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WSFT2003180950ST-FD	3/18/20	9:50	8496 Judevine Rd	2	Р	DW							х	Field Duplicate		
Special Instructions/Comments:	Send Resu	ults and A	Acknowledgements to: See e	mail fo	r distr	ributio	n list.	-			SEND CUMENTATION D RESULTS TO:	Company Address City: Phone:	525 Lans 517-	W. Allegan Street, Co	THE RESERVE THE TAXABLE PARTY.	o: <u>30242</u>
Container Types: P= HDPE, PJ O = Other: Work Order 2000			Bottle Preserva TZ = Trizma:				sulfat	e,			Matrix Types: AQ = SL = Sludge, SO = S	Aqueous, DW oil, WW = Was	= Drin	nking Water, EF = Effluer er, B = Blood/Serum, O =	t, PP = Pulp/Paper, S Other: Page 17 c	D = Sediment



Sample Log-In Checklist

Vista Work Orde	er#:200	808			Page # _TAT	<u>1</u> std	of	
Samples Arrival:	Date/Time 3 19/20 08	:41	Initials: WRW		cation:	k: /\	JA	
Delivered By:	FedEx UPS	On Trac	GLS	DHL	Har Delive	7.27	Otl	her
Preservation:	(Ice	Blue	e Ice	D	ry Ice		No	ne
Temp °C: 3.3	D	robe use	d: Y (N)	The	ermome	eter ID:	IR-	3
Chinaina Carat		n Caller State of the State of				YES	NO	NA
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COC Anomaly/Sar	mple Acceptance Fo	rm comple	eted?	1 2 3			(-/

Comments:

ID.: LR - SLC

Rev No.: 5

Rev Date: 01/21/2020

Page: 1 of 1

CoC/Label Reconciliation Report WO# 2000608

LabNumber CoC Sample ID		SampleAlias	Sample Date/Time	Container	Sample BaseMatrix Comments
2000608-01 A FB2003180940ST	Ø		18-Mar-20 09:40 🚺	HDPE Bottle, 250 mL	Aqueous
2000608-01 B FB2003180940ST	Ø		18-Mar-20 09:40	HDPE Bottle, 250 mL	Aqueous
2000608-02 A WSFT2003180950ST		8496 Judevine Rd	18-Mar-20 09:50	HDPE Bottle, 250 mL	Aqueous MS/MSD
2000608-02 B WSFT2003180950ST	V	8496 Judevine Rd	18-Mar-20 09:50	HDPE Bottle, 250 mL	Aqueous MS/MSD
2000608-02 C WSFT2003180950ST		8496 Judevine Rd	18-Mar-20 09:50	HDPE Bottle, 250 mL	Aqueous MS/MSD
2000608-02 D WSFT2003180950ST	ď	8496 Judevine Rd	18-Mar-20 09:50	HDPE Bottle, 250 mL	Aqueous MS/MSD
2000608-02 E WSFT2003180950ST	V	8496 Judevine Rd	18-Mar-20 09:50	HDPE Bottle, 250 mL	Aqueous MS/MSD
2000608-02 F WSFT2003180950ST	V	8496 Judevine Rd	18-Mar-20 09:50	HDPE Bottle, 250 mL	Aqueous MS/MSD
2000608-03 A WSFT2003180950ST-FD	abla	8496 Judevine Rd	18-Mar-20 09:50 📈	HDPE Bottle, 250 mL	Aqueous
2000608-03 B WSFT2003180950ST-FD	V	8496 Judevine Rd	18-Mar-20 09:50	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	Comments:
Sample Container Intact?	V			
Sample Custody Seals Intact?			J	
Adequate Sample Volume?	1			
Container Type Appropriate for Analysis(es)	1			
Preservation Documented: Na2S2O3 Trizma None Other	1			
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	/			

Verifed by/Date: WWS 63 19 20

Printed: 3/19/2020 1:59:35PM



April 09, 2020

Vista Work Order No. 2000607

Mr. Dorin Bogdan AECOM 3950 Sparks Drive SE Grand Rapids, MI 49546

Dear Mr. Bogdan,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 19, 2020 under your Project Name 'MPART - Palo, Ionia County, MI'.

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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Work Order 2000607 Page 1 of 15

Vista Work Order No. 2000607 Case Narrative

Sample Condition on Receipt:

One drinking water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

EPA Method 537, Rev. 1.1

The sample was extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

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

A Laboratory Fortified Blank (LFB) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB recoveries were within the method acceptance criteria.

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

Work Order 2000607 Page 2 of 15

TABLE OF CONTENTS

Case Narrative	1
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Sample Inventory	4
Analytical Results	5
Qualifiers	9
Certifications	10
Sample Receipt	13

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Sample Inventory Report

Vista Client
Sample ID Sample ID Sampled Received Components/Containers

2000607-01 WT2003181015ST 18-Mar-20 10:15 19-Mar-20 08:41 HDPE Bottle, 250 mL
HDPE Bottle, 250 mL

Vista Project: 2000607 Client Project: MPART - Palo, Ionia County, MI

Work Order 2000607 Page 4 of 15

ANALYTICAL RESULTS

Work Order 2000607 Page 5 of 15



Sample ID: 1	LRB								EP	A Method 537	Rev 1.1
Client Data					Lab	oratory Data					
Name:	AECOM		Matrix:	Aqueous	Lab	Sample:	B0C0257-	BLK1	Column:	BEH C18	
Project:	MPART - Palo, Ionia	County, MI		-		-				2211 010	
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxA		307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHpA		375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxS		355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOA		335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFNA		375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOS		1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDA		335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
MeFOSAA		2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
EtFOSAA		2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFUnA		2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDoA		307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTrDA		72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTeDA		376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
Labeled Standa	ards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	98	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
13C2-PFDA		SURR	93	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1

70 - 130

RL - Reporting limit

SURR

d5-EtFOSAA

Results reported to RL.
Reporting convention specified by MI DEQ.

87

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

0.25 L

06-Apr-20 17:08

B0C0257 31-Mar-20

Work Order 2000607 Page 6 of 15



Sample ID: LFB

EPA Method 537 Rev 1.1

Client Data Laboratory Data

Name: AECOM Matrix: Aqueous Lab Sample: B0C0257-BS1 Column: BEH C18
Project: MPART - Palo, Ionia County, MI

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	43	35	123	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxA	307-24-4	46	40	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHpA	375-85-9	48	40	121	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxS	355-46-4	42	36	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOA	335-67-1	43	40	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFNA	375-95-1	45	40	114	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOS	1763-23-1	40	37	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDA	335-76-2	42	40	104	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
MeFOSAA	2355-31-9	37	40	93	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
EtFOSAA	2991-50-6	36	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFUnA	2058-94-8	40	40	99	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDoA	307-55-1	37	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTrDA	72629-94-8	36	40	90	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTeDA	376-06-7	35	40	87	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
Labeled Standards		Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR		110	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
13C2-PFDA		SURR		101	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
d5-EtFOSAA		SURR		90	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1

Data Reported per Michigan DEQ instructions.

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Sample ID: W	VT2003181015ST							EP.	A Method 537	Rev 1.1
Client Data Name: Project:	AECOM MPART - Palo, Ionia County, MI	Matrix: Date Collected:	Drinking Water 18-Mar-20 10:15	Lab	Sample: e Received:	2000607-0 19-Mar-20		Column:	BEH C18	
Location:	8337 Church St	Date Conceica.	10-1viai-20 10.13	Date	c Received.	1)-Wai-20	7 00.41			
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	100	70 - 130			B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1
13C2-PFDA	SURR	94	70 - 130			B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	
d5-EtFOSAA	SURR	81	70 - 130			B0C0257	31-Mar-20	0.24 L	06-Apr-20 20:06	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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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.

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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-В
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.

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NELAP Accredited Test Methods

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

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

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0 = Othe Work Order 2000607_

CHAIN OF CUSTODY

TZ = Trizma: TZ

For Laboratory Use Only		
Work Order #: 200607	Temp: 3.3	3
Storage ID: 2-13, WR-2	Storage Secured:	Yes 🗹 N

SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: Page 13 of 15

Project ID:		Palo, lo	nia County,	MI	PO#: 60560354.1	4			_Sar	npler:	Sara	Thui	rkettle & Kaitlyn Eich (name)	oltz			andard: ush (surc 14 day	x 21 days harge may apply) /s 7 days Sp	ecify:
Invoice to:	Name			Compan	у		Addı	ress		_				City		St	ate	Ph#	Fax#
	Mike Jury			EGLE			Sag	inaw E	Зау [Distri	ct Off	ice		Sagii	naw	M	ľ.	517-242-9578	
Relinquishe Kaitlyn Eicl		I name	and signatur	r e)	Date 3/8/2020		Time			Rec	eived	by (p	orinted name and si	gnature)		w. Mik	W	Date 3/19/20	Time
Relinquishe	d by (printed	l name	and signatu	re)	Date		Time	9		Rec	eived	by (orinted name and si	gnature)			1	Date	Time
SHIP TO:	Vista Analy 1104 Wind El Dorado (916) 673-	field Wa	ay	3-0106	Method of Shipment: Tracking No.:		Conta	is(es) I	5)		537 / 1/2/2/2	/ st./	8904 898 LSJ MOLE ED BROOK ED	\$ \\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \		1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	/		
Sar	mple ID		Date	Time	Location/Sample Description	1	Time of the second	Water Land	1/2	3/2	13	1111	Sept 1. Sept 1	12	1000			Comments	
WT20	03181015S	Т	3/18/20	10:15	8337 Church St	2	Р	DW								x			
											H								
Special Instru	ctions/Comm	ents:	Send Resu	lts and A	Acknowledgements to: See e	mail fo	r distr	ibution	n list.				SEND CUMENTATION D RESULTS TO:	Compa Addre	any: E	25 W. Allegan S		onstitution Hall, 1st	
O4-iT-					Datala Davis				11 - 401-	-				Pho Em	ne: 5	ansing 17-897-1597 ammerS@michi		State: MI Zip Fax: 517-241-35	



Sample Log-In Checklist

Vista Work Orde	ivered By: FedEx UPS On Trac GLS DHL Hand Delivered Other Servation: (Ice Blue Ice Dry Ice None np °C: 3,3 (uncorrected) probe used: Y IN Thermometer ID: IR 3 pping Container(s) Intact? Trk # 1709 7193 6143										
Samples Arrival:		DBi41 WRW					114				
Delivered By:	FedEx UP:	S On Tr	ac	GLS	DH		1.11		Other		
Preservation:		В	Blue Ice				Dry Ice			None	
Temp °C: 32		60		11.				_			
AND THE PROPERTY OF THE PARTY OF		Probe used: Y (N)				Thermometer ID: 183					
			## ##			建城		VEQ	- NO	NIA	
Shipping Contain	er(s) Intact?					to the other		1/3	NO	NA	
								1/			
Airbill		09 719	3	Ca142	3			1			
Shipping Docume	entation Present?		1	WI I	1			1/			
Shipping Containe		(Vista)	T	Client	Re	tain	Re	turn	Disp	020	
Chain of Custody	/ Sample Docum	entation Pro	ese			V-00000	1		Disp	036	

Logged In:	03 19 20 1344	Initials:	Location: R-13 WR-2 Shelf/Rack: A-1, E-4
------------	---------------	-----------	-------------------------------------------

Comments:

ID .: LR - SLC

Rev No.: 5

Chain of Custody / Sample Documentation Complete?

Rev Date: 01/21/2020

Page: 1 of 1

CoC/Label Reconciliation Report WO# 2000607

LabNumber CoC Sample ID		SampleAlias	Sample Date/Time	Container	Sample BaseMatrix Comments
2000607-01 A WT2003181015ST	 ✓	8337 Church St	18-Mar-20 10:15	HDPE Bottle, 250 mL	Aqueous
2000607-01 B WT2003181015ST	☑	8337 Church St	18-Mar-20 10:15	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	Comments
Sample Container Intact?	1			
Sample Custody Seals Intact?			V	
Adequate Sample Volume?	1			
Container Type Appropriate for Analysis(es)	1			
Preservation Documented: Na2S2O3 Trizma None Other	✓			
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	1			1

Verifed by/Date: ULUS 03 19 20

Printed: 3/19/2020 1:47:25PM



April 09, 2020

Vista Work Order No. 2000606

Mr. Dorin Bogdan AECOM 3950 Sparks Drive SE Grand Rapids, MI 49546

Dear Mr. Bogdan,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 19, 2020 under your Project Name 'MPART - Palo, Ionia County, MI'.

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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

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Vista Work Order No. 2000606 Case Narrative

Sample Condition on Receipt:

One drinking water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

EPA Method 537, Rev. 1.1

The sample was extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

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

A Laboratory Fortified Blank (LFB) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB recoveries were within the method acceptance criteria.

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

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Case Narrative	1
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Qualifiers	9
Certifications	10
Sample Receipt	13

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Sample Inventory Report

Vista Client Sample ID Sampled Received Components/Containers

2000606-01 WR2003181030ST 18-Mar-20 10:30 19-Mar-20 08:41 HDPE Bottle, 250 mL HDPE Bottle, 250 mL

Vista Project: 2000606 Client Project: MPART - Palo, Ionia County, MI

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ANALYTICAL RESULTS

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Sample ID: 1	LRB								EP	A Method 537	Rev 1.1
Client Data					Lab	oratory Data					
Name:	AECOM		Matrix:	Aqueous	Lab	Sample:	B0C0257-	BLK1	Column:	BEH C18	
Project:	MPART - Palo, Ionia	County, MI		-		-				2211 010	
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxA		307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHpA		375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxS		355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOA		335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFNA		375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOS		1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDA		335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
MeFOSAA		2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
EtFOSAA		2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFUnA		2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDoA		307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTrDA		72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTeDA		376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
Labeled Standa	ards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	98	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
13C2-PFDA		SURR	93	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1

70 - 130

RL - Reporting limit

SURR

d5-EtFOSAA

Results reported to RL.
Reporting convention specified by MI DEQ.

87

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

0.25 L

06-Apr-20 17:08

B0C0257 31-Mar-20

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Sample ID: LFB

EPA Method 537 Rev 1.1

Client Data Laboratory Data

Name: AECOM Matrix: Aqueous Lab Sample: B0C0257-BS1 Column: BEH C18
Project: MPART - Palo, Ionia County, MI

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	43	35	123	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxA	307-24-4	46	40	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHpA	375-85-9	48	40	121	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxS	355-46-4	42	36	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOA	335-67-1	43	40	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFNA	375-95-1	45	40	114	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOS	1763-23-1	40	37	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDA	335-76-2	42	40	104	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
MeFOSAA	2355-31-9	37	40	93	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
EtFOSAA	2991-50-6	36	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFUnA	2058-94-8	40	40	99	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDoA	307-55-1	37	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTrDA	72629-94-8	36	40	90	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTeDA	376-06-7	35	40	87	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
Labeled Standards		Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR		110	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
13C2-PFDA		SURR		101	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
d5-EtFOSAA		SURR		90	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1

Data Reported per Michigan DEQ instructions.

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Sample ID: W	/R2003181030ST							EP.	A Method 537	Rev 1.1
Client Data Name: Project:	AECOM MPART - Palo, Ionia County, MI	Matrix: Date Collected:	Drinking Water 18-Mar-20 10:30	Lab	ooratory Data Sample: e Received:	2000606-0 19-Mar-20		Column:	BEH C18	
Location:	8447 Church St									
Analyte	CAS Number	Conc. (ng/L)		ŘL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
Labeled Standar	ds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98	70 - 130			B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
13C2-PFDA	SURR	90	70 - 130			B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1
d5-EtFOSAA	SURR	86	70 - 130			B0C0257	31-Mar-20	0.24 L	06-Apr-20 19:55	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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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.

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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-В
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.

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NELAP Accredited Test Methods

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

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

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0 = Othework Order 2000606_

CHAIN OF CUSTODY

TZ = Trizma: TZ

For Laboratory Use Only		
Work Order #: 200606	Temp: 3.2	
Storage ID: R-13, IDR-2	Storage Secured:	Yes V

SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: Page 13 of 15

Mike Jury EGLE Saginaw Bay District Office Saginaw Mi 517-242-9578 Relinquished by (printed name and signature) Date Time Received b	Project ID: MPART - Pa	lo, Ionia County	, MI	PO#: 60560354.1	4			_Sam	npler:	Sara	Thur	kettle & Kaitlyn Eich (name)	oltz			andard: ish (surch	x 21 days narge may apply) s 7 days Sp	ecify:
Relinquished by (printed name and signature) Java 2020 17:00 Received by (printed name and signature) Date Time Received by (printed name and signatur	Invoice to: Name		Compar	ny		Add	ress						City		Sta	ate	Ph#	Fax#
Relinquished by (printed name and signature) Date Time Received by (printed name and signature) SHIP TO: Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills CA 95782 (916) 673-1520 *Fax (916) 673-0106 Add Analysis(es) Requested (916) 673-1520 *Fax (916) 673-0106 Tracking No.: Sample ID Date Time Date Tracking No.: Sample ID Date Time Location/Sample Description WR2003181030ST 3/18/20 10:30 8447 Church St 2 P DW Special Instructions/Comments See email for distribution list. See mail for distribution list. See mail for distribution list. See email for distribution list. See mail for distribution list. OCUMENTATION AND RESULTS TO: And RESULTS TO: And RESULTS TO: And Results and Acknowledgements to: See Stab Allegan Street, Constitution Hall, 1st South City, Lansing Stab Stab Allegan Street, Constitution Hall, 1st South City, Lansing Stab Stab Allegan Street, Constitution Hall, 1st South City, Lansing Stab Stab Allegan Street, Constitution Hall, 1st South City, Lansing Stab Stab Allegan Street, Constitution Hall, 1st South City, Lansing Stab Stab Allegan Street, Constitution Hall, 1st South City, Lansing Stab Stab Allegan Street, Constitution Hall, 1st South City, Lansing Stab Stab Allegan Street, Constitution Hall, 1st South City, Lansing Stab Stab Allegan Street, Constitution Hall, 1st South City, Lansing Stab Stab Allegan Street, Constitution Hall, 1st South City, Lansing Stab Stab Allegan Street, Constitution Hall, 1st South City, Lansing Stab Stab Allegan Street, Constitution Hall, 1st South City, Lansing Stab Stab Stab Stab Stab Stab Stab Stab	Mike Jury		EGLE			Sag	inaw I	Bay D	istric	t Off	ice		Sagir	naw	MI		517-242-9578	
Relinquished by (printed name and signature) Date Time Received 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 (916) 673-1320 * Fax (916) 673-0106 ATTN: Tracking No.: Tracking No.: Sample ID Date Time Location/Sample Description WR2003181030ST 3/18/20 10:30 8447 Church St 2 P DW DOUBLE Time See email for distribution list. ONA RESULTS TO: Name: Stephanie Kammer Company: EGLE Address: 525 W. Allegan Street, Constitution Hall, 1st South). City, Lansing State: MI Zip: 30342 City, Lansing State: MI Zip: 30342 State: MI Zip: 30344 Size Stay Stay State: MI Zip: 30344 Size Stay Stay Stay Stay Stay Stay Stay Stay		name and signatu	re)						Rece	eived	by (p	printed name and si	gnature)	l.	Ulla Ru	1	ai 1	Time
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Email: <u>KammerS@michigan.gov</u>													Pho	one: 51	7-897-1597	gan.gov	and the second s	



Sample Log-In Checklist

Vista Work Orde	er#:	200	0606				age #	std	of	
Samples Arrival:	Date/Time 3 19/20	08	ત્યા	Initials: WRW		Loca	tion: /Racl	c:	VA	
Delivered By:	FedEx	JPS ×	On Tra	c GLS	DHL		Han Delive	100	Ot	her
Preservation:	(Ice)	Blu	e Ice		Dry	Ice		No	ne
Temp °C: 3		d) P	robe use	ed: Y I(N)		Therr	nome	ter ID:	IR-	3
			an amin'ny samonana Ny INSEE dia mampiasa ny kaominina mpikambana amin'ny faritr'ny taona amin'ny faritr'ny faritr'ny faritr'ny fa					YES	NO	NA
Shipping Contain	er(s) Intact?							V		
Shipping Custod	Seals Intact?						= 1	V		
Airbill	Trk#	104	718	3 614	3			/		
Shipping Docume	entation Preser	nt?		76.1				1/		
Shipping Contain	er	(Vi	ista	Client	Re	tain	Re	turn	Dist	ose
Chain of Custody	/ Sample Doci	ument	ation Pre	sent?				1		
Chain of Custody								V		
Holding Time Acc								V		
Logged In:	Date/Time	1337		Initials:		Locat		R-13,	*	
COC Anomaly/Sa	mple Acceptar	ice Fo	rm comp	leted?					1	/

Comments:

ID.: LR - SLC

Rev No.: 5

Rev Date: 01/21/2020

Page: 1 of 1

CoC/Label Reconciliation Report WO# 2000606

LabNumber CoC Sample ID		SampleAlias	Sample Date/Time	Container	Sample BaseMatrix Comments
2000606-01 A WR2003181030ST	Ø	8447 Church St	18-Mar-20 10:30 📝	HDPE Bottle, 250 mL	Aqueous
2000606-01 B WR2003181030ST	☑	8447 Church St	18-Mar-20 10:30	HDPE Bottle, 250 mL	Aqueous

Comments:

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?	V		
Sample Custody Seals Intact?			1
Adequate Sample Volume?	V		
Container Type Appropriate for Analysis(es)	1		
Preservation Documented: Na2S2O3 Trizma None Other	1		
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	1		

Verifed by/Date: WUS 03 19 20

Printed: 3/19/2020 1:42:31PM

Work Order 2000606



April 09, 2020

Vista Work Order No. 2000605

Mr. Dorin Bogdan AECOM 3950 Sparks Drive SE Grand Rapids, MI 49546

Dear Mr. Bogdan,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 19, 2020 under your Project Name 'MPART - Palo, Ionia County, MI'.

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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Work Order 2000605 Page 1 of 15

Vista Work Order No. 2000605 Case Narrative

Sample Condition on Receipt:

One drinking water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

EPA Method 537, Rev. 1.1

The sample was extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

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

A Laboratory Fortified Blank (LFB) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB recoveries were within the method acceptance criteria.

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

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Analytical Results	5
Qualifiers	9
Certifications	10
Sample Receipt	13

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Sample Inventory Report

Vista Client
Sample ID Sample ID Sampled Received Components/Containers

2000605-01 WSFT2003181120ST 18-Mar-20 11:20 19-Mar-20 08:41 HDPE Bottle, 250 mL
HDPE Bottle, 250 mL

Vista Project: 2000605 Client Project: MPART - Palo, Ionia County, MI

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ANALYTICAL RESULTS

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										100	
Sample ID: L	RB								EP	A Method 537	Rev 1.1
Client Data					Lab	oratory Data					
Name:	AECOM		Matrix:	Aqueous	Lab	Sample:	B0C0257-	BLK1	Column:	BEH C18	
Project:	MPART - Palo, Ionia Co	unty, MI		•		•				BEIT CTO	
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxA		307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHpA		375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHxS		355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFOA		335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFNA		375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFOS		1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDA		335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
MeFOSAA		2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
EtFOSAA		2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFUnA		2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDoA		307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTrDA		72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTeDA		376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
Labeled Standar	ds	Туре	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	98	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
13C2-PFDA		SURR	93	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
d5-EtFOSAA		SURR	87	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ.

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

Work Order 2000605 Page 6 of 15



Sample ID: LFB

EPA Method 537 Rev 1.1

Client Data Laboratory Data

Name: AECOM Matrix: Aqueous Lab Sample: B0C0257-BS1 Column: BEH C18
Project: MPART - Palo, Ionia County, MI

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	43	35	123	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxA	307-24-4	46	40	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHpA	375-85-9	48	40	121	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxS	355-46-4	42	36	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOA	335-67-1	43	40	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFNA	375-95-1	45	40	114	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOS	1763-23-1	40	37	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDA	335-76-2	42	40	104	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
MeFOSAA	2355-31-9	37	40	93	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
EtFOSAA	2991-50-6	36	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFUnA	2058-94-8	40	40	99	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDoA	307-55-1	37	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTrDA	72629-94-8	36	40	90	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTeDA	376-06-7	35	40	87	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
Labeled Standards		Туре		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR		110	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
13C2-PFDA		SURR		101	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
d5-EtFOSAA		SURR		90	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1

Data Reported per Michigan DEQ instructions.

Work Order 2000605 Page 7 of 15



Sample ID: W	VSFT2003181120ST							EP	A Method 537	Rev 1.1
Client Data	17.001 f				boratory Data	2000000				
Name:	AECOM	Matrix:	Drinking Water		Sample:	2000605-0		Column:	BEH C18	
Project:	MPART - Palo, Ionia County, MI	Date Collected:	18-Mar-20 11:20	Dat	te Received:	19-Mar-20	08:41			
Location:	4560 Division St									
Analyte	CAS Number	Conc. (ng/L)		ŘL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	3		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	105	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
13C2-PFDA	SURR	92	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1
d5-EtFOSAA	SURR	97	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 19:44	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ.

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

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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.

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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-В
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.

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NELAP Accredited Test Methods

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

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

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CHAIN OF CUSTODY

For Laborator	ry Use Only		
Work Order#:	2000605	Temp: 30	3
Storage ID: R	-13, WR-2	Storage Secured:	Yes 🗹 N

Project ID: MPART - Palo, Id	onia County,	, MI	PO#: 60560354.14				Sample	er: Sara	a Thu	rkettle & Kaitlyn Eich (name)	oltz	TAT (check one	Standard: Rush (sur	x 21 days charge may apply) ays 7 days S	pecify:
Invoice to: Name		Compan	у		Addr	ess					City	1	State	Ph#	Fax#
Mike Jury		EGLE			Sagi	naw B	ay Dist	rict Of	fice		Sagina	w	MI	517-242-9578	
Relinquished by (printed name	and signatu	re)	Date		Time		R	eceived	by (printed name and sig	gnature)	. 01	011	Date	Time
Kaitlyn Eicholtz	TO DUME	7	3/8/2020		17:00)		W	Mus	an (LIVIC)	1.7	Willen	K. WHO	3 19/20	03:41
Relinquished by (printed name	and signatu	re)	Date		Time		Re	eceive	l by (printed name and sig	gnature)			Date	Time
SHIP TO: Vista Analytical L 1104 Windfield W El Dorado Hills, C (916) 673-1520 *	/ay CA 95762	'3-0106 —	Method of Shipment: Tracking No.:		Conta	s(es) R	equeste	1/0	15 / St. 8	9) 11/25 10/24 8004, 10/26 125 10/00, 10/20 125 10/00 124		10 10 10 10 10 10 10 10 10 10 10 10 10 1	Political Marie Ma		
Sample ID	Date	Time	Location/Sample Description	O. Company	25	*inem	12/	S. Comp.	Full TA	ST S	18/	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		Comments	8
WSFT2003181120ST	3/18/20	11:20	4560 Division St	2	Р	DW						X			
Special Instructions/Comments:	Send Resu	ults and A	Acknowledgements to: See e	mail fo	r distr	ibution	list.			SEND DCUMENTATION ID RESULTS TO:	Company Address City	525 W. Alle Lansing	egan Street, C		ip: 30242
												: 517-897-18 I: KammerS@	597 @michigan.gov	Fax: <u>517-241-3</u>	571
Container Types: P= HDPE, PJ O = OtherWork Order 2000			Bottle Preserva TZ = Trizma:	tion Ty	pe: T		ulfate,			Matrix Types: AQ = SL = Sludge, SO = Sc	Aqueous, DV oil, WW = Wa	<pre>/ = Drinking W stewater, B = I</pre>	ater, EF = Efflue Blood/Serum, O	ent, PP = Pulp/Paper, S = Other: <u>Page 13</u>	SD = Sediment



Sample Log-In Checklist

Vista Work Orde	er#:	200	0605				ge#_ T	std	of _	-	
Samples Arrival:	Date/Time 3 19/20	085	ાંધા	Initials: WRW		Location: Shelf/Rack:					
Delivered By:	FedEx	JPS	On Trac GLS DF		DHL	Har Delive			Oth	her	
Preservation:	(Ice)	Blu	e Ice		Dry lo	2,000		None		
Temp °C: 3	(uncorrecte	d)		^7	- 1		_			3	
Temp °C: 3	(corrected)	Pı	robe use	d: Y (N)		Therm	omet	ter ID:	TK	3	
						## - 1 S #0 43 =			1		
Shipping Contain	er(s) Intact?	Marian Popul	是交通		mil military			YES	NO	NA	
Shipping Custody								V			
Airbill			718:	3 6147	3			V			
Shipping Docume				Test 1				1/			
Shipping Contain		- The same	ista	Client	Ret	ain	Re	turn	Disp	ose	
Chain of Custody	/ Sample Doci	ument	ation Pre	sent?			- 1	1	5.05		
Chain of Custody								V			
Holding Time Acc			attori o o	inpicto;			1	V			
Logged In:	03 19 20	1331		Initials:		ocation		R-13, d-1,	¥		
COC Anomaly/Sa	mnle Accenter	noo Fo		1-4-10		-				_	

Comments:

ID.: LR - SLC

Rev No.: 5

Rev Date: 01/21/2020

Page: 1 of 1

CoC/Label Reconciliation Report WO# 2000605

LabNumber CoC Sample ID		SampleAlias	Sample Date/Time	Container	Sample BaseMatrix Comments	
2000605-01 A WSFT2003181120ST	Ø	4560 Division St	18-Mar-20 11 20 🗹	HDPE Bottle, 250 mL	Aqueous	
2000605-01 B WSFT2003181120ST	<u>v</u>	4560 Division St	18-Mar-20 11:20	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	Comments:
Sample Container Intact?	1			
Sample Custody Seals Intact?			1	
Adequate Sample Volume?	1			
Container Type Appropriate for Analysis(es)	V			
Preservation Documented: Na2S2O3 Trizma None Other	√			
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	1			
		_	+	-

Verifed by/Date: WWS 03/19/20

Printed: 3/19/2020 1:36:38PM



April 09, 2020

Vista Work Order No. 2000604

Mr. Dorin Bogdan AECOM 3950 Sparks Drive SE Grand Rapids, MI 49546

Dear Mr. Bogdan,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 19, 2020 under your Project Name 'MPART - Palo, Ionia County, MI'.

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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

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Vista Work Order No. 2000604 Case Narrative

Sample Condition on Receipt:

One drinking water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

EPA Method 537, Rev. 1.1

The sample was extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

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

A Laboratory Fortified Blank (LFB) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB recoveries were within the method acceptance criteria.

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

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Sample Receipt	13

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2000604-01	WT2003181250ST	18-Mar-20 12:50	19-Mar-20 08:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 2000604 Client Project: MPART - Palo, Ionia County, MI

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ANALYTICAL RESULTS

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Sample ID: LI	RB							EP	A Method 537 l	Rev 1.1
Client Data				Lab	oratory Data					
Name:	AECOM	Matrix:	Aqueous	Lab	Sample:	B0C0257-	BLK1	Column:	BEH C18	
Project:	MPART - Palo, Ionia County, MI		-		-				2211 010	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
Labeled Standard	ds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
13C2-PFDA	SURR	93	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
d5-EtFOSAA	SURR	87	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1

RL - Reporting limit

Results reported to RL.
Reporting convention specified by MI DEQ.

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

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Sample ID: LFB

EPA Method 537 Rev 1.1

Client Data Laboratory Data

Name: AECOM Matrix: Aqueous Lab Sample: B0C0257-BS1 Column: BEH C18
Project: MPART - Palo, Ionia County, MI

CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
375-73-5	43	35	123	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
307-24-4	46	40	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
375-85-9	48	40	121	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
355-46-4	42	36	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
335-67-1	43	40	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
375-95-1	45	40	114	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
1763-23-1	40	37	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
335-76-2	42	40	104	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
2355-31-9	37	40	93	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
2991-50-6	36	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
2058-94-8	40	40	99	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
307-55-1	37	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
72629-94-8	36	40	90	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
376-06-7	35	40	87	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
	Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
	SURR		110	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
	SURR		101	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
	SURR		90	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
	375-73-5 307-24-4 375-85-9 355-46-4 335-67-1 375-95-1 1763-23-1 335-76-2 2355-31-9 2991-50-6 2058-94-8 307-55-1 72629-94-8	375-73-5 43 307-24-4 46 375-85-9 48 355-46-4 42 335-67-1 43 375-95-1 45 1763-23-1 40 335-76-2 42 2355-31-9 37 2991-50-6 36 2058-94-8 40 307-55-1 37 72629-94-8 36 376-06-7 35 Type SURR SURR	375-73-5	375-73-5 43 35 123 307-24-4 46 40 116 375-85-9 48 40 121 355-46-4 42 36 116 335-67-1 43 40 108 375-95-1 45 40 114 1763-23-1 40 37 108 335-76-2 42 40 104 2355-31-9 37 40 93 2991-50-6 36 40 91 2058-94-8 40 40 99 307-55-1 37 40 91 72629-94-8 36 40 90 376-06-7 35 40 87 Type % Rec SURR 110 SURR 110	375-73-5 43 35 123 70 - 130 307-24-4 46 40 116 70 - 130 375-85-9 48 40 121 70 - 130 355-46-4 42 36 116 70 - 130 335-67-1 43 40 108 70 - 130 375-95-1 45 40 114 70 - 130 335-76-2 42 40 104 70 - 130 2355-31-9 37 40 93 70 - 130 2991-50-6 36 40 91 70 - 130 2058-94-8 40 40 99 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 90 70 - 130 307-55-1 37 40 90 70 - 130 307-55-1 37 40 91 70 - 130	375-73-5	375-73-5 43 35 123 70 - 130 B0C0257 307-24-4 466 40 116 70 - 130 B0C0257 375-85-9 48 40 121 70 - 130 B0C0257 335-46-4 42 36 116 70 - 130 B0C0257 335-67-1 43 40 108 70 - 130 B0C0257 375-95-1 45 40 114 70 - 130 B0C0257 1763-23-1 40 37 108 70 - 130 B0C0257 335-76-2 42 40 104 70 - 130 B0C0257 2355-31-9 37 40 93 70 - 130 B0C0257 2991-50-6 36 40 91 70 - 130 B0C0257 2058-94-8 40 40 99 70 - 130 B0C0257 307-55-1 37 40 91 70 - 130 B0C0257 72629-94-8 36 40 90 70 - 130 B0C0257 72629-94-8 36 40 90 70 - 130 B0C0257 376-06-7 35 40 87 70 - 130 B0C0257 376-06-7 35 40 87 70 - 130 B0C0257 376-06-7 35 40 87 70 - 130 B0C0257 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-	375-73-5	375-73-5	375-73-5

Data Reported per Michigan DEQ instructions.

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Sample ID: WT2003181250ST EPA Method 537 Rev 1.1										
Client Data Name:	AECOM	Matrix:	Drinking Water		boratory Data Sample:	2000604-0	11	G-1	DEIL G10	
Project: Location:	MPART - Palo, Ionia County, MI 8406 Main St	Date Collected:	18-Mar-20 12:50		te Received:	19-Mar-20		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	81	70 - 130			B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
13C2-PFDA	SURR	100	70 - 130			B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1
d5-EtFOSAA	SURR	85	70 - 130			B0C0257	31-Mar-20	0.24 L	07-Apr-20 16:05	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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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.

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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-В
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.

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NELAP Accredited Test Methods

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

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

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MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B
Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue	EPA 1668A/C
by GC/HRMS	
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	EPA 8280A/B
Dibenzofurans by GC/HRMS	
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	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	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

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o = Othework Order 2000604_

CHAIN OF CUSTODY

TZ = Trizma: TZ

For Laboratory Use Only		
Work Order #: 2000604	Temp: 3.3	3
Storage ID: R-13, WR-2	Storage Secured:	Yes 🗹 I

SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: Page 13 of 15

Invoice to: Name Company Address Mike Jury EGLE Saginaw Bay District Office Relinquished by (printed name and signature) Date Time Received by (printed name Kaitlyn Eicholtz 3/8/2020 17:00	ne and signature) Note: The state of the st	# Fax# 7-242-9578 Date Time Date Time
Relinquished by (printed name and signature) Date Time Received by (printed name	ne and signature) Note that the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature in the signature is a signature in the signature is	Date Time
	Sout Whatlust 3	19/20 09:41
Kaitlyn Eicholtz Hallin July July 3/8/2020 17:00 Will Ham R)	ne and signature)	1
	e and signature)	Date Time
Relinquished by (printed name and signature) Date Time Received by (printed name		
SHIP TO: Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 (916) 673-1520 * Fax (916) 673-0106 Method of Shipment: Container(s)	25 60 60 60 60 60 60 60 60 60 60 60 60 60	
ATTN: Tracking No.:	8-9-0-9-0-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	
Sample ID Date Time Location/Sample Description		Comments
WT2003181250ST 3/18/20 12:50 8406 Main St 2 P DW	x	
Special Instructions/Comments: Send Results and Acknowledgements to: See email for distribution list. Send Results and Acknowledgements to: See email for distribution list. AND RESUL	201 T. S. T. T. T. S.	ution Hall 1st South Wes
AND RESUL	City: Lansing State	



Sample Log-In Checklist

Vista Work Orde	er#:	200	W60H				# <u> </u>	of	
Samples Arrival:	Date/Time		ill	Initials: WRW		Location		VA	
Delivered By:	FedEx	UPS	On Tra	c GLS	DHL		and ivered	Ot	her
Preservation:	(Ice		Blu	ie Ice		Dry Ice		No	ne
Temp °C: 3	(uncorrec	ted)		()				1.0	7
Temp °C: 33	corrected	d)	robe use	ed: Y (N)		Thermor	neter ID:	TK	5
	pin of the state o				71 - in - 41 - 41 - 41 - 41 - 41 - 41 - 41 - 4		YES	NO	NA
Shipping Contain	er(s) Intact?			110	2-11-11		V		IVA
Shipping Custody	/ Seals Intac	t?					V		
Airbill	Trk#	1704	1718	3 614	3		V		
Shipping Docume	entation Pres	ent?			di-		1/		
Shipping Contain	er	(V	ista	Client	Reta	ain	Return	Disr	ose
Chain of Custody	/ Sample Do	cument	ation Pre	esent?			1		
Chain of Custody							Î		
Holding Time Acc				p.roto.			V		
Logged In:	Date/Time 03 19 20	1321		Initials:		ocation	: R-13,	*	
COC Anomaly/Sa	mple Accept	ance Fo	rm comp	lotod2				1	

Comments:

ID.: LR - SLC

Rev No.: 5

Rev Date: 01/21/2020

Page: 1 of 1

CoC/Label Reconciliation Report WO# 2000604

LabNumber CoC Sample ID		SampleAlias	Sample Date/Time	Container	Sample BaseMatrix Comments
2000604-01 A WT2003181250ST		8406 Main St	18-Mar-20 12:50 🗹	HDPE Bottle, 250 mL	Aqueous
2000604-01 B WT2003181250ST	☑	8406 Main St	18-Mar-20 12:50	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	Comments:
Sample Container Intact?	1			
Sample Custody Seals Intact?			1	
Adequate Sample Volume?	1			
Container Type Appropriate for Analysis(es)	V			
Preservation Documented: Na2S2O3 Trizma None Other	V			
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	1			
		_		4

Verifed by/Date: WUS 03 19 20

Printed: 3/19/2020 1:29:57PM



April 09, 2020

Vista Work Order No. 2000603

Mr. Dorin Bogdan AECOM 3950 Sparks Drive SE Grand Rapids, MI 49546

Dear Mr. Bogdan,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 19, 2020 under your Project Name 'MPART - Palo, Ionia County, MI'.

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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

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Vista Work Order No. 2000603 Case Narrative

Sample Condition on Receipt:

One drinking water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

EPA Method 537, Rev. 1.1

The sample was extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

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

A Laboratory Fortified Blank (LFB) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB recoveries were within the method acceptance criteria.

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

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Case Narrative	1
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Certifications	10
Sample Receipt	13

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2000603-01	WT2003181340ST	18-Mar-20 13:40	19-Mar-20 08:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 2000603 Client Project: MPART - Palo, Ionia County, MI

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ANALYTICAL RESULTS

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Sample ID: LRB								EP	A Method 537	Rev 1.1
Client Data				Lab	oratory Data					
Name: A	ECOM	Matrix:	Aqueous	Lab	Sample:	B0C0257-	BLK1	Column:	BEH C18	
Project: M	MPART - Palo, Ionia County, MI				-				2211 010	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
Labeled Standards	Туре	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
13C2-PFDA	SURR	93	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
d5-EtFOSAA	SURR	87	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ.

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

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Sample ID: LFB

EPA Method 537 Rev 1.1

Client Data Laboratory Data

Name: AECOM Matrix: Aqueous Lab Sample: B0C0257-BS1 Column: BEH C18
Project: MPART - Palo, Ionia County, MI

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	43	35	123	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxA	307-24-4	46	40	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHpA	375-85-9	48	40	121	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxS	355-46-4	42	36	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOA	335-67-1	43	40	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFNA	375-95-1	45	40	114	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOS	1763-23-1	40	37	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDA	335-76-2	42	40	104	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
MeFOSAA	2355-31-9	37	40	93	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
EtFOSAA	2991-50-6	36	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFUnA	2058-94-8	40	40	99	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDoA	307-55-1	37	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTrDA	72629-94-8	36	40	90	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTeDA	376-06-7	35	40	87	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
Labeled Standards		Туре		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR		110	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
13C2-PFDA		SURR		101	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
d5-EtFOSAA		SURR		90	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1

Data Reported per Michigan DEQ instructions.

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Sample ID: WT2003181340ST EPA Method 537 Rev 1.1										
Client Data Name: Project:	AECOM MPART - Palo, Ionia County, MI	Matrix: Date Collected:	Drinking Water 18-Mar-20 13:40	Lab	ooratory Data Sample: e Received:	2000603-0 19-Mar-20		Column:	BEH C18	
Location:	8267 Church St									
Analyte	CAS Number	Conc. (ng/L)		ŘL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	100	70 - 130			B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1
13C2-PFDA	SURR	91	70 - 130			B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1
d5-EtFOSAA	SURR	83	70 - 130			B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:59	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

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

Work Order 2000603 Page 8 of 15

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.

Work Order 2000603 Page 9 of 15

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-В
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.

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NELAP Accredited Test Methods

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

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

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O = OtheWork Order 2000603_

CHAIN OF CUSTODY

TZ = Trizma: TZ

For Laboratory Use Only		
Work Order #: 2000603	Temp: 303	
Storage ID: R-13, WR-2	Storage Secured:	Yes 🗖 N

SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: Page 13 of 15

Project ID: MPART - Palo,	onia County	MI	PO#: 60560354.14	r e			Sampl	er: Sai	ra Thur	kettle & Kaitlyn Eich (name)	oltz		TAT (check one)	Standard: Rush (sur	charge may apply)	Specify:
Invoice to: Name		Compan	ıy		Addr	ess					City			State	Ph#	Fax#
Mike Jury		EGLE			Sagi	naw E	ay Dis	trict O	ffice		Sag	inaw		MI	517-242-9578	
Relinquished by (printed nam	e and signatu	re)	Date		Time		R	eceive	d by (p	printed name and si	nature)		01 (111	Date	Time
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Relinquished by (printed nam	e and signatu	re)	Date		Time	1	R	eceive	d by (p	printed name and sig	gnature)				Date	Time
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Special Instructions/Comments:	Send Res	ults and A	Acknowledgements to:							SEND		_	Stephanie k	Cammer		
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							-		AN	D RESULTS TO:		-	ansing	gan Street, C	State: MI Z	st South We Zip: 30242
													17-897-159	7	Fax: 517-241-3	
					_							200		michigan.gov		1



Sample Log-In Checklist

Vista Work Orde	er#:2(W0603				#	of _	
Samples Arrival:	Date/Time 3 19/20 0	8:41	Initials: WRW		Location		W/A	
Delivered By:	FedEx UPS	On Tra	c GLS	DHL		land livered	Ot	her
Preservation:	(Ice	Blu	ie Ice		Dry Ice		No	ne
Temp °C: 3.	5 (corrected)		ed: Y (N)		Thermo	meter ID	IR-	3
	A CONTRACTOR OF THE STATE OF TH					YES	NO	NA
Shipping Contain	er(s) Intact?					V	1	
Shipping Custody	/ Seals Intact?					V		
Airbill	Trk# 170	X 718	3 614	3		V		
Shipping Docume	entation Present?)				1/	1	
Shipping Contain	er (Vista)	Client	Ret	ain	Return	Disp	ose
Chain of Custody	/ Sample Docume	entation Pre	esent?			0		
	/ Sample Docume					V		
Holding Time Acc		- T	12,72.25.8			V		
Logged In:	Date/Time 03 19 20 1315		Initials:		ocation	1: R-13	WR-2 \$ E-4	
COC Anomaly/Sa	mple Acceptance	Form comp	oleted?				/	/

Comments:

ID.: LR - SLC

Rev No.: 5

Rev Date: 01/21/2020

Page: 1 of 1

CoC/Label Reconciliation Report WO# 2000603

LabNumber CoC Sample ID		SampleAlias	Sample Date/Time	Container	Sample BaseMatrix Comments
2000603-01 A WT2003181340ST	ď	8267 Church St	18-Mar-20 13:40 🗹	HDPE Bottle, 250 mL	Aqueous
2000603-01 B WT2003181340ST	Ú	8267 Church St	18-Mar-20 13:40	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	Comments:
Sample Container Intact?	V			
Sample Custody Seals Intact?			V	
Adequate Sample Volume?	1			Ī
Container Type Appropriate for Analysis(es)	1			
Preservation Documented: Na2S2O3 Trizma None Other	1	- 4		
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	1			

Verifed by/Date: WWS 08/19/20

Printed: 3/19/2020 1:19:44PM



April 09, 2020

Vista Work Order No. 2000602

Mr. Dorin Bogdan AECOM 3950 Sparks Drive SE Grand Rapids, MI 49546

Dear Mr. Bogdan,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 19, 2020 under your Project Name 'MPART - Palo, Ionia County, MI'.

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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

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Vista Work Order No. 2000602 Case Narrative

Sample Condition on Receipt:

One drinking water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

EPA Method 537, Rev. 1.1

The sample was extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

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

A Laboratory Fortified Blank (LFB) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB recoveries were within the method acceptance criteria.

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

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Case Narrative	1
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Sample Inventory	4
Analytical Results	5
Qualifiers	9
Certifications	10
Sample Receipt	13

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2000602-01	WT2003181350ST	18-Mar-20 13:50	19-Mar-20 08:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 2000602 Client Project: MPART - Palo, Ionia County, MI

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ANALYTICAL RESULTS

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Sample ID: LR	В							EP.	A Method 537 l	Rev 1.1
Client Data				La	aboratory Data					
Name:	AECOM	Matrix:	Aqueous	La	b Sample:	B0C0257-	BLK1	Column:	BEH C18	
Project:	MPART - Palo, Ionia County, MI		•						DEIT 010	
Analyte	CAS Numbe	er Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTrDA	72629-94-8	ND ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
Labeled Standards	s Type	% Recovery	I	imits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98	7	0 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
13C2-PFDA	SURR	93		0 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
d5-EtFOSAA	SURR	87	7	0 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	

RL - Reporting limit

Results reported to RL.
Reporting convention specified by MI DEQ.

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

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Sample ID: LFB

EPA Method 537 Rev 1.1

Client Data Laboratory Data

Name: AECOM Matrix: Aqueous Lab Sample: B0C0257-BS1 Column: BEH C18
Project: MPART - Palo, Ionia County, MI

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	43	35	123	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxA	307-24-4	46	40	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHpA	375-85-9	48	40	121	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxS	355-46-4	42	36	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOA	335-67-1	43	40	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFNA	375-95-1	45	40	114	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOS	1763-23-1	40	37	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDA	335-76-2	42	40	104	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
MeFOSAA	2355-31-9	37	40	93	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
EtFOSAA	2991-50-6	36	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFUnA	2058-94-8	40	40	99	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDoA	307-55-1	37	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTrDA	72629-94-8	36	40	90	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTeDA	376-06-7	35	40	87	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
Labeled Standards		Туре		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR		110	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
13C2-PFDA		SURR		101	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
d5-EtFOSAA		SURR		90	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1

Data Reported per Michigan DEQ instructions.

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Sample ID: WT2003181350ST EPA Method 537 Rev 1.1										
Client Data Name:	AECOM	Matrix:	Drinking Water		boratory Data	2000602-0	11	6.1	DELL 640	
		Date Collected:	18-Mar-20 13:50		Sample: te Received:	19-Mar-20 08:41		Column:	BEH C18	
Project: Location:	MPART - Palo, Ionia County, MI 8335 Church St	Date Conceted.	18-Mar-20 13:30	Dai	te Received:	19-Mar-20 08:41				
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
Labeled Standar	ds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	104	70 - 130			B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
13C2-PFDA	SURR	93	70 - 130			B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1
d5-EtFOSAA	SURR	80	70 - 130			B0C0257	31-Mar-20	0.24 L	06-Apr-20 18:48	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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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.

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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-В
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.

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NELAP Accredited Test Methods

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

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

Work Order 2000602 Page 12 of 15



o = OtheWork Order 2000602_

CHAIN OF CUSTODY

TZ = Trizma: TZ

For Laborator	ry Use Only		
Work Order #:	2000602	Temp: 3.3	
Storage ID: 12-	-13, WR-2	Storage Secured:	Yes 🗹 N

SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: $_{-Page\ 13\ of\ 15}$

	ia County,	MI	PO#: 60560354.14				Sampl	er: <u>Sar</u>	a Thui	kettle & Kaitlyn Eich	oltz	(check	Standard: one): Rush (sur 14 da	charge may apply)	necify:
Invoice to: Name		Company	у		Addr	ess		_			City		State	Ph#	Fax#
Mike Jury		EGLE			Sagi	naw B	ay Dis	trict O	ffice		Sagina	w	MI	517-242-9578	
Relinquished by (printed name a	nd signatur	e)	Date		Time		R	eceive	d by (printed name and sig	nature)	11	4.11	Date	Time
Kaitlyn Eicholtz	Supoth)	3/8/2020		17:00)	1	J.1	lua	n Ringaht	- 4	سالد	KUW	3/19/20	08:41
Relinquished by (printed name a	nd signatur	re)	Date		Time		R	eceive	d by (printed name and sig	ınature)		.0	Date	Time
SHIP TO: Vista Analytical Lab 1104 Windfield Way El Dorado Hills, CA (916) 673-1520 * Fa	95762	3-0106	Method of Shipment: Tracking No.:			s(es) R		/	1,051.0	Mono Esq.	\$ /	\$\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_{\gamma_	100 mm/0/256		
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WT2003181350ST	3/18/20	13:50	8335 Church St	2	Р	DW						х			
													NO procedes		
Special Instructions/Comments:	sena Kesu	iits and A	Acknowledgements to: See e	mail fo	r distr	ibution	list.			SEND CUMENTATION D RESULTS TO:	Compan	y: EGLE	nie Kammer Allegan Street, C	Constitution Hall, 1s	st South Wes
									231		Cit Phon	y: Lansing e: 517-897		State: MI Z Fax: 517-241-35	ip: 30242



Sample Log-In Checklist

Vista Work Ordo	er#:200	0602				ge #	std	of	_
Samples Arrival:	Date/Time 3 19/20	. કૃત્ત	Initials:)	Locat		(:/	N/A	
Delivered By:	FedEx UPS	On Tra	ac GLS	DHL		Han		Ot	her
Preservation:	(Ice	Blu	ue Ice		Dry I			No	ne
Temp °C: 3.3		Probe use	ed: Y (N)		Therm	ome	ter ID:	IR-	3
Shipping Contain	or(s) Into et?	A THE CONTRACTOR AND THE SECOND SECON		00 00 00 00 00 00 00 00 00 00 00 00 00		-8, 345 -4, 444	YES	NO	NA
Shipping Custody							V	1	-
Airbill	Trk # 17	09 718	3 614	3			V		
Shipping Docume	entation Present?	-	2 41 (1			1/		
Shipping Contain	er	(Vista)	Client	Ref	tain	Re	turn	Disp	ose
Chain of Custody	/ Sample Docum	entation Pre	esent?				0		
Chain of Custody	/ Sample Docum	entation Co	mplete?				V		
Holding Time Acc						T	V		
Logged In:	Date/Time 03 19 20 130	q	Initials:		Location		V	WR-2 \$ E-4	
COC Anomaly/Sa	mple Acceptance	Form comp	leted?					1	-

Comments:

ID.: LR - SLC

Rev No.: 5

Rev Date: 01/21/2020

Page: 1 of 1

CoC/Label Reconciliation Report WO# 2000602

LabNumber CoC Sample ID	Number CoC Sample ID		Sample Date/Time	Container	Sample BaseMatrix Comments
2000602-01 A WT2003181350ST	Ø	8335 Church St	18-Mar-20 13:50 🔻	HDPE Bottle, 250 mL	Aqueous
2000602-01 B WT2003181350ST	☑	8335 Church St	18-Mar-20 13:50 🗹	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	Comments:
Sample Container Intact?	V	-11		
Sample Custody Seals Intact?			1	
Adequate Sample Volume?	1			
Container Type Appropriate for Analysis(es)	1			
Preservation Documented: Na2S2O3 Trizma None Other	1			
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	1			

Verifed by/Date: WWS 03 19 20

Printed: 3/19/2020 1:14:36PM

Page 1 of 1

2000602



April 09, 2020

Vista Work Order No. 2000601

Mr. Dorin Bogdan AECOM 3950 Sparks Drive SE Grand Rapids, MI 49546

Dear Mr. Bogdan,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 19, 2020 under your Project Name 'MPART - Palo, Ionia County, MI'.

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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Work Order 2000601 Page 1 of 15

Vista Work Order No. 2000601 Case Narrative

Sample Condition on Receipt:

One drinking water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

EPA Method 537, Rev. 1.1

The sample was extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

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

A Laboratory Fortified Blank (LFB) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB recoveries were within the method acceptance criteria.

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

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Case Narrative	1
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Analytical Results	5
Qualifiers	9
Certifications	10
Sample Receipt	13

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers			
2000601-01	WT2003181400ST	18-Mar-20 14:00	19-Mar-20 08:41	HDPE Bottle, 250 mL			
				HDPE Bottle, 250 mL			

Vista Project: 2000601 Client Project: MPART - Palo, Ionia County, MI

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ANALYTICAL RESULTS

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Sample ID: 1	LRB								EP	A Method 537	Rev 1.1
Client Data					Lab	oratory Data					
Name:	AECOM		Matrix:	Aqueous	Lab	Sample:	B0C0257-	BLK1	Column:	BEH C18	
Project:	MPART - Palo, Ionia	County, MI		-		-				2211 010	
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxA		307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHpA		375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxS		355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOA		335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFNA		375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOS		1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDA		335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
MeFOSAA		2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
EtFOSAA		2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFUnA		2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDoA		307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTrDA		72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTeDA		376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
Labeled Standa	ards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	98	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
13C2-PFDA		SURR	93	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1

70 - 130

RL - Reporting limit

SURR

d5-EtFOSAA

Results reported to RL.

87

Reporting convention specified by MI DEQ.

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

0.25 L

06-Apr-20 17:08

B0C0257 31-Mar-20

Work Order 2000601 Page 6 of 15



Sample ID: LFB

EPA Method 537 Rev 1.1

Client Data Laboratory Data

Name: AECOM Matrix: Aqueous Lab Sample: B0C0257-BS1 Column: BEH C18
Project: MPART - Palo, Ionia County, MI

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	43	35	123	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxA	307-24-4	46	40	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHpA	375-85-9	48	40	121	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxS	355-46-4	42	36	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOA	335-67-1	43	40	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFNA	375-95-1	45	40	114	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOS	1763-23-1	40	37	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDA	335-76-2	42	40	104	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
MeFOSAA	2355-31-9	37	40	93	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
EtFOSAA	2991-50-6	36	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFUnA	2058-94-8	40	40	99	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDoA	307-55-1	37	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTrDA	72629-94-8	36	40	90	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTeDA	376-06-7	35	40	87	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
Labeled Standards		Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR		110	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
13C2-PFDA		SURR		101	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
d5-EtFOSAA		SURR		90	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1

Data Reported per Michigan DEQ instructions.

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Sample ID: V	Sample ID: WT2003181400ST EPA Method 537 Rev 1.1													
Client Data				Lab	boratory Data									
Name:	AECOM	Matrix:	Drinking Water	Lab	Sample:	2000601-0	1	Column:	BEH C18					
Project:	MPART - Palo, Ionia County, MI	Date Collected:	18-Mar-20 14:00	Dat	te Received:	19-Mar-20	08:41							
Location:	8262 Front St													
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution				
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution				
13C2-PFHxA	SURR	108	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
13C2-PFDA	SURR	101	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				
d5-EtFOSAA	SURR	87	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:37	1				

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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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.

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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-В
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.

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NELAP Accredited Test Methods

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

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

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O = Othework Order 2000601

CHAIN OF CUSTODY

TZ = Trizma: TZ

For Laboratory Use Only		
Work Order #: 20060	Temp: 3.3	
Storage ID: R-13 WR-2	Storage Secured:	Yes 🗹 N

SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: Page 13 of 15

onia County,	MI	PO#: 60560354.14	1			Sample	er: Sar	a Thui	rkettle & Kaitlyn Eich (name)	oltz		TAT (check one)	Rush (sur	rcharge may apply)	pecify:
	Compan	у		Addr	ess					City			State	Ph#	Fax#
	EGLE			Sagi	naw B	ay Dis	rict O	fice		Sag	inaw		MI	517-242-9578	
e and signatu	re)	Date		Time		R	eceive	by (printed name and sig	gnature)		10	01	Date	Time
Hir Sutply)	3/8/2020		17:00	1		9	W	Musur R.W	son hit		Will	· AN	3/19/20	09:41
e and signatu	re)	Date		Time		R	eceive	by (printed name and sig	gnature)			-	Date	Time
Vay CA 95762	3-0106	Method of Shipment: Tracking No.:		Conta	iner(s)	/	2000			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	97.55 55 56 56 56 56 56 56	The Market of the Control of the Con		
Date	Time	Location/Sample Description	1	The day	Timen.	18/	S 8	Full.	Sanch List	12	3/3	128		Comment	ts
3/18/20	14:00	8262 Front St	2	Р	DW							х			
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Send Res	ults and A		mail fo	r distr	ibutior	ı list.				Comp	oany: I	EGLE 525 W. Alleg			st South Wes
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Sample Log-In Checklist

Vista Work Ord	er#:200	0601			Page #	: <u>1</u> std	of 1	
Samples Arrival:	Date/Time 3 19/20 0	8 ⁶ ન્ના	Initials:)	ocation:		U/A	
Delivered By:	FedEx UPS	On Tra	ac GLS	DHL	Hai Deliv	10.00	Ot	her
Preservation:	(Ice	Bli	ue Ice		Dry Ice	orou	No	ne
Temp °C: 3		Probe use	ed: Y (N)	Т	hermom	eter ID:	IR-	3
		To state of the administration of the state		San Aller		YES	NO	NA
Shipping Contain	ner(s) Intact?					V		
Shipping Custod	y Seals Intact?					V		
Airbill	Trk# 170	X8 718	3 614	3		V		
Shipping Docume	entation Present?					V		
Shipping Contain	er (Vista	Client	Retai	n R	eturn	Disp	ose
Chain of Custody	/ Sample Docume	ntation Pre	esent?			1		
	/ Sample Docume					V		
Holding Time Acc						V		
Logged In:	Date/Time 03 19 20 1302		Initials:		ocation: nelf/Rack	R-13,	¥	
COC Anomaly/Sa	mple Acceptance I	Form comm	loto dO				1	

Comments:

ID.: LR - SLC

Rev No.: 5

Rev Date: 01/21/2020

Page: 1 of 1

CoC/Label Reconciliation Report WO# 2000601

LabNumber CoC Sample ID		SampleAlias	Sample Date/Time	Container	Sample BaseMatrix Comments
2000601-01 A WT2003181400ST	✓	8262 Front St	18-Mar-20 14:00 🗹	HDPE Bottle, 250 mL	Aqueous
2000601-01 B WT2003181400ST	☑	8262 Front St	18-Mar-20 14:00	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	Comments
Sample Container Intact?	1			
Sample Custody Seals Intact?			1	Ī
Adequate Sample Volume?	1			
Container Type Appropriate for Analysis(es)	1			
Preservation Documented: Na2S2O3 Trizma None Other	1			
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	1			
	_		_	•

Verifed by/Date: WWS 03 19 20

Printed: 3/19/2020 1:08:00PM



April 14, 2020

Vista Work Order No. 2000600

Mr. Dorin Bogdan AECOM 3950 Sparks Drive SE Grand Rapids, MI 49546

Dear Mr. Bogdan,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 19, 2020 under your Project Name 'MPART - Palo, Ionia County, MI'.

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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Work Order 2000600 Page 1 of 15

Vista Work Order No. 2000600 Case Narrative

Sample Condition on Receipt:

One drinking water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

EPA Method 537, Rev. 1.1

The sample was extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

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

A Laboratory Fortified Blank (LFB) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB recoveries were within the method acceptance criteria.

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

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Case Narrative	1
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Analytical Results	5
Qualifiers	9
Certifications	10
Sample Receipt	13

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2000600-01	WR2003181420ST	18-Mar-20 14:20	19-Mar-20 08:41	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 2000600 Client Project: MPART - Palo, Ionia County, MI

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ANALYTICAL RESULTS

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Sample ID: LRB								EP	A Method 537	Rev 1.1
Client Data				Lab	oratory Data					
Name: A	ECOM	Matrix:	Aqueous	Lab	Sample:	B0C0257-	BLK1	Column:	BEH C18	
Project: M	MPART - Palo, Ionia County, MI				-				2211 010	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
Labeled Standards	Туре	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
13C2-PFDA	SURR	93	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
d5-EtFOSAA	SURR	87	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	

RL - Reporting limit

Results reported to RL.
Reporting convention specified by MI DEQ.

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

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Sample ID: LFB

EPA Method 537 Rev 1.1

Client Data Laboratory Data

Name: AECOM Matrix: Aqueous Lab Sample: B0C0257-BS1 Column: BEH C18
Project: MPART - Palo, Ionia County, MI

CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
375-73-5	43	35	123	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
307-24-4	46	40	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
375-85-9	48	40	121	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
355-46-4	42	36	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
335-67-1	43	40	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
375-95-1	45	40	114	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
1763-23-1	40	37	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
335-76-2	42	40	104	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
2355-31-9	37	40	93	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
2991-50-6	36	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
2058-94-8	40	40	99	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
307-55-1	37	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
72629-94-8	36	40	90	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
376-06-7	35	40	87	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
	Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
	SURR		110	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
	SURR		101	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
	SURR		90	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
	375-73-5 307-24-4 375-85-9 355-46-4 335-67-1 375-95-1 1763-23-1 335-76-2 2355-31-9 2991-50-6 2058-94-8 307-55-1 72629-94-8	375-73-5 43 307-24-4 46 375-85-9 48 355-46-4 42 335-67-1 43 375-95-1 45 1763-23-1 40 335-76-2 42 2355-31-9 37 2991-50-6 36 2058-94-8 40 307-55-1 37 72629-94-8 36 376-06-7 35 Type SURR SURR	375-73-5	375-73-5 43 35 123 307-24-4 46 40 116 375-85-9 48 40 121 355-46-4 42 36 116 335-67-1 43 40 108 375-95-1 45 40 114 1763-23-1 40 37 108 335-76-2 42 40 104 2355-31-9 37 40 93 2991-50-6 36 40 91 2058-94-8 40 40 99 307-55-1 37 40 91 72629-94-8 36 40 90 376-06-7 35 40 87 Type % Rec SURR 110 SURR 110	375-73-5 43 35 123 70 - 130 307-24-4 46 40 116 70 - 130 375-85-9 48 40 121 70 - 130 355-46-4 42 36 116 70 - 130 335-67-1 43 40 108 70 - 130 375-95-1 45 40 114 70 - 130 335-76-2 42 40 104 70 - 130 2355-31-9 37 40 93 70 - 130 2991-50-6 36 40 91 70 - 130 2058-94-8 40 40 99 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130 307-55-1 37 40 91 70 - 130	375-73-5	375-73-5 43 35 123 70 - 130 B0C0257 307-24-4 466 40 116 70 - 130 B0C0257 375-85-9 48 40 121 70 - 130 B0C0257 335-46-4 42 36 116 70 - 130 B0C0257 335-67-1 43 40 108 70 - 130 B0C0257 375-95-1 45 40 114 70 - 130 B0C0257 1763-23-1 40 37 108 70 - 130 B0C0257 335-76-2 42 40 104 70 - 130 B0C0257 2355-31-9 37 40 93 70 - 130 B0C0257 2991-50-6 36 40 91 70 - 130 B0C0257 2058-94-8 40 40 99 70 - 130 B0C0257 307-55-1 37 40 91 70 - 130 B0C0257 72629-94-8 36 40 90 70 - 130 B0C0257 72629-94-8 36 40 90 70 - 130 B0C0257 376-06-7 35 40 87 70 - 130 B0C0257 376-06-7 35 40 87 70 - 130 B0C0257 376-06-7 35 40 87 70 - 130 B0C0257 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-7 300-05-	375-73-5	375-73-5	375-73-5

Data Reported per Michigan DEQ instructions.

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Sample ID: V	VR2003181420ST							EP	A Method 537	Rev 1.1
Client Data				Lab	boratory Data					
Name:	AECOM	Matrix:	Drinking Water	Lab	Sample:	2000600-0)1	Column:	BEH C18	
Project:	MPART - Palo, Ionia County, MI	Date Collected:	18-Mar-20 14:20	Dat	te Received:	19-Mar-20	08:41		2211 010	
Location:	8456 Church St									
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	10		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	1
PFHxA	307-24-4	13		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	1
PFHpA	375-85-9	8		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	1
PFHxS	355-46-4	7		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	1
PFOA	335-67-1	26		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	1
PFNA	375-95-1	3		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	1
PFOS	1763-23-1	58		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	109	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	1
13C2-PFDA	SURR	99	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	1
d5-EtFOSAA	SURR	94	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:26	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

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

Work Order 2000600 Page 8 of 15

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.

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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-В
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.

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NELAP Accredited Test Methods

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

MATRIX: Biological Tissue	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B
Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue	EPA 1668A/C
by GC/HRMS	
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by	EPA 1699
HRGC/HRMS	
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by	EPA 8280A/B
GC/HRMS	
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	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	EPA 1613B
Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue	EPA 1668A/C
by GC/HRMS	
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
P' ' I GGWPMG	ED 4 (12
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated	EPA 8280A/B
Dibenzofurans by GC/HRMS	LITTOZOOTUB
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	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	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

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O = OtherWork Order 2000600

CHAIN OF CUSTODY

TZ = Trizma: TZ

For Laboratory Use Only Work Order #: 200600	Temp: 3,3					
Storage ID: R-13, WR-2	Storage Secured:	Yes ☑ N				

SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: Page 13 of 15

Project ID: MPART - Palo,	Ionia County	MI	PO#: 60560354.14	<u> </u>			Sam	npler:	Sara	Thurl	kettle & Kaitlyn Eid (name)	holtz			andard: ush (surch	x 21 days narge may apply) s 7 days Sp	pecify:
Invoice to: Name		Compar	ny		Addı	ress						City		St	ate	Ph#	Fax#
Mike Jury		EGLE			Sag	inaw l	Зау 🛭	Distric	t Offi	се		Sagir	naw	M		517-242-9578	
Relinquished by (printed nan Kaitlyn Eicholtz	ne and signatu	re)	Date 3/8/2020		Time			Rece	eived I	oy (p	orinted name and s	Sa. No	_	1 Illes A	lut	Date	Time 08:41
Relinquished by (printed nan	ne and signatu	re)	Date		Time	9		Rece	eived I	by (p	printed name and s	ignature)			3	Date	Time
SHIP TO: Vista Analytical 1104 Windfield El Dorado Hills, (916) 673-1520	Way CA 95762	3-0106	Method of Shipment: Tracking No.:		Conta	ainer(s	5)		337 18/8/8/8/8/8/8/8/8/8/8/8/8/8/8/8/8/8/8/	7	Banch and Line	· February	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18 1. 18			
Sample ID	Date	Time	Location/Sample Description	13	Times of the	Marie	The second	3 July 3 3	537 CE	Full Lin	830 4 40 8 8 8 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		13/			Comments	
WR2003181420ST	3/18/20	14:20	8456 Church St	2	Р	DW		111					,	x			
	0.10																
Special Instructions/Comments	Sena Resi	iits and i	Acknowledgements to:	mail fo	or distr	ributio	n list			60	SEND	Nai Compa		ephanie Kamn GLE	ier		
			366.6	THOR TO	, dioti	.Datio	, not.				CUMENTATION D RESULTS TO:		_		treet, Co	nstitution Hall, 1s	t South Wes
												Pho	City: La	ansing 7-897-1597			p: 30242
Container Types: P= HDPE, F	PJ= HDPE Jar		Bottle Preserva	tion Ty	/pe: T	= Thio	sulfate	e,	_		Matrix Types: AQ			ammerS@michi Orinking Water, El		t, PP = Pulp/Paper, S	SD = Sediment



Sample Log-In Checklist

Vista Work Orde	er#:	200)600				age#	std	of <u> </u>		
Samples Arrival:	Date/Time	08	ધ્વા	Initials: WRW		Loca	tion: f/Rack	111			
Delivered By:	FedEx	IPS .	On Tra	c GLS	DHI	-	Han- Delive	Othor			
Preservation:	(Ice)	Blu	e Ice		Dry Ice			None		
Temp °C: 3.3		P	robe use	d: Y (N)		Therr	nome	ter ID;	IR-	3	
		10 M 12 1 M K			in the second			YES	NO	NA	
Shipping Contain	er(s) Intact?							V			
Shipping Custody	/ Seals Intact?							V			
Airbill	Trk#	704	3 718	3 614	3			V			
Shipping Docume	entation Preser	nt?	7					V			
Shipping Contain	er	(V	ista /	Client	Re	etain	Re	turn	Disp	oose	
Chain of Custody	/ Sample Doci	ument	tation Pre	sent?				1			
Chain of Custody	The state of the s							V			
Holding Time Acc								V	-		
Logged In:	Date/Time 03 19 20 12	153		Initials:		Locat		R-13,	*		
COC Anomaly/Sa	mple Acceptar	ice Fo	orm comp	leted?					1	1	

Comments:

ID.: LR - SLC

Rev No.: 5

Rev Date: 01/21/2020

Page: 1 of 1

CoC/Label Reconciliation Report WO# 2000600

LabNumber CoC Sample ID		SampleAlias	Sample Date/Time	Container	Sample BaseMatrix Comments
2000600-01 A WR2003181420ST	₫	8456 Church St	18-Mar-20 14:20 🗹	HDPE Bottle, 250 mL	Aqueous
2000600-01 B WR2003181420ST		8456 Church St	18-Mar-20 14:20 🗹	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	Comments:
Sample Container Intact?	1			
Sample Custody Seals Intact?			1	
Adequate Sample Volume?	1			
Container Type Appropriate for Analysis(es)	1			
Preservation Documented: Na2S2O3 Trizma None Other	V			
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	1			
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	1			

Verifed by/Date: WWS 03 19 20

Printed: 3/19/2020 1:01:41PM

Work Order 2000600

Page 1 of 1



April 09, 2020

Vista Work Order No. 2000599

Mr. Dorin Bogdan AECOM 3950 Sparks Drive SE Grand Rapids, MI 49546

Dear Mr. Bogdan,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 19, 2020 under your Project Name 'MPART - Palo, Ionia County, MI'.

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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Work Order 2000599 Page 1 of 15

Vista Work Order No. 2000599 Case Narrative

Sample Condition on Receipt:

One drinking water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

EPA Method 537, Rev. 1.1

The sample was extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

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

A Laboratory Fortified Blank (LFB) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB recoveries were within the method acceptance criteria.

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

Work Order 2000599 Page 2 of 15

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Case Narrative	1
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Sample Inventory	4
Analytical Results	5
Qualifiers	9
Certifications	10
Sample Receipt	13

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Sample Inventory Report

Vista Client
Sample ID Sample ID Sampled Received Components/Containers

2000599-01 WT2003181430ST 18-Mar-20 14:30 19-Mar-20 08:41 HDPE Bottle, 250 mL
HDPE Bottle, 250 mL

Vista Project: 2000599 Client Project: MPART - Palo, Ionia County, MI

Work Order 2000599 Page 4 of 15

ANALYTICAL RESULTS

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Sample ID: LR	В							EP.	A Method 537 l	Rev 1.1
Client Data				La	aboratory Data					
Name:	AECOM	Matrix:	Aqueous	La	b Sample:	B0C0257-	BLK1	Column:	BEH C18	
Project:	MPART - Palo, Ionia County, MI		•						DEIT 010	
Analyte	CAS Numbe	er Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTrDA	72629-94-8	ND ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
Labeled Standards	s Type	% Recovery	I	imits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98	7	0 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
13C2-PFDA	SURR	93		0 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
d5-EtFOSAA	SURR	87	7	0 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ.

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

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Sample ID: LFB

EPA Method 537 Rev 1.1

Client Data Laboratory Data

Name: AECOM Matrix: Aqueous Lab Sample: B0C0257-BS1 Column: BEH C18
Project: MPART - Palo, Ionia County, MI

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	43	35	123	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxA	307-24-4	46	40	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHpA	375-85-9	48	40	121	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxS	355-46-4	42	36	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOA	335-67-1	43	40	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFNA	375-95-1	45	40	114	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOS	1763-23-1	40	37	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDA	335-76-2	42	40	104	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
MeFOSAA	2355-31-9	37	40	93	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
EtFOSAA	2991-50-6	36	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFUnA	2058-94-8	40	40	99	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDoA	307-55-1	37	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTrDA	72629-94-8	36	40	90	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTeDA	376-06-7	35	40	87	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
Labeled Standards		Туре		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR		110	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
13C2-PFDA		SURR		101	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
d5-EtFOSAA		SURR		90	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1

Data Reported per Michigan DEQ instructions.

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Sample ID: W	VT2003181430ST							EP	A Method 537	Rev 1.1
Client Data				Lab	boratory Data					
Name:	AECOM	Matrix:	Drinking Water	Lab	Sample:	2000599-0)1	Column:	BEH C18	
Project:	MPART - Palo, Ionia County, MI	Date Collected:	18-Mar-20 14:30	Dat	te Received:	19-Mar-20	08:41		B211 010	
Location:	8231 Church St									
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	1
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	1
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	109	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	1
13C2-PFDA	SURR	102	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	
d5-EtFOSAA	SURR	102	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:15	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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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.

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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-В
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.

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NELAP Accredited Test Methods

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

MATRIX: Biological Tissue				
Description of Test	Method			
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B			
Dilution GC/HRMS				
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A			
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue	EPA 1668A/C			
by GC/HRMS				
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by	EPA 1699			
HRGC/HRMS				
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537			
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by	EPA 8280A/B			
GC/HRMS				
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA			
Dibenzofurans (PCDFs) by GC/HRMS	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	EPA 1613B		
Dilution GC/HRMS			
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A		
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue	EPA 1668A/C		
by GC/HRMS			
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		
P' ' I GGWPM	ED 4 (12		
Dioxin by GC/HRMS	EPA 613		
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated	EPA 8280A/B		
Dibenzofurans by GC/HRMS	LITTOZOOTUB		
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA		
Dibenzofurans (PCDFs) by GC/HRMS	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	EPA			
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A			

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O = Othework Order 2000599_____

CHAIN OF CUSTODY

TZ = Trizma: TZ

For Laboratory Use Only		
Work Order #: 20059	Temp: 3.3	3
Storage ID: R-13, WR-2	Storage Secured:	Yes 🗹 N

SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: Page 13 of 15

		alo, Ionia County	, MI	PO#: 60560354.14	1			_Sam	npler:	Sara	Thur	kettle & Kaitlyn E (name)	Eicholtz		TAT (check one):	Standard: Rush (sur	charge may apply)	ecify:
Invoice to:	Name		Compan	У		Add	ress						C	ity	-	State	Ph#	Fax#
	Mike Jury		EGLE			Sag	inaw l	Bay D	Distric	ct Offi	ce		Sa	aginaw	1	MI	517-242-9578	
Relinquishe Kaitlyn Eicl		name and signatu	ure)	Date 3/8/2020		Time			Rece	eived	by (p	printed name and	signature	e)	Mini		Date 3 19 20	Time 08:4
Relinquishe	d by (printed	name and signatu	ıre)	Date		Time	9		Rece	eived l	by (p	printed name and	signature	9)	0 111/1/	7/	Date	Time
SHIP TO:	1104 Windf El Dorado F	ical Laboratory ield Way fills, CA 95762 520 * Fax (916) 63	73-0106	Method of Shipment: Tracking No.:		Conta	ainer(s	5)		537 1.65		Sancy 2		\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	17.5 18. 18. 18. 18. 18. 18. 18. 18. 18. 18.	Thus /		
Sar	nple ID	Date	Time	Location/Sample Description	1	mus X	The Man	7/2	2/3	100	TIME!	To John To	/	\$ 3	\$\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\fir}{\fire}}}}}}{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\fir}{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\fir}}}}}}{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{		Comments	
WT20	0318143057	3/18/20	14:30	8231 Church St	2	Р	DW	Ì				700			x		Commente	
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				Tellows I day														
Special Instru	ctions/Comme	ents: Send Res	ults and A	cknowledgements to:	mail fo	r diote	ibution	a liet				SEND			Stephanie K	ammer		
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											AINL	D RESOLIS TO	F	City: Phone:	Lansing 517-897-159 KammerS@r	7	State: MI Zip Fax: 517-241-35	30242
Container Ty	pes: P= HDP	E, PJ= HDPE Jar		Bottle Preserva	tion Ty	pe: T	= Thios	sulfate),			Matrix Types: AC					ent, PP = Pulp/Paper, SI	D = Sedimen



Sample Log-In Checklist

Vista Work Ord	er#:200	0599				ge # _ T	std.	of _	_
Samples Arrival:	Date/Time 3/19/20 08	હિંધા	Initials: WRW		Locati		^	J/A	
Delivered By:	FedEx UPS	On Trac	GLS	DHL	D	Hand		Otl	her
Preservation:	(Ice	Blu	e Ice		Dry I			No	ne
Temp °C: 3.	P	Probe use	d: Y (N)	i	herm	omete	er ID;	IR-	3
Shipping Contain	ner(s) Intact?	e general de la companya de la compa	是是是	phositani manin promining properties			YES	NO	NA
Shipping Custod							V		
Airbill	Trk# 1709	7 718	3 614	3			V		
Shipping Docume	entation Present?		9.1				1		
Shipping Contain	ier (V	/ista	Client	Reta	ain	Reti	urn	Disp	ose
Chain of Custody	/ / Sample Documen	tation Pre	sent?				0		
Chain of Custody	/ Sample Documen	tation Con	nplete?				V		
Holding Time Acc	ceptable?						V		
Logged In:	Date/Time 03 19 20 123		nitials:		ocation		R-13, d-1,	V	
COC Anomaly/Sa	imple Acceptance Fo	orm compl	eted?					1	/

Comments:

ID.: LR - SLC

Rev No.: 5

Rev Date: 01/21/2020

Page: 1 of 1

CoC/Label Reconciliation Report WO# 2000599

LabNumber CoC Sample ID		SampleAlias	Sample Date/Time	Container	Sample BaseMatrix Comments
2000599-01 A WT2003181430ST	卤	8231 Church St	18-Mar-20 14:30	HDPE Bottle, 250 mL	Aqueous
2000599-01 B WT2003181430ST	Ø	8231 Church St	18-Mar-20 14:30 🗹	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	Comments
Sample Container Intact?	1			
Sample Custody Seals Intact?			1	
Adequate Sample Volume?	1		1	
Container Type Appropriate for Analysis(es)	V			
Preservation Documented: Na2S2O3 Trizma None Other	1			
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	V			

Verifed by/Date: WWS 03 19 20

Printed: 3/19/2020 12:39:02PM



April 09, 2020

Vista Work Order No. 2000598

Mr. Dorin Bogdan AECOM 3950 Sparks Drive SE Grand Rapids, MI 49546

Dear Mr. Bogdan,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 19, 2020 under your Project Name 'MPART - Palo, Ionia County, MI'.

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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

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Vista Work Order No. 2000598 Case Narrative

Sample Condition on Receipt:

One drinking water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

EPA Method 537, Rev. 1.1

The sample was extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

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

A Laboratory Fortified Blank (LFB) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB recoveries were within the method acceptance criteria.

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

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Case Narrative	1
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Sample Inventory	4
Analytical Results	5
Qualifiers	9
Certifications	10
Sample Receipt	13

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Sample Inventory Report

Vista Client Sample ID Sample ID Sampled Received Components/Containers

2000598-01 WT2003181515ST 18-Mar-20 15:15 19-Mar-20 08:41 HDPE Bottle, 250 mL HDPE Bottle, 250 mL

Vista Project: 2000598 Client Project: MPART - Palo, Ionia County, MI

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ANALYTICAL RESULTS

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Sample ID: LRB								EP	A Method 537	Rev 1.1
Client Data				Lab	oratory Data					
Name: AECOM		Matrix:	Aqueous	Lab	Sample:	B0C0257-	BLK1	Column:	BEH C18	
Project: MPART - Pa	alo, Ionia County, MI		•		•				BEIT CTO	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
Labeled Standards	Туре	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
13C2-PFDA	SURR	93	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	
d5-EtFOSAA	SURR	87	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ.

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

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Sample ID: LFB

EPA Method 537 Rev 1.1

Client Data Laboratory Data

Name: AECOM Matrix: Aqueous Lab Sample: B0C0257-BS1 Column: BEH C18
Project: MPART - Palo, Ionia County, MI

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	43	35	123	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxA	307-24-4	46	40	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHpA	375-85-9	48	40	121	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxS	355-46-4	42	36	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOA	335-67-1	43	40	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFNA	375-95-1	45	40	114	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOS	1763-23-1	40	37	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDA	335-76-2	42	40	104	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
MeFOSAA	2355-31-9	37	40	93	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
EtFOSAA	2991-50-6	36	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFUnA	2058-94-8	40	40	99	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDoA	307-55-1	37	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTrDA	72629-94-8	36	40	90	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTeDA	376-06-7	35	40	87	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
Labeled Standards		Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR		110	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
13C2-PFDA		SURR		101	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
d5-EtFOSAA		SURR		90	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1

Data Reported per Michigan DEQ instructions.

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Sample ID: WT2003181515ST EPA Method 537 Rev 1.1										
Client Data				Lab	boratory Data					
Name:	AECOM	Matrix:	Drinking Water	Lab	Sample:	2000598-0)1	Column:	BEH C18	
Project:	MPART - Palo, Ionia County, MI	Date Collected:	18-Mar-20 15:15	Dat	te Received:	19-Mar-20	08:41		2211 010	
Location:	8438 Church St									
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	1
PFHxA	307-24-4	5		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	1
PFHpA	375-85-9	4		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	1
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	1
PFOA	335-67-1	10		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	1
PFOS	1763-23-1	4		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	104	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	1
13C2-PFDA	SURR	96	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	
d5-EtFOSAA	SURR	92	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 18:04	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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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.

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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-В
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.

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NELAP Accredited Test Methods

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

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

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O = Other Work Order 2000598

CHAIN OF CUSTODY

For Laboratory Use Only		
Work Order #:	Temp: 3.3	3
Storage ID: R-13, WR-2	Storage Secured:	Yes 🔽 I

SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: Page 13 of 15

Project ID: MPART - Palo, Invoice to: Name	Ionia County	, MI Compan	PO#: <u>60560354.14</u>		Addı	ess	Samp	ler: Sa	a Thu	rkettle & Kaitlyn Eicl (name)	City	TAT (check one)	Standard: Rush (sur 14 d:	charge may apply)	pecify:
Mike Jury		EGLE			Sag	naw E	Bay Dis	trict C	ffice		Sagina	W	MI	517-242-9578	
Relinquished by (printed nam Kaitlyn Eicholtz	Min Sutation)	Date 3/8/2020 Date		Time)		Wil	ICAW	printed name and si				Date 3 19 2 Date	Time
SHIP TO: Vista Analytical 1104 Windfield \ El Dorado Hills, (916) 673-1520 ATTN:	Vay CA 95762	3-0106	Method of Shipment: Tracking No.:		Conta	niner(s	Request	/	Full 16: 14 16:60	19 10 10 10 10 10 10 10 10 10 10 10 10 10	\$ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	18 18 18 18 18 18 18 18 18 18 18 18 18 1	The last of the la		
Sample ID	Date	Time	Location/Sample Description	J. Constant	13	Mathy	18/	3/8	TE TE	Sand Bank	18/3	75 85 15 15 15 15 15 15 15 15 15 15 15 15 15		Comment	S
WT2003181515ST	3/18/20	15:15	8438 Church St	2	P	DW						X			
Special Instructions/Comments:	Send Resu	Its and A	cknowledgements to: See er	nail fo	r distri	bution	list.		PO	SEND CUMENTATION	Name: Company:	Stephanie K	ammer		
										D RESULTS TO:	City: Phone:	525 W. Alleg Lansing 517-897-159 KammerS@r	7	onstitution Hall, 1s State: MI Zi Fax: 517-241-35	p: 30242



Sample Log-In Checklist

Vista Work Orde	er#:20	00597	3			ge# r \$t	of _	
Samples Arrival:	Date/Time 3 19/20 08	ધ્વા	Initials: WRW		ocati	on: Rack: _	NA	
Delivered By:	FedEx UPS	On Tra	ic GLS	DHL	1	Hand elivered		Other
Preservation:	(Ice	Blu	ie Ice		Dry Io	200 2 42 91	-	lone
Temp °C: 3.3	D	robe use	ed: Y I(N)	Т	herm	ometer	ID: IR	3
Shipping Contain Shipping Custody	er(s) Intact?				augo is so sale	VI V	ES NO) NA
Airbill	Trk# 1709	1718	3 6142	3		1	1	
Shipping Docume	entation Present?		W. I			1	/	
Shipping Containe		ista	Client	Reta	in	Return	n Dis	spose
Chain of Custody	/ Sample Document	ation Pre	sent?			0	1	1
	/ Sample Document					Û	/	
Holding Time Acc			The section is			1		
Logged In:	Date/Time 08/19/20 1222		Initials:		ocatio	1	13, WR-2 V V	
COC Anomaly/Sar	mple Acceptance Fo	rm comp	leted?				1	1

Comments:

ID.: LR - SLC

Rev No.: 5

Rev Date: 01/21/2020

Page: 1 of 1

CoC/Label Reconciliation Report WO# 2000598

LabNumber CoC Sample ID		SampleAlias	Sample Date/Time	Container	Sample BaseMatrix Comments
2000598-01 A WT2003181515ST	ď	8438 Church St	18-Mar-20 15:15	HDPE Bottle, 250 mL	Aqueous
2000598-01 B WT2003181515ST	ď	8438 Church St	18-Mar-20 15:15	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	Comments:
Sample Container Intact?	V			
Sample Custody Seals Intact?			1	
Adequate Sample Volume?	1			
Container Type Appropriate for Analysis(es)	1			
Preservation Documented: Na2S2O3 Trizma None Other	1			
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	1			
				4

Verifed by/Date: WUS 03/19/20

Printed: 3/19/2020 12:32:23PM



April 09, 2020

Vista Work Order No. 2000597

Mr. Dorin Bogdan AECOM 3950 Sparks Drive SE Grand Rapids, MI 49546

Dear Mr. Bogdan,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 19, 2020 under your Project Name 'MPART - Palo, Ionia County, MI'.

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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

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Vista Work Order No. 2000597 Case Narrative

Sample Condition on Receipt:

One drinking water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

EPA Method 537, Rev. 1.1

The sample was extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

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

A Laboratory Fortified Blank (LFB) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB recoveries were within the method acceptance criteria.

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

Work Order 2000597 Page 2 of 15

TABLE OF CONTENTS

Case Narrative	1
Table of Contents	3
Sample Inventory	4
Analytical Results	5
Qualifiers	9
Certifications	10
Sample Receipt	13

Work Order 2000597 Page 3 of 15

Sample Inventory Report

Vista Client
Sample ID Sample ID Sampled Received Components/Containers

2000597-01 WR2003181530ST 18-Mar-20 15:30 19-Mar-20 08:41 HDPE Bottle, 250 mL
HDPE Bottle, 250 mL

Vista Project: 2000597 Client Project: MPART - Palo, Ionia County, MI

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ANALYTICAL RESULTS

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Sample ID: L	RB								EP	A Method 537	Rev 1.1
Client Data					Labo	oratory Data					
Name:	AECOM		Matrix:	Aqueous	Lab	Sample:	B0C0257-	BLK1	Column:	BEH C18	
Project:	MPART - Palo, Ionia Co	ounty, MI				-				2211 010	
Analyte		CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxA		307-24-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHpA		375-85-9	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFHxS		355-46-4	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOA		335-67-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFNA		375-95-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFOS		1763-23-1	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDA		335-76-2	ND		2		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
MeFOSAA		2355-31-9	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
EtFOSAA		2991-50-6	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFUnA		2058-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFDoA		307-55-1	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTrDA		72629-94-8	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
PFTeDA		376-06-7	ND		4		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
Labeled Standa	rds	Туре	% Recovery	Limits	•	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	98	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1
13C2-PFDA		SURR	93	70 - 130			B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:08	1

70 - 130

RL - Reporting limit

SURR

d5-EtFOSAA

Results reported to RL.
Reporting convention specified by MI DEQ.

87

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

0.25 L

06-Apr-20 17:08

B0C0257 31-Mar-20

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Sample ID: LFB

EPA Method 537 Rev 1.1

Client Data Laboratory Data

Name: AECOM Matrix: Aqueous Lab Sample: B0C0257-BS1 Column: BEH C18
Project: MPART - Palo, Ionia County, MI

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	43	35	123	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxA	307-24-4	46	40	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHpA	375-85-9	48	40	121	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFHxS	355-46-4	42	36	116	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOA	335-67-1	43	40	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFNA	375-95-1	45	40	114	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFOS	1763-23-1	40	37	108	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDA	335-76-2	42	40	104	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
MeFOSAA	2355-31-9	37	40	93	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
EtFOSAA	2991-50-6	36	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFUnA	2058-94-8	40	40	99	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFDoA	307-55-1	37	40	91	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTrDA	72629-94-8	36	40	90	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
PFTeDA	376-06-7	35	40	87	70 - 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
Labeled Standards		Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR		110	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
13C2-PFDA		SURR		101	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1
d5-EtFOSAA		SURR		90	70- 130		B0C0257	31-Mar-20	0.25 L	06-Apr-20 17:19	1

Data Reported per Michigan DEQ instructions.

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Sample ID: W	/R2003181530ST							EP	A Method 537	Rev 1.1
Client Data Name:	AECOM	Matrix:	Drinking Water		boratory Data Sample:	2000597-0		Column:	BEH C18	
Project: Location:	MPART - Palo, Ionia County, MI 8253 Front St	Date Collected:	18-Mar-20 15:30	Dat	te Received:	19-Mar-20 08:41				
Analyte	CAS Number	Conc. (ng/L)		ŘL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
PFHxA	307-24-4	ND		2		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
PFHpA	375-85-9	ND		2		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
PFHxS	355-46-4	ND		2		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
PFOA	335-67-1	ND		2		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
PFNA	375-95-1	ND		2		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
PFOS	1763-23-1	ND		2		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
PFDA	335-76-2	ND		2		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
MeFOSAA	2355-31-9	ND		4		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
EtFOSAA	2991-50-6	ND		4		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
PFUnA	2058-94-8	ND		4		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
PFDoA	307-55-1	ND		4		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
PFTrDA	72629-94-8	ND		4		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
PFTeDA	376-06-7	ND		4		B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	100	70 - 130			B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1
13C2-PFDA	SURR	89	70 - 130			B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	
d5-EtFOSAA	SURR	88	70 - 130			B0C0257	31-Mar-20	0.26 L	06-Apr-20 17:53	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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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.

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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-В
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.

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NELAP Accredited Test Methods

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

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

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o = Othework Order 2000597

CHAIN OF CUSTODY

TZ = Trizma: TZ

For Laboratory Use Only Work Order #: 200597	Temp: 3	X
Storage ID: R-13, IWR-2	Storage Secured:	Yes ☑ 1

SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _Page 13 of 15

Invoice to: Name Mike Jury Relinquished by (printed name and si Kaitlyn Eicholtz Relinquished by (printed name and si	Compare EGLE gnature)	ny Date		Addr	ess							14 da	ys 7 days Sp	ecity.
Relinquished by (printed name and si Kaitlyn Eicholtz	1.72.77	Date		Sagi						City		State	Ph#	Fax#
Kaitlyn Eicholtz	gnature)	Date		- 5	naw E	Bay D	strict	Office		Sagina	aw	MI	517-242-9578	
Relinquished by (printed name and si		3/8/2020		Time			Receiv	red by (printed name and s	ignature)	111	UAA	Date 3 19 20	Time
remindance by (printed finding and si	nature)	Date		Time) I		Receiv	ed by (printed name and s	gnature)	- 00	MAY W	Date	Time
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WR2003181530ST 3/18	/20 15:30	8253 Front St	2	Р	DW						X			
Special Instructions/Comments: Send	Results and	Acknowledgements to: See e	mail fo	r distri	ibution	ı list.			SEND DCUMENTATION	Compan	y: EGLE	nanie Kammer E V. Allegan Street, Co	pretitution Hall 1e	t South Wos
						=		AN	ID RESULTS TO:	Cit Phon	y: Lans e: 517-8			o: <u>30242</u>



Sample Log-In Checklist

Vista Work Orde	er#:20	00597					ge#_ .T	std .	of	_
Samples Arrival:	Date/Time 3 19/20 C	8:41	Ini	itials: JRW		Locat		: <u> </u>	1/4	
Delivered By:	FedEx UP	S On Ti	rac	GLS	DHI	- -	Hand Deliver		Ot	her
Preservation:	(Ice	В	lue lo	ce		Dry I	ce		No	ne
Temp °C: 3.3		Probe us	sed:	Y IN		Thern	nome	ter ID:	IR.	3
Shipping Contain	per(s) Intact?					1 T. 1868)	YES	NO	NA
Shipping Custod Airbill		109 719	73	Co14"	3			V		
Shipping Docum	entation Present	?						V		
Shipping Contain		(Vista)		Client	R	etain	Re	turn	Dis	oose
Chain of Custody	/ / Sample Docur	nentation P	rese	nt?				0		
Chain of Custody								V		
Holding Time Acc								V		
Logged In:	Date/Time 03 19 20 121	14.	12235	tials:		Locat		R-13,	WR-2 ↓ E-4	
COC Anomaly/Sa	ample Acceptanc	e Form cor	nolet	ed?					/	1

Comments:

ID.: LR - SLC

Rev No.: 5

Rev Date: 01/21/2020

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CoC/Label Reconciliation Report WO# 2000597

LabNumber CoC Sample ID		SampleAlias	Sample Date/Time	Container	Sample BaseMatrix Comments
2000597-01 A WR2003181530ST	Ø	8253 Front St	18-Mar-20 15:30	HDPE Bottle, 250 mL	Aqueous
2000597-01 B WR2003181530ST	位	8253 Front St	18-Mar-20 15:30	HDPE Bottle, 250 mL	Aqueous

2000597

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

	Yes	No	NA	Comments:
Sample Container Intact?	1			
Sample Custody Seals Intact?			1	
Adequate Sample Volume?	1			
Container Type Appropriate for Analysis(es)	1			
Preservation Documented: Na2S2O3 Trizma None Other	V			
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	1			
			_	4

Verifed by/Date: WWS 03 19 20

Printed: 3/19/2020 12:20:46PM



August 03, 2020

Vista Work Order No. 2001528

Dr. Dorin Bogdan AECOM 3950 Sparks Drive SE Grand Rapids, MI 49546

Dear Dr. Bogdan,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on July 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 Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

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Vista Work Order No. 2001528 Case Narrative

Sample Condition on Receipt:

Six drinking water 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:

EPA Method 537.1

The samples were extracted and analyzed for a list of 18 PFAS using EPA Method 537.1. The results have been reported following the conventions specified by the Michigan Department of Environment, Great Lakes, and Energy.

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.

Two Laboratory Fortified Blanks (LFB/LFBD) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB/LFBD recoveries were within the method acceptance criteria.

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

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2001528-01	WR2007161320GGA	16-Jul-20 13:20	21-Jul-20 10:22	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2001528-02	WT2007161330GGA	16-Jul-20 13:30	21-Jul-20 10:22	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2001528-03	WT2007161400GGA	16-Jul-20 14:00	21-Jul-20 10:22	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2001528-04	WT2007161415GGA	16-Jul-20 14:15	21-Jul-20 10:22	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2001528-05	WT2007161500GGA	16-Jul-20 15:00	21-Jul-20 10:22	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2001528-06	WT2007161530GGA	16-Jul-20 15:30	21-Jul-20 10:22	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 2001528 Client Project: Statewide WWTP Biosolids PFAS Evaluation

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ANALYTICAL RESULTS

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										,
Sample ID: LRI	В								EPA Metho	od 537.1
Client Data				Labo	oratory Data					
Name:	AECOM	Matrix:	Aqueous	Lab	Sample:	B0G0209-	BLK1	Column:	BEH C18	
Project:	Statewide WWTP Biosolids PFAS Evalua	ation	•						BEIT CTO	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
PFHxA	307-24-4	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
PFHpA	375-85-9	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
PFHxS	355-46-4	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
PFOA	335-67-1	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
PFNA	375-95-1	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
PFOS	1763-23-1	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
PFDA	335-76-2	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
MeFOSAA	2355-31-9	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
EtFOSAA	2991-50-6	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
PFUnA	2058-94-8	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
PFDoA	307-55-1	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
PFTrDA	72629-94-8	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
PFTeDA	376-06-7	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
HFPO-DA	13252-13-6	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
ADONA	919005-14-4	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
9Cl-PF3ONS	756426-58-1	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
11Cl-PF3OUdS	763051-92-9	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	11
Labeled Standards	Туре	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	92	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
13C2-PFDA	SURR	100	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1
d5-EtFOSAA	SURR	96	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 08:51	1

70 - 130

RL - Reporting limit

SURR

13C3-HFPO-DA

Results reported to RL.

95

Reporting convention specified by MI DEQ.

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

0.25 L

27-Jul-20 08:51

24-Jul-20

B0G0209

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Sample ID: L	FBD				EPA Method 537.1
Name: Project: Matrix:	AECOM Statewide WWTP Biosolids PFAS Evaluation Aqueous	Lab Sample: QC Batch: Samp Size:	B0G0209-BS1/B0G0209-BSD1 B0G0209 0.25/0.25 L	Date Extracted: Column:	24-Jul-20 BEH C18

Analyte	CAS Number	LFB (ng/L)	LFB Spike	LFB	LFB	LFBD	LFBD Spike	LFBD % Rec	RPD	LFBD	%Rec	RPD Limits	LFB Analyzed	LFB Dil	LFBD	LFBD Dil
'		(ng/L)		% Rec	Quals	(ng/L)				Quals			,	ווע	Analyzed	
PFBS	375-73-5	12	14	85		12	14	83	2		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
PFHxA	307-24-4	14	16	85		14	16	86	1		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
PFHpA	375-85-9	16	16	99		16	16	100	1		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
PFHxS	355-46-4	14	15	95		14	15	99	4		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
PFOA	335-67-1	16	16	97		15	16	95	2		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
PFNA	375-95-1	14	16	90		15	16	95	5		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
PFOS	1763-23-1	14	15	91		14	15	95	4		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
PFDA	335-76-2	15	16	92		15	16	94	2		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
MeFOSAA	2355-31-9	15	16	95		15	16	96	1		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
EtFOSAA	2991-50-6	14	16	89		14	16	86	3		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
PFUnA	2058-94-8	15	16	94		15	16	95	1		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
PFDoA	307-55-1	14	16	90		14	16	85	7		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
PFTrDA	72629-94-8	14	16	88		15	16	92	4		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
PFTeDA	376-06-7	13	16	83		14	16	85	2		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
HFPO-DA	13252-13-6	14	16	88		14	16	89	1		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
ADONA	919005-14-4	16	15	109		17	15	113	4		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
9C1-PF3ONS	756426-58-1	14	15	96		13	15	90	6		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
11Cl-PF3OUdS	763051-92-9	14	15	94		14	15	91	3		50-150	50	27-Jul-20 09:02	1	27-Jul-20 09:13	1
				LFB	LFB			LERD		LEDD			LFB	LFB	LFBD	LFBD

		LFB LFB	LFBD	LFBD	LFB	LFB	LFBD	TERD
Labeled Standards	Type	% Rec Quals	% Rec	Quals Limits	Analyzed	Dil	Analyzed	Dil
13C2-PFHxA	SURR	93	93	70-130	27-Jul-20 09:02	1	27-Jul-20 09:13	1
13C2-PFDA	SURR	101	101	70-130	27-Jul-20 09:02	1	27-Jul-20 09:13	1
d5-EtFOSAA	SURR	100	95	70-130	27-Jul-20 09:02	1	27-Jul-20 09:13	1
13C3-HFPO-DA	SURR	96	96	70-130	27-Jul-20 09:02	1	27-Jul-20 09:13	1

Reporting convention specified by MI DEQ.

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Sample ID: V	VR2007161320GGA								EPA Metho	d 537.1
Client Data Name: Project: Location:	AECOM Statewide WWTP Biosolids PFAS Evaluation 8238 CHURCH STREET	Matrix: Date Collected:	Drinking Water 16-Jul-20 13:20	Lab	oratory Data Sample: Received:	2001528-0 21-Jul-20		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
PFHxA	307-24-4	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
PFHpA	375-85-9	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
PFHxS	355-46-4	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
PFOA	335-67-1	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
PFNA	375-95-1	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
PFOS	1763-23-1	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
PFDA	335-76-2	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
MeFOSAA	2355-31-9	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
EtFOSAA	2991-50-6	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
PFUnA	2058-94-8	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
PFDoA	307-55-1	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
PFTrDA	72629-94-8	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
PFTeDA	376-06-7	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
HFPO-DA	13252-13-6	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
ADONA	919005-14-4	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
9Cl-PF3ONS	756426-58-1	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
11Cl-PF3OUdS	763051-92-9	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	96	70 - 130			B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
13C2-PFDA	SURR	104	70 - 130			B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
d5-EtFOSAA	SURR	85	70 - 130			B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1
13C3-HFPO-DA	SURR	97	70 - 130			B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:24	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: W	/T2007161330GGA								EPA Metho	d 537.1
Client Data Name: Project: Location:	AECOM Statewide WWTP Biosolids PFAS Evaluation 4600 CENTER STREET	Matrix: Date Collected:	Drinking Water 16-Jul-20 13:30	Lab	oratory Data Sample: Received:	2001528-0 21-Jul-20		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	3		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
PFHxA	307-24-4	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
PFHpA	375-85-9	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
PFHxS	355-46-4	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
PFOA	335-67-1	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
PFNA	375-95-1	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
PFOS	1763-23-1	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
PFDA	335-76-2	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
MeFOSAA	2355-31-9	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
EtFOSAA	2991-50-6	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
PFUnA	2058-94-8	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
PFDoA	307-55-1	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
PFTrDA	72629-94-8	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
PFTeDA	376-06-7	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
HFPO-DA	13252-13-6	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
ADONA	919005-14-4	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
9C1-PF3ONS	756426-58-1	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
11Cl-PF3OUdS	763051-92-9	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	94	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
13C2-PFDA	SURR	96	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
d5-EtFOSAA	SURR	84	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1
13C3-HFPO-DA	SURR	96	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:35	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: W	/T2007161400GGA								EPA Metho	d 537.1
Client Data Name: Project: Location:	AECOM Statewide WWTP Biosolids PFAS Evaluation 8194 FRONT STREET	Matrix: Date Collected:	Drinking Water 16-Jul-20 14:00	Lab S	oratory Data Sample: Received:	2001528-0 21-Jul-20		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
PFHxA	307-24-4	4		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
PFHpA	375-85-9	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
PFHxS	355-46-4	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
PFOA	335-67-1	3		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
PFNA	375-95-1	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
PFOS	1763-23-1	2		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
PFDA	335-76-2	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
MeFOSAA	2355-31-9	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
EtFOSAA	2991-50-6	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
PFUnA	2058-94-8	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
PFDoA	307-55-1	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
PFTrDA	72629-94-8	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
PFTeDA	376-06-7	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
HFPO-DA	13252-13-6	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
ADONA	919005-14-4	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
9C1-PF3ONS	756426-58-1	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
11Cl-PF3OUdS	763051-92-9	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
Labeled Standar	ds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	97	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
13C2-PFDA	SURR	96	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
d5-EtFOSAA	SURR	97	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1
13C3-HFPO-DA	SURR	98	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 09:46	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: W	/T2007161415GGA								EPA Metho	d 537.1
Client Data Name: Project: Location:	AECOM Statewide WWTP Biosolids PFAS Evaluation 8441 CHURCH STREET	Matrix: Date Collected:	Drinking Water 16-Jul-20 14:15	Lab S	oratory Data Sample: Received:	2001528-0 21-Jul-20		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
PFHxA	307-24-4	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
PFHpA	375-85-9	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
PFHxS	355-46-4	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
PFOA	335-67-1	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
PFNA	375-95-1	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
PFOS	1763-23-1	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
PFDA	335-76-2	ND		2		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
MeFOSAA	2355-31-9	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
EtFOSAA	2991-50-6	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
PFUnA	2058-94-8	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
PFDoA	307-55-1	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
PFTrDA	72629-94-8	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
PFTeDA	376-06-7	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
HFPO-DA	13252-13-6	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
ADONA	919005-14-4	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
9Cl-PF3ONS	756426-58-1	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
11Cl-PF3OUdS	763051-92-9	ND		4		B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	101	70 - 130			B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
13C2-PFDA	SURR	109	70 - 130			B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
d5-EtFOSAA	SURR	105	70 - 130			B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1
13C3-HFPO-DA	SURR	103	70 - 130			B0G0209	24-Jul-20	0.24 L	27-Jul-20 09:57	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: W	/T2007161500GGA								EPA Metho	d 537.1
Client Data Name: Project: Location:	AECOM Statewide WWTP Biosolids PFAS Evaluation 4543 VAN VLECK ROAD	Matrix: Date Collected:	Drinking Water 16-Jul-20 15:00	Lab	oratory Data Sample: Received:	2001528-0 21-Jul-20		Column:	BEH C18	
Analyte		Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
PFHxA	307-24-4	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
PFHpA	375-85-9	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
PFHxS	355-46-4	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
PFOA	335-67-1	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
PFNA	375-95-1	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
PFOS	1763-23-1	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
PFDA	335-76-2	ND		2		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
MeFOSAA	2355-31-9	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
EtFOSAA	2991-50-6	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
PFUnA	2058-94-8	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
PFDoA	307-55-1	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
PFTrDA	72629-94-8	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
PFTeDA	376-06-7	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
HFPO-DA	13252-13-6	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
ADONA	919005-14-4	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
9Cl-PF3ONS	756426-58-1	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
11Cl-PF3OUdS	763051-92-9	ND		4		B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	95	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
13C2-PFDA	SURR	103	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
d5-EtFOSAA	SURR	92	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1
13C3-HFPO-DA	SURR	94	70 - 130			B0G0209	24-Jul-20	0.25 L	27-Jul-20 10:08	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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Sample ID: V	VT2007161530GGA								EPA Metho	d 537.1
Client Data Name: Project: Location:	AECOM Statewide WWTP Biosolids PFAS Evaluation 8215 FRONT STREET	Matrix: Date Collected:	Drinking Water 16-Jul-20 15:30	Lab	oratory Data Sample: Received:	2001528-0 21-Jul-20		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
PFHxA	307-24-4	ND		2		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
PFHpA	375-85-9	ND		2		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
PFHxS	355-46-4	ND		2		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
PFOA	335-67-1	ND		2		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
PFNA	375-95-1	ND		2		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
PFOS	1763-23-1	ND		2		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
PFDA	335-76-2	ND		2		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
MeFOSAA	2355-31-9	ND		4		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
EtFOSAA	2991-50-6	ND		4		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
PFUnA	2058-94-8	ND		4		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
PFDoA	307-55-1	ND		4		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
PFTrDA	72629-94-8	ND		4		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
PFTeDA	376-06-7	ND		4		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
HFPO-DA	13252-13-6	ND		4		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
ADONA	919005-14-4	ND		4		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
9Cl-PF3ONS	756426-58-1	ND		4		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
11Cl-PF3OUdS	763051-92-9	ND		4		B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
Labeled Standa	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	92	70 - 130			B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
13C2-PFDA	SURR	96	70 - 130			B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
d5-EtFOSAA	SURR	99	70 - 130			B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1
13C3-HFPO-DA	SURR	95	70 - 130			B0G0209	24-Jul-20	0.22 L	27-Jul-20 10:19	1

Results reported to RL.

Reporting convention specified by MI DEQ..

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

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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)

MDL Method Detection Limit

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.

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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-В
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.

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NELAP Accredited Test Methods

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

MATRIX: Biological Tissue	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B
Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue	EPA 1668A/C
by GC/HRMS	
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by	EPA 1699
HRGC/HRMS	
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by	EPA 8280A/B
GC/HRMS	
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	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	EPA 1613B
Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue	EPA 1668A/C
by GC/HRMS	
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
P' ' I GGWPM	ED 4 (12
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated	EPA 8280A/B
Dibenzofurans by GC/HRMS	LITTOZOOTUB
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	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	EPA 8280A/B
Dibenzofurans by GC/HRMS	
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

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Stephanie Kammer

Relinquished by (printed name and signature)

Invoice to: Name

Project ID: Statewide WWTP Biosolids PFAS Evaluation

CHAIN OF CUSTODY

Address

525 W. Allegan Street

PO#: 60588767.01

Company

MDEQ

Υ	For Labo Work Ord Storage II	40 10 111	1528	Temp:Storage Secured	Ц <u></u> °С : Yes [У́ № □
		TAT	Standard:	x 21 days	
pler: George Austin		(check one):	Rush (surch	arge may apply)	
(name)			14 days	s7 days Sp	ecify:
	City		State	Ph#	Fax#
Street	Lansing		MI	517-897-1597	517-241-3571
Received by (printed name and signat	ture) 1	ā i		Date	Time
William Pleikirkt	all	RUH		07/21/20	10:22
Received by (printed name and signat	ture)			Date	Time

	d by (printed name and	a signature)		Date		Time			Recei	- Ivea i	. У	rinte	d name and sign	ature)			Date Time
SHIP TO:	Vista Analytical Labor 1104 Windfield Way El Dorado Hills, CA 9 Ph: (916) 673-1520; F	5762	106	Method of Shipment:	Add	Analys	sis(es)	Reque	ested	/	/		PFAS 15010 Dillution			/	
ATTN:	Jennifer Miller			Tracking No.:		/ ,	ainer(List of 2 W180mer.	*/ */***	187 180 180 187	\$ 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	/5	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Comments
WR20071613	ample ID 320GGA	Date 7/16/20	1 ime 1320	Location/Sample Description 8238 CHURCH STREET	2	P	DM	(3)		3/	3	/ 🌣	70 &			X	TZ; KITCHEN FAUCET, NO TREATMENT
WT20071613		7/16/20	1330	4600 CENTER STREET	2	Р	DW			\dashv				\top		х	TZ; OUTDOOR SPIGOT
WT20071614	100GGA	7/16/20	1400	8194 FRONT STREET	2	Р	DW							\top		х	TZ; SAMPLED VIA HOSE FROM OUTDOOR SPIGOT
WT20071614	115GGA	7/16/20	1415	8441 CHURCH STREET	2	Р	DW									х	TZ; OUTDOOR SPIGOT
WT20071615	600GGA	7/16/20	1500	4543 VAN VLECK ROAD	2	Р	DW									х	TZ; PRESSURE TANK
WT20071615	30GGA	7/16/20	1530	8215 FRONT STREET	2	Р	DW									х	TZ; SAMPLED VIA HOSE FROM OUTDOOR SPIGOT
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Special Instru	uctions/Comments:	Send Kes	uits and	Acknowledgements to the	list pro	ovided						CUI	SEND MENTATION ESULTS TO:	Com	pany:	MDI	phanie Kammer EQ W. Allegan Street, Constitution Hall, 1st South West
											AIN	io K	LUCE 10.		City	Lan	sing State: MI Zip: 30242
		· · · · ·	_														-897-1597 Fax: 517-241-3571 h.bogdan@aecom.com
Cantaina T	- UDDE BI-UD	DDE 1=4		Bottle Preservation Type	. T - T	hioo. I	fate			Matri	. Tue		AO = Aguagus DV				EF = Effluent, PP = Pulp/Paper, SD = Sediment,
O = Other:	/pes: P= HDPE, PJ= HD	DEE 191		TZ = Trizma.	:: 1 = 1	riiosun	ale,										ater, B = Blood/Serum, O = Other:

Sampler: George Austin

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Sample Log-In Checklist

Vista Work Orde	r#:	2	001529	8_				age # _ AT	sto	of	_ 	
Samples	Date/Tin	ne		Ini	itials:	Location: WE-Z						
Arrival:	67/21	20 10	:22		WA	لهر	Shel	f/Rack	:NA			
Delivered By:	FedEx	UPS	On Tra	c	GLS	DHL	-	Hand Deliver		Oth	ier	
Preservation:	(lo	ce	Blu	ue Ice Tec				Dry	Ice	No	ne	
Temp °C: [];]	(uncorrected) Probe used: Y (N) Thermomet									ter ID: TR-3		
Temp °C: إلى إ	(correc	ted)		eu.	1 /(N)		Titel	mome	ter ib.	<u> </u>	<u> </u>	
	**************************************			Kali 3		THE RESERVE		(Charles	YES	NO	NA	
Shipping Contain	er(s) Intac	±†?	A MANAGEMENT						ν	110	NA.	
Shipping Custody											\overline{X}	
Airbill /			49 76	15	98	20			/			
Shipping Docume									i/			
Shipping Contain	er		Vista	<	Client	R	etain	Re	eturn	Dis	pose	
Chain of Custody	/ Sample	Docume	ntation Pr	ese	nt?			``	V			
Chain of Custody	/ Sample	Docume	ntation Co	mp	lete?				√			
Holding Time Acc	ceptable?								1/			
	Date/Tin	,		In	itials:		Loca	ation:	R-13,	WR-2		
Logged In:	07/22	28	MUS			Shel	f/Rack	: <u> </u>	B-5			
COC Anomaly/Sa	ample Acc	eptance	Form com	ple	ted?					1	1	

Comments:

ID.: LR - SLC

Rev No.: 6

Rev Date: 07/16/2020 ··

Page: 1 of 1

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Sample Log-In Checklist

Vista Work Orde	2td											
Samples	Date/Tim	ie		Ini	tials:		Loca	tion:	U,	1R-2	_	
Arrival:	67/2	1/20	16:22	(elle)	Shelf/Rack:					
Delivered By:	FedEx	UPS	On Tra	ic	GLS	DHL	-	Han Delive		Other		
Preservation:	To	è	Blu	ue Ic	ce	Tec		Dry	Ice	No	ne	
Temp °C: 4,1	(uncorr	ected)	Droho usa	-d.	V IOR		Thor		meter ID: IL-3			
Temp °C: $\mathcal{H}_{i}/$	Temp °C: \mathcal{H}_{i} (corrected)											
	THE VOLUME TO SERVE	617 C 1977 4 1 1 1 1 1							1 1/50	110		
ACTOR SECTION AND ADDRESS.	C PRO KNEW	No. of Persons Inc.				S HAVE	THE REAL PROPERTY.		YES	_NO	NA	
Shipping Contain	er(s) Intac	<u>t?</u>		_					<u> </u>	_		
Shipping Custody	Seals Inta	act?									X	
Airbill —	Trk	# 394	9 756	27	843	32			1			
Shipping Docume									V			
Shipping Contain		$\overline{}$	———— Vista	7	Client	Re	etain	Re	eturn	Dis	pose	
Chain of Custody	/ Sample	Docume	ntation Pre	eser	nt?							
Chain of Custody	/ Sample	Docume	ntation Co	mpl	ete?						X	
Holding Time Acc	eptable?										X	
Loggod In:	Date/Tim				tials:		Loca	tion: R-13, WR-2				
Logged In:	07/22/20	0828		WUS			Shelf/Rack: $\frac{3}{3}$, $\frac{8}{5}$					
COC Anomaly/Sa	mple Acce	eptance	Form com	plete	ed?					/	/	

Comments:

ID.: LR - SLC Rev No.: 6

Rev Date: 07/16/2020

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CoC/Label Reconciliation Report WO# 2001528

LabNumber	CoC Sample ID		SampleAlias	Sample Date/Time		Container	Sample BaseMatrix Comments
2001528-01	A WR2007161320GGA	CITE	8238 CHURCH STREET	16-Jul-20 13:20	O'	HDPE Bottle, 250 mL	Aqueous
2001528-01	B WR2007161320GGA		8238 CHURCH STREET	16-Jul-20 13:20	3	HDPE Bottle, 250 mL	Aqueous
2001528-02	A WT2007161330GGA	COTE	4600 CENTER STREET	16-Jul-20 13:30	G/	HDPE Bottle, 250 mL	Aqueous
2001528-02	B WT2007161330GGA		4600 CENTER STREET	16-Jul-20 13:30		HDPE Bottle, 250 mL	Aqueous
2001528-03	A WT2007161400GGA	B	8194 FRONT STREET	16-Jul-20 14:00		HDPE Bottle, 250 mL	Aqueous
2001528-03	B WT2007161400GGA		8194 FRONT STREET	16-Jul-20 14:00		HDPE Bottle, 250 mL	Aqueous
2001528-04	A WT2007161415GGA		8441 CHURCH STREET	16-Jul-20 14:15	0	HDPE Bottle, 250 mL	Aqueous
2001528-04	B WT2007161415GGA		8441 CHURCH STREET	16-Jul-20 14:15	3	HDPE Bottle, 250 mL	Aqueous
2001528-05	A WT2007161500GGA		4543 VAN VLECK ROAD	16-Jul-20 15:00	3	HDPE Bottle, 250 mL	Aqueous
2001528-05	B WT2007161500GGA	D	4543 VAN VLECK ROAD	16-Jul-20 15:00		HDPE Bottle, 250 mL	Aqueous
2001528-06	A WT2007161530GGA		8215 FRONT STREET	16-Jul-20 15:30		HDPE Bottle, 250 mL	Aqueous
2001528-06	B WT2007161530GGA) E	8215 FRONT STREET	16-Jul-20 15:30		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.

<u>- · · · · · · · · · · · · · · · · · · ·</u>	Yes	No	NA	Comments:	C1:	Coole 1 of 2
Sample Container Intact?					ca:	Cooler 2 of 2
Sample Custody Seals Intact?				•		
Adequate Sample Volume?	/			•		
Container Type Appropriate for Analysis(es)	/	,				
Preservation Documented: Na2S2O3 (rizma None Other	/					
If Chlorinated or Drinking Water Samples, Acceptable Preservation?						

Verifed by/Date: Lx 07/22/20

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