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Evaluation of Lapeer WWTP Biosolids Site 08n11e33-SK01

Lapeer County, MI

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1. Introduction

This technical memorandum summarizes and reports the findings at the privately owned site 08n11e33-SK01 (Site) (**Figure 1**). The purpose of the investigation was to determine the impact, if any, from the potential land application of Per- and Polyfluroalkyl Substances (PFAS)-impacted biosolids from the City of Lapeer Wastewater Treatment Plant (WWTP) in the soil, groundwater and adjacent surface water bodies.

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

2. Background

The Site (**Figure 1**) is an actively farmed field where corn was planted for ethanol production in the 2018 growing season. As a result of the farming activities, all soil sampling and well installation was completed prior to spring planting at the request of the owner. The investigation was conducted by AECOM on behalf of the Michigan Department of Environmental Quality (MDEQ) and was performed in accordance with applicable AECOM, MDEQ, and US Environmental Protection Agency (USEPA) guidance documents, including the site-specific Sampling and Analysis Plan (SAP) and the Quality Assurance Project Plan (QAPP).

PFAS have been classified by the USEPA as an emerging contaminant, that are regulated by the MDEQ 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 3,000 man-made fluorinated organic chemicals. Due to their unique chemical properties, PFAS have been used in many industries and consumer products since the late 1950's. The Interstate Technology Regulatory Council (ITRC) has identified four major sources of PFAS: fire training/fire response sites, industrial sites, landfills, and wastewater treatment plants/biosolids.

Preliminary surface water and fish tissue sampling performed by the MDEQ in 2013 and 2014 on the Flint River found concentrations of perfluorooctane sulfonic acid (PFOS) above Michigan's Part 31 Water Quality Standard and Michigan Department of Health and Human Services (MDHHS) screening values for fish tissue. As a result, in 2015, MDHHS released an updated "Eat Safe Fish" guidance where PFOS was the driver for the fish consumption advisory for several species on the Flint River downstream of Mott Dam. Subsequent surface water and fish collection was conducted in 2016 to investigate the potential sources of PFAS to the river the results of which indicated that there was a PFAS source located upstream of Holloway Dam. In 2017, additional monitoring was conducted upstream of Holloway Dam, of major tributaries of the Flint River, and of the three major wastewater treatment plants which discharge to the River within the area of concern. Analysis of the City of Lapeer's WWTP effluent identified the WWTP as a significant source of PFOS to the Flint River in May of 2017. Subsequently, an industrial user to the WWTP was identified as contributing significant amounts of PFOS to the City's sewer system.

The City of Lapeer was authorized to land-apply biosolids from the Lapeer WWTP in accordance with a Residuals Management Program (RMP) approved by the MDEQ on October 17, 2000. During land application, biosolids are injected below the surface to a maximum depth of 12 inches. Due to the elevated levels of PFAS identified in the effluent from the WWTP and concerns regarding the potential for

PFAS-impacted biosolids being land applied, the MDEQ requested the City of Lapeer analyze their biosolids for PFAS on August 24, 2017. Results indicated that PFAS was present in biosolids at elevated concentrations. The concentration of PFOS was found to be the highest at 2,100 nanograms per gram (ng/g) or parts per billion (ppb). In order to evaluate the potential impact of PFAS-contaminated biosolids in fields where they were land applied by the City of Lapeer, the MDEQ conducted a file review and identified 38 fields used by the City of Lapeer for land application of biosolids since 1997. Access to records of land application prior to 1997 is limited.

The MDEQ conducted an initial, limited investigation in December 2017 at the Site owned by the City of Lapeer (8n10e33-CL01) that included three surface soil samples and one surface water sample. The results of the initial MDEQ investigation indicated the highest PFAS concentration was PFOS, with an average soil concentration of 500 ppb. In addition, PFOS levels in the pond located on the northeast side of the City owned field were reported at 2,000 nanograms per liter (ng/L) or parts per trillion (ppt) which is above the Part 31 water quality value of 12 ppt. The presence of elevated levels of PFOS in the soils and pond water indicated the potential for PFOS to be present in adjacent groundwater and/or surface waters. The MDEQ's drinking water cleanup criterion under Part 201 is 70 ng/L for PFOS, perfluorooctanoic acid (PFOA), or the sum of both compounds.

Based on the data results from the parcel owned by the City of Lapeer (8n10e33-CL01), the MDEQ determined that additional monitoring was necessary to evaluate potential, if any, impacts to resources and chose additional fields for investigation.

One of those Sites was 08n11e33-SK01 (**Figure 1**). The MDEQ prioritized this site for monitoring based on several factors. The site had received a moderate number (6) of applications of biosolids from the City during a period of time when it is suspected that PFOS concentrations levels in biosolids may have been higher than what was measured in 2017 due to a PFOS-based fume suppressant being used at the industrial user as part of their process. Approximately 700 dry tons of biosolids were applied to the field since 1997 with the last application occurring in 2006. However, based on conversations with the landowner, as shown in **Figure 2**, biosolids from the Lapeer WWTP were only applied to the western portion of parcel 08n11e33-SK01. **Table 1** summarizes the application data based on the review of the City of the Lapeer biosolids annual reports provided by the MDEQ. In addition, the Site offered a contrast of soil types to those at the City site, had a surface water body (Lake Pleasant Drain) immediately adjacent to the Site and was located in a well head protection area for a manufactured housing community with a Type I community well.

From April 27, 2018 through May 01, 2018, AECOM conducted a field investigation to determine the impact, if any, from the land application of PFAS-impacted biosolids from the City of Lapeer WWTP in the soil, groundwater and adjacent surface water bodies at the Site. Subsequent to the AECOM investigation, the MDEQ collected fish tissue and surface water samples in August 2018 from Lake Pleasant, located approximately 3,400 feet south of the Site (**Figure 1**). In addition, the MDEQ is sampling all of the State's public water supplies, including Lapeer County, for PFAS.

3. Hydrogeology/Geology

The geology and topography of the site is 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 of coarse-textured till. To the west of the Site are deposits of lacustrine clay and silt and to the east are deposits of glacial outwash sand and gravel. Soil borings installed during the investigation generally encountered sand containing gravel, underlain by clay at depths ranging from 8.5 to 16 feet below ground surface (bgs). However, at TMW1 a shallow, clayey sand with gravel was encountered, but no clay was observed deeper in the boring to the total depth of 20 feet bgs. Boring logs are provided in **Appendix A**.

The Lapeer County Soil Survey identified two primary types of surface soils in the three Decision Units (DUs) in which surface soil samples were collected. They are described by the U.S. Department of

Agriculture as the Capac fine sandy loam (CaA and CaB) and the Chelsea loamy sand (ChB and ChC). The Capac soils are located on till plains and have excessive wetness in early spring, but the soil material is stable. The Chelsea soils are located on broad outwash plains and due to the rapid permeability have low water capacity. The Site soils identified in the Lapeer County Soil Survey are shown on **Figure 2** and are described in **Appendix B**.

Regional groundwater flow is expected to generally be towards surface water bodies such as ponds and streams. The general groundwater elevation map, based on MDEQ-provided shallow groundwater elevation data, is provided in **Figure 3** and indicates groundwater flow is to the west, southwest. **Figure 3** also shows that the primary groundwater discharge point is the Lake Pleasant Drain, located along the western Site boundary.

4. Scope of Work

Soil, groundwater and surface water samples were collected from the Site to further characterize PFAS. Three surface soil samples were collected from each of the three DUs using Incremental Sampling Methodology (ISM). A total of nine soil samples were sent for laboratory analysis. Groundwater was collected from six temporary monitoring wells. The Scope of Work called for the collection of three surface water samples and five drain tile water samples; however, the drain tiles could not be physically located so surface water samples were collected from their approximate locations based on MDEQ-provided global positioning system (GPS) coordinates and other evidence, such as disturbance of the surface water (e.g. ripples), that suggested flow from the tiles into the surface water. The MDEQ subsequently collected nine fish tissue samples and two surface water samples from Lake Pleasant.

The soil, groundwater, and surface water samples were submitted to Vista Analytical Laboratories and analyzed using the isotope dilution method for a list of 24 PFAS which included:

- PFBA = Perfluorobutanoic acid
- PFPeA = Perfluoropentanoic acid
- PFPeS = Perfluoropentane sulfonic acid
- PFHxA – Perfluorohexaonic acid
- PFHpA = Perfluoroheptanoic acid
- PFOA = Perfluorooctanoic acid
- PFNA = Perfluorononanoic acid
- PFDA = Perfluorodecanoic acid
- PFUnDA = Perfluoroundecanoic acid
- PFDoDA = perfluorododecanoic acid
- PFTeDA = Perfluorotetradecanoic acid
- PFTrDA = Perfluorotridecanoic acid
- EtFOSAA = N-Ethyl perfluorooctane sulfonamide
- MeFOSAA = N-methylperfluoro-1-octane sulfonamide
- PFBS = Perfluorobutane sulfonic acid
- PFHxS = Perfluorohexane sulfonic acid
- PFHpS = Perfluoroheptane sulfonic acid
- PFNS = Perfluorononane sulfonic acid

- PFOS = Perfluorooctane sulfonic acid
- PFDS = Perfluorodecane sulfonic acid
- 4:2 FTS = 4:2 fluorotelomer sulfonate
- 6:2 FTS = 6:2 fluorotelomer sulfonate
- 8:2 FTS = 8:2 fluorotelomer suflonate
- PFOSA = Perfluorooctane sulfonamide

The nine soil samples were also submitted to Test America Laboratories for total organic carbon (TOC) analysis using the Lloyd Kahn Method.

5. Surface Soil

Surface soil samples were collected on April 27, 2018 according to the MDEQ's ISM and Applications guidance document. This document is based on the ITRC 2012 Incremental Sampling Methodology. The spreading of the biosolids was assumed to have been applied consistently at a depth of 8 inches across the Site based on information provided by the MDEQ. The various soil types identified in the soil survey could influence the adsorption of PFAS. In order for the sampling to be representative of the entire site, the soil samples were taken from areas with various soil types, as described in *Section 3* that covered at least 50% of the entire Site. A total of three DU areas of one acre each was selected, and a total of three soil samples were collected from each DU in accordance with the MDEQ's Incremental Sampling Methodology and Applications guidance document (**Figure 2**). A total of 50 incremental sampling points were collected for each soil sample (approximately 24 grams each), resulting in a total sample mass of approximately 1,200 grams.

A one-inch diameter soil coring tool was used and was advanced to 8 inches below the ground surface (bgs), with the bottom two inches collected for analysis.

The PFAS data are summarized in the table below and attached **Table 2, Figure 4** and **Figure 5**. Laboratory reports are provided in **Appendix C**.

Soil Sample IDs	Total PFAS Mean Value (ng/g)	PFOA Mean Value (ng/g)	PFOS Mean Value (ng/g)
SK1-DU1	13.9	ND	11.7
SK1-DU2	9.5	0.3	6.8
SK1-DU3	3.2	ND	1.7

All of the soil samples collected from the three DUs exceeded the Part 201 GSI protection criterion.

Both of the DUs with the highest and lowest PFAS/PFOS concentrations, DU1 and DU3, respectively, were located in areas with the Capac fine sandy loam (CaA and CaB) present. This observation suggests that the soil at both DUs, although identified as a sandy loam, may be somewhat heterogeneous. However, it should be noted that the difference between the maximum and minimum mean values is only approximately 10 ng/g.

The TOC analytical results ranged from 5,500 to 8,900 milligrams per kilogram (mg/Kg) or parts per million with average TOC values for DU1, DU2 and DU3 of 8,133 mg/Kg, 6,400 mg/Kg and 6,667 mg/Kg, respectively. The maximum TOC values are associated with DU1 and the Capac fine sandy loam (CaA). **Table 3** summarizes the TOC data by DU sample and compares it to total PFAS concentration, soil survey classification and the soil lithology logged in the soil borings within the DUs. The soils observed in the soil borings at each of the DUs were generally sand with gravel. These coarse-grained soils resulted

in lower TOC values compared to the City owned Site where the TOC values ranged from 13,000 to 23,000 mg/Kg and the soils were generally more fine grained.

6. Groundwater

Between April 30, 2018 and May 01, 2018, AECOM and Job Site Services (JSS) installed six temporary monitoring wells TMW-1, TMW-2, TMW-3, TMW-4, TMW-5 and TMW-6 (**Figure 3**; **Table 4**). The scope of work proposed six locations within the active farming field for the purpose of collecting groundwater samples and providing groundwater elevation measurements. At the request of the property owner, each temporary monitoring well was pulled after sampling was complete, with no materials left in the ground overnight. Surveying of groundwater and surface elevations could not be conducted due to the limited amount of time each well could be in the ground. Due to this lack of data, groundwater flow is based on MDEQ-provided shallow groundwater elevation data (**Figure 3**) and is assumed to flow in a westerly direction towards the Lake Pleasant Drain.

Temporary monitoring wells TMW2, TMW5, and TMW4 were collocated with decision units DU1, DU2 and DU3, respectively, to evaluate potential impacts to the groundwater from the surface soils. Temporary monitoring well TMW1 was selected as an upgradient boundary point and temporary monitoring wells TMW3 and TMW6 were selected as downgradient locations along the western Site boundary and to evaluate discharge into the Lake Pleasant Drain. All locations were originally chosen as groundwater elevation points to confirm groundwater flow direction.

Prior to any intrusive work being conducted a utility clearance was conducted by MISS DIG, Michigan's one-call utility locating service. In addition, a third party, Underground Detectives out of Toledo, OH, conducted a sub-surface investigation. There were known drain tiles across the site at an approximate depth of 4 feet bgs. All boring site locations were marked by AECOM and cleared by the utility locating contractor. No anomalies were encountered at the Site and none of the locations needed to be relocated.

Temporary Monitoring Wells

JSS completed the soil borings by hand augering the first 5 feet bgs and then using a Geoprobe 7720DT direct push drilling rig. Both hand augering and 3-inch dual tube system were used to continually core soils. Cored soils were logged at each of the borings from the surface to the total depth (**Appendix A**). Once water was encountered, a final dual tube sample was collected approximately 5 feet past the vadose zone to confirm groundwater. After the boring reached total depth, hollow stem auger drilling was utilized to over drill the soil boring to approximately 4 feet below groundwater. The borings ranged in depth from 10 to 20 feet bgs.

Groundwater Sampling

Six groundwater samples were collected from the Site using temporary monitoring wells. The locations are shown on **Figure 3**. Prior to the collection of the groundwater samples, static water levels were measured using an electronic water tape from the top of the well casing of each of the wells. Each monitoring well was purged and groundwater samples were collected for PFAS analysis in laboratory supplied containers. Water quality parameters (temperature, specific conductance, pH, dissolved solids, oxidation-reduction potential, and turbidity) were recorded following AECOM groundwater Standard Operating Procedures using an YSI Pro DDS water quality meter. Water quality measurements recorded during purging are summarized in **Table 5**.

The data is summarized in the table below and attached **Table 6**, **Figure 6** and **Figure 7**.

Well Sample IDs	Total PFAS (ng/L)	PFOS (ng/L)	PFOA (ng/L)	PFOA + PFOS (ng/L)
SK1-TMW1	13.6	1.3	ND	1.3
SK1-TMW2	61.5	9.8	ND	9.8
SK1-TMW3	5.3	0.9	0.6	1.6
SK1-TMW4	1.9	ND	ND	ND
SK1-TMW5	169.1	15.2	8.6	23.8
SK1-TMW6	14.0	ND	0.7	0.7

Part 201 criteria were exceeded at one location, TMW5 (**Table 6** and **Figure 7**). PFOS exceeded the Part 31 Water Quality Value of 12 ng/L in TMW5 with a result of 15.2 ng/L.

The highest PFAS concentrations in groundwater were located southeast of the pond located on the western edge of the site in the sample from TMW-5 screened from 6 ft to 11 ft bgs. The lowest detected concentrations were located in the north part of the site, west of the buildings, in the sample from TMW-4 screened from 10 ft to 15 ft bgs.

7. Surface Water

Surface water samples were collected from eight locations (located both on and off the site). As previously discussed, five of the surface water samples were collected from approximate drain tile locations based on MDEQ-provided GPS coordinates and other evidence, such as disturbance of the surface water (e.g. ripples), that suggested flow from the tiles into the surface water. The analytical results are summarized in the table below and attached **Table 7, Figure 8** and **Figure 9**.

Surface Water Sample IDs	Total PFAS (ng/L)	PFOS (ng/L)	PFOA (ng/L)
SK1-SW1	75.0	51.4	7.3
SK1-SW2	16.0	ND	0.8
SK1-SW3	8.9	ND	0.6
SK1-DR1	28.3	12.0	2.2
SK1-DR2	18.5	2.9	1.1
SK1-DR3	2,162.9	2,080.0	26.1
SK1-DR4	15.7	5.6	3.1
SK1-DR5	132.4	90.2	8.1
Pleasant-01	23.26	6.1	3.7
Pleasant-02	19.3	6.5	3.6

Part 31 water quality standards were exceeded at three locations, SW1, DR3, and DR5 (**Table 7** and **Figure 9**). PFOS exceeded the Part 31 Water Quality Value (12 ng/L) in SW1 (51.4 ng/L), DR3 (2,080 ng/L), and DR5 (90.2 ng/L).

The highest total PFAS and PFOS concentration (DR3) was collected from the end of a submerged PVC pipe in Lake Pleasant Drain located on the southwest side of the Site. SW1 is located downstream of the

DR3 location. The lowest concentrations (SW-2 and SW-3) were collected from the pond and upstream of the site in the Lake Pleasant Drain, respectively. Both samples were non-detect for PFOS.

The surface water sampling locations are described below.

SW1 was located in Lake Pleasant Drain just downstream of the Site. It is the most downstream surface water sample location.

SW2 was collected from the small pond along the Site's western property boundary.

SW3 was located at the northwest corner of the Site in the Lake Pleasant Drain.

DR1 was collected at the northwest corner of the property from the Pleasant Lake Drain downstream of SW3. AECOM Field staff was unable to locate any form of drain tile and was instructed by MDEQ staff to collect a surface water sample from the location in the event that the drainage tile was not visible.

DR2 was collected west of the pond located along the western property boundary of the Site. The MDEQ instructed AECOM field staff to sample this location based on information from the property owner that the tile was there, but that it was submerged.

DR3 had the highest concentration of both PFAS and PFOS and was located in the southwest corner of the Site. AECOM field staff located what appeared to be a PVC pipe. The surface water sample was collected from the point that the pipe (drain tile) entered the Pleasant Lake Drain from the field. The sample could not be collected directly from the pipe due to partial submergence and flow from the pipe could not be confirmed.

DR4 was collected from the northwest corner of the property along Haines Road from a drainage ditch that emptied into the Lake Pleasant Drain. The sample location was not originally proposed, but when the drain tile was discovered, the MDEQ requested that a sample be collected. The drain tile appeared to be a PVC pipe that was completely submerged. The surface water sample was collected from water in the drainage ditch at the location of ripples created by water leaving the pipe.

DR5 was collected east of the driveway from the Lake Pleasant Drain along Haines Road. The sample location was not originally proposed, but when the drain tile was discovered, the MDEQ requested that a sample be collected. The drain tile appeared to be a PVC pipe that was completely submerged. The surface water sample was collected from the Pleasant Lake Drain at the location of ripples created by water leaving the pipe.

Pleasant-01 was collected by MDEQ staff at the inlet to Lake Pleasant.

Pleasant-02 was collected by MDEQ staff from the center of Lake Pleasant.

8. QA/QC Results

Laboratory reports 1800898 and 1800937 (**Appendix D**) were subjected to data validation per the Lapeer WWTP Biosolids Sites QAPP. The reports were evaluated for data completeness, holding times and sample preservation, initial and continuing calibration, method and field blanks, ongoing precision and recovery, field duplicate precision, extracted internal standard recoveries, and reporting issues. All quality control acceptance limits and criteria specified in the QAPP were met or qualification of the data was not required, with the exception of some exceedances for extracted internal standard recovery which were qualified as estimated.

All results in other PFAS laboratory reports were evaluated to determine if any result values should be rejected based on major quality control problems. No results were rejected based on this evaluation.

Data validation memos are presented in **Appendix D**.

9. Investigation-Derived Waste (IDW)

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

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

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

10. Pathway and Receptors Evaluation

An exposure pathway includes five components: source of contamination; environmental media and transport mechanism; 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 standards or soil screening values.

Potentially complete groundwater exposure pathways associated with the Site and corresponding Part 201 cleanup criteria are:

- Drinking Water criteria (DWC) (PFOA and PFOS 70 ppt), and
- Groundwater surface water interface (GSI; Part 31 Water Quality Values) (PFOA 12 ppb and PFOS 12 ppt).

Potentially complete surface water exposure pathways associated with the Site and corresponding Part 31 Water Quality Values or other criteria/screening values are:

- Ingestion of surface water incidental to recreational activities (human cancer values and non-cancer values for non-drinking water sources) (PFOA 12 ppb and PFOS 12 ppt),
- Ingestion of fish (human cancer values and non-cancer values for non-drinking water sources) (PFOA 12 ppb PFOS 12 ppt), and
- Aquatic life exposures (aquatic chronic values (PFOA 880 ppb and PFOS 140 ppb) and final acute values (PFOA 15,000 ppb PFOS 1,600 ppb).

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

- Direct Contact Criteria (DCC; criteria not available);
- Particulate Soil Inhalation Criteria (PSIC; criteria not available);

- Soil protection of groundwater for drinking water (DWPC; proposed criteria PFOS 1.4 ppb and PFOA 59 ppb);
- Soil protection for the groundwater surface water interface (GSIPC; PFOA 10,000 ppb and PFOS 240 ppt), and
- 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 river and other impacted surface waters for recreation and fishing, and
- Fish and other aquatic life.

Potential receptors associated with soil are:

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

Groundwater Evaluation

Groundwater receptors from WWTP biosolids include at least 26 private/household wells and 1 Type I well as identified within a ½-mile radius (**Figure 10**) using the MDEQ Wellogic data base. The MDEQ Wellogic database does not include all of the well records; however, a review of additional scanned well logs was also performed. Based upon the results of this investigation, there is no unacceptable risk based on the Part 201 drinking water criteria since all groundwater samples are below criteria. In addition, groundwater samples collected as part of the MDEQ's Statewide Public Water Supply Sampling Program from community water supplies, including the Type I well previously described, and public schools identified near the biosolid application sites were nondetect for PFAS.

Surface Water Evaluation

PFAS concentrations were detected in the surface water samples with three locations exceeding the Part 31 Water Quality Value for PFOS. However, no exceedances of the Part 31 final chronic and final acute values for protection of aquatic life were detected. Based on the Part 31 exceedance there is the potential for exposure to PFAS from ingestion of PFAS-impacted fish due to bioaccumulation of PFOS in fish tissue.

MDEQ staff collected nine largemouth bass, four bluegill, and six pumpkinseed fish tissue samples from Lake Pleasant as shown in the graphs of fish length versus PFOS concentration in **Figure 11** and **Figure 12**, respectively. The bluegill and pumpkinseed fish tissue samples were analyzed for mercury and PFAS (the two species are generally treated as one for advisory purposes).

The 95% upper confidence level (UCL) for largemouth bass data is 65 ppb which puts the recommended fish consumption to 2 meals per month. The 95% UCL for the bluegill/pumpkinseed data is 30 ppb causing a consumption advisory of 4 meals per month while the 95% UCL for mercury in the samples was 70 ppb which would cause a consumption advisory of 12 meals per month. The advisory due to PFOS is more restrictive than the statewide advisory of 8 meals per month due to mercury for these species. As a result, a revised fish advisory for PFOS will likely be issued for Lake Pleasant in the future. **Figure 13** and **Figure 14** are box and whisker plots of PFOS concentration detected in largemouth bass and bluegill/pumpkinseeds, respectively, from selected lakes in Michigan indicating that PFOS levels in Lake Pleasant fish are above what would be considered background concentrations.

Surface Soil Evaluation

On-site farm workers may encounter surface soil impacted with PFAS; however no Part 201 direct contact criteria has been established for PFOS and PFOA. All of the surface soil samples exceeded the Part 201 GSI Protection Criterion for PFOS and eight of the samples exceeded the proposed Part 201 DWPC, indicating a potential of PFOS concentrations to leach into groundwater at levels that exceed the Part 31 Water Quality Value and the Part 201 DWC for PFOS and PFOA. One of the groundwater samples (TMW5) exceeded Part 31 Water Quality Value in groundwater; however no exceedances of the Part 201 DWC in groundwater were detected. The data indicate that there is a potential for PFAS-impacted soil to leach to groundwater at concentrations that could exceed the Part 31 Water Quality Values if the groundwater were to discharge to a surface water body.

PFAS has been documented to transfer to various plants. Depending on the plant type and individual PFAS, the accumulation of PFAS is not evenly distributed throughout the major components of the plant. Some of the PFAS will accumulate more in the roots while others will accumulate in the leaves and fruit. However, there is the possibility of exposure to PFAS via plant uptake through direct or indirect ingestion of PFAS-impacted plants. Currently there are no PFAS criteria for plants; however, a consumption advisory could be developed in the future similar to those for fish.

11. Summary and Discussion

PFAS was detected in all three surface soil samples in each of the three DUs (**Figure 4** and **Figure 5**), all of the six groundwater samples (**Figure 6** and **Figure 7**), all eight surface water locations (**Figure 9** and **Figure 10**). The following Part 201 Criteria and Part 31 Water Quality Values were exceeded:

- GSI protection criterion for PFOS for each of the nine soil samples;
- Part 31 Water Quality Value for PFOS in one groundwater sample; and
- Part 31 Water Quality Values for three surface water samples.

The low PFAS concentrations detected in the temporary monitoring well groundwater samples are likely related to the shallow lithology at the Site, generally sand. PFAS are known to adsorb more strongly to fine particles such as silt and clay. The highest PFAS concentrations observed in soil (DU1) correlated to the highest TOC values, although both the PFAS and TOC concentrations were relatively low. These observations suggest that Site soils have not readily adsorbed PFAS and will generally leach PFAS at low concentrations. If additional groundwater samples were collected, PFAS groundwater concentrations would continue to be low (i.e. likely below Part 201 drinking water criteria) due to the primarily shallow sand lithology at the Site. However, exceedances of the Part 31 Water Quality Value for PFOS (12 ppt) are possible since the value is lower than the drinking water criteria (70 ppt).

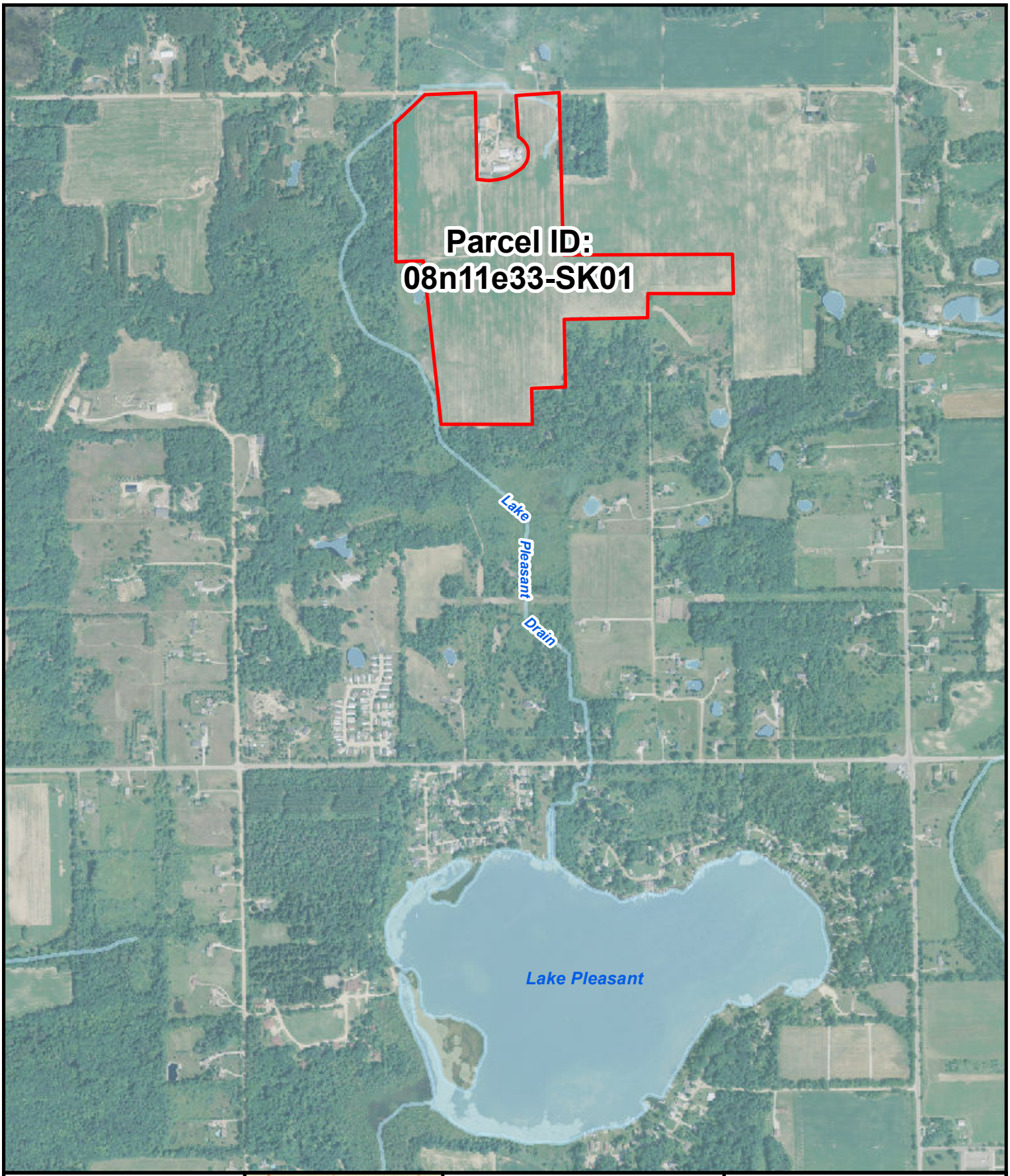
Based on the review of well records near the Site, the residential wells are screened at depths between 75 and 400 feet bgs, with most wells screened below 200 feet. There is clay that overlies the well screens that has a thickness generally in excess of 70 feet. The shallowest residential well, 75 feet bgs, has over 50 feet of clay above its well screen. The PFAS results from the temporary monitoring well samples suggest that Part 31 Water Quality Value exceedances are limited to the shallow, groundwater aquifer. Given that the residential well locations have well screens that are deep in the aquifer with significant overlying clay and the current groundwater sample results, there is no indication that the residential wells near the Site would be at risk of PFAS contamination. In addition, groundwater samples collected from community water supplies and public schools near the biosolids application sites were nondetect for PFAS.

Elevated PFAS surface water concentrations, especially at the downstream (southwest) corner of the Site, are likely related to a combination of surface runoff and discharge of shallow groundwater into the drain tiles and the Lake Pleasant Drain. The southwest portion of the Site is dominated by the Chelsea loamy sand with the Carlisle muck located adjacent to the Lake Pleasant Drain which flows into Lake

Pleasant, approximately 3,400 feet south of the Site. The potential for ingestion of PFAS-impacted fish was identified and PFAS was subsequently detected in the tissue of largemouth bass, bluegill, and pumpkinseed collected from Lake Pleasant. Lake Pleasant is currently not under a PFAS fish advisory but an advisory will likely be placed on the Lake in the future based on recent fish results. A PFAS fish advisory for several fish species is currently in place for the South Branch of the Flint River. The surface water concentrations did not exceed the Part 31 Final Acute Value (FAV) and Final Chronic Value (FCV).

A direct contact exposure risk was not identified at the Site. However, the surface water and groundwater was found to be impacted due to PFAS leaching from the surface soils. Uptake of PFAS to various crops is also possible, but an ingestion criteria for plants has not been established. Ecological screening levels are not available for soil or sediments.

Figures



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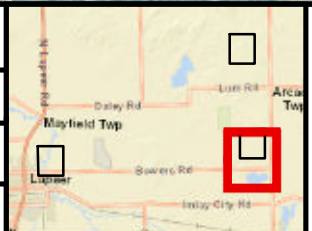

Legend

Site Location

Surface Water

0 480 960 Feet

N

FIGURE 1
08n11e33-SK01
SITE LOCATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

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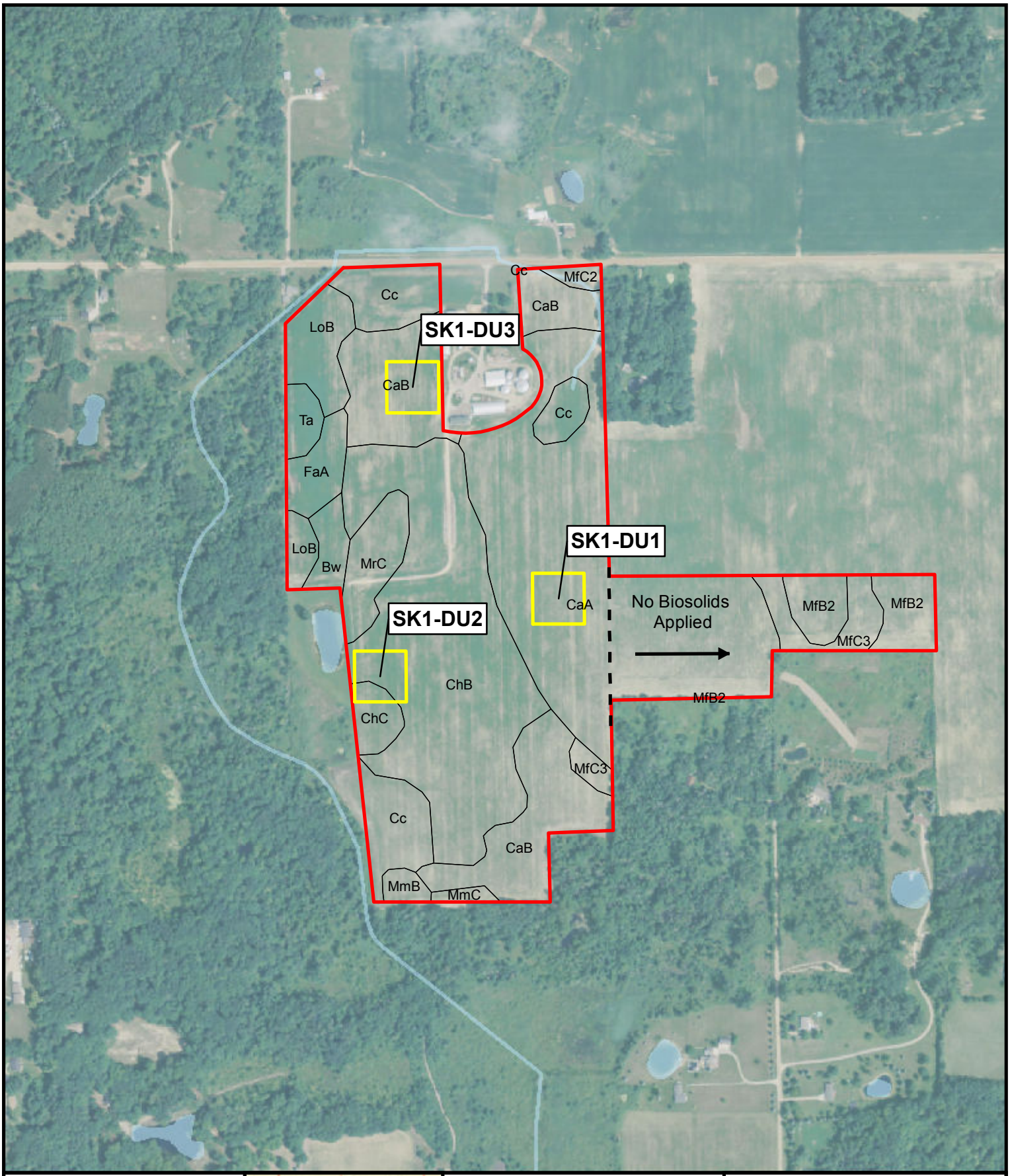

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Project #:	60570635

Legend

- Site Location
- Incremental Soil Sample Area
- Soil Series
- Surface Water

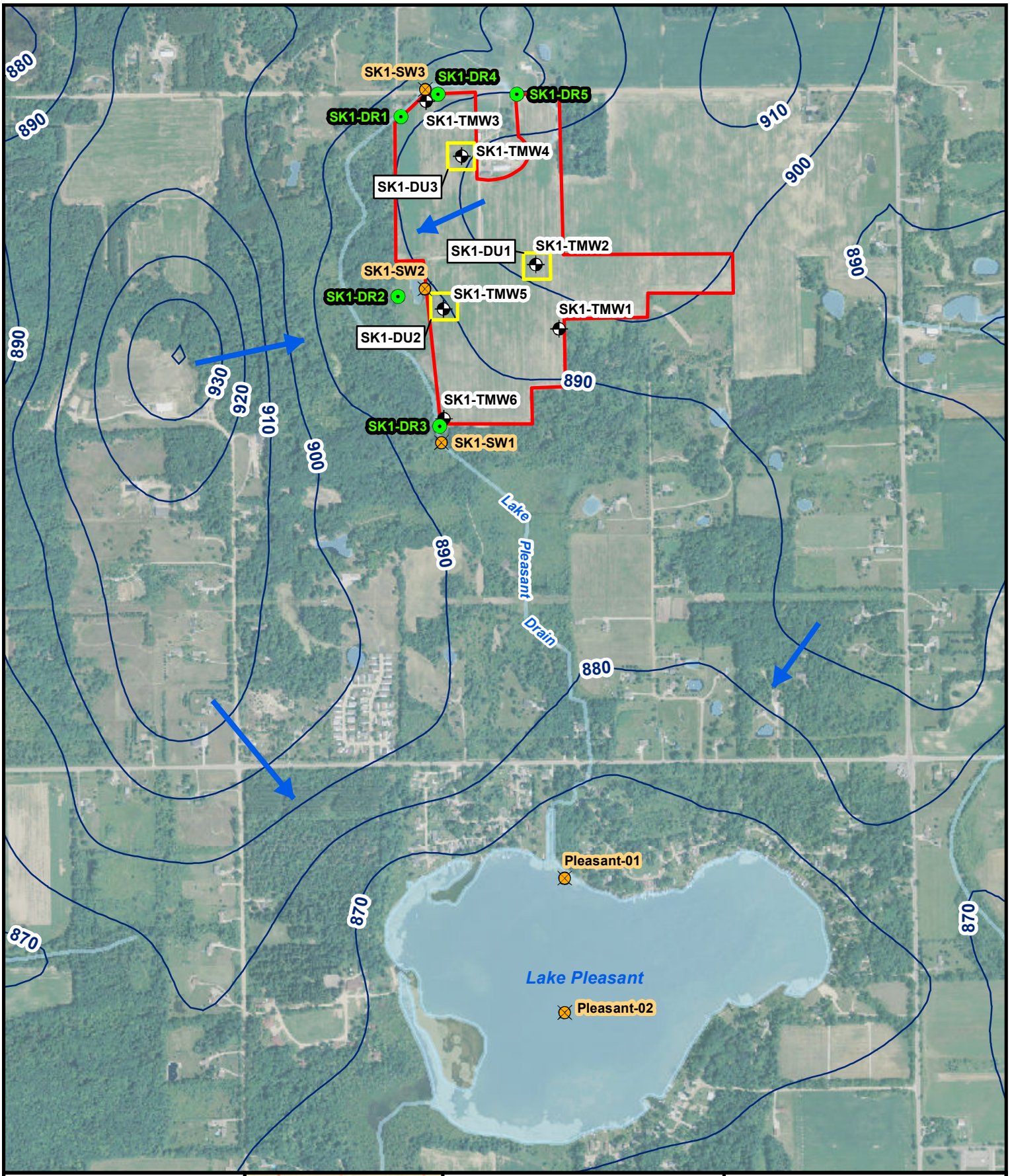
0 250 500 Feet

N

FIGURE 2
08n11e33-SK01
INCREMENTAL SOIL
SAMPLING LOCATIONS

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Incremental_soil_sampling\F3_SK01_Incremental_soil_sampling.mxd



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Legend

- Drain Sample
- Surface Water Sample
- Temporary Monitoring Well Sample
- Groundwater Contour Source: MDEQ
- Site Location
- Incremental Soil Sample Area
- Surface Water
- Groundwater Flow Direction
- 900 GW Elevation (ft above mean sea level)

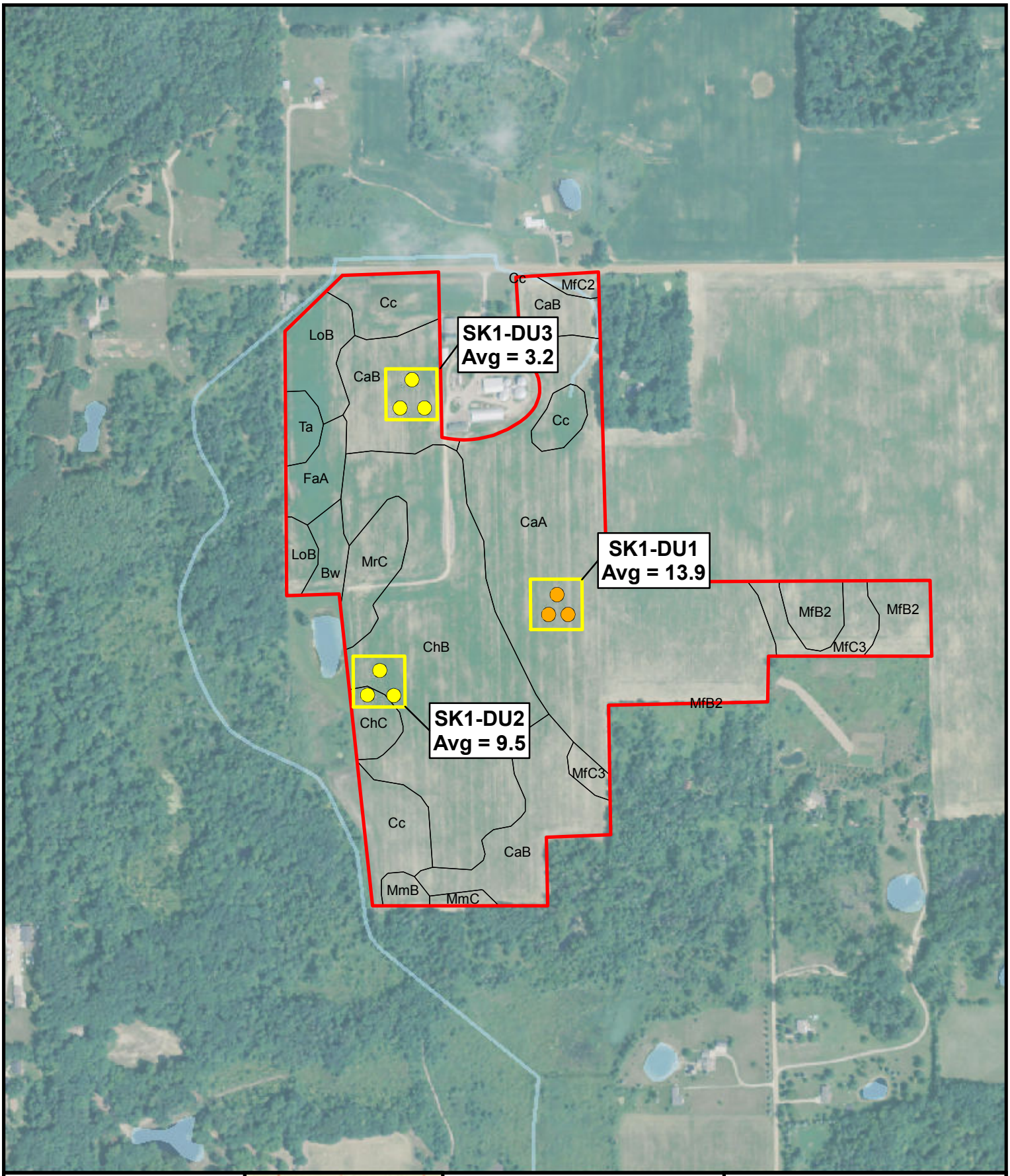
0 490 980 Feet

N

FIGURE 3
08n11e33-SK01
GROUNDWATER, SURFACE WATER & DRAIN TILE SAMPLING LOCATIONS

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Groundwater_sampling\Figure_4b_SK01_groundwater_surface_water_LakePleasant.mxd



AECOM

Drawn:	Date: 7/17/2018
Approved:	Date: 7/17/2018
Project #:	60570635

Sampling Results

Total PFAS (ng/g or parts per billion - ppb)

- ND
- >0 - 10
- >10 - 100
- >100 - 2100
- >2100

Site Location

Incremental Soil Sample Area (Average Total PFAS Concentration)

Soil Series

0 250 500 Feet

N

FIGURE 4
08n11e33-SK01
INCREMENTAL SOIL SAMPLING
TOTAL PFAS CONCENTRATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

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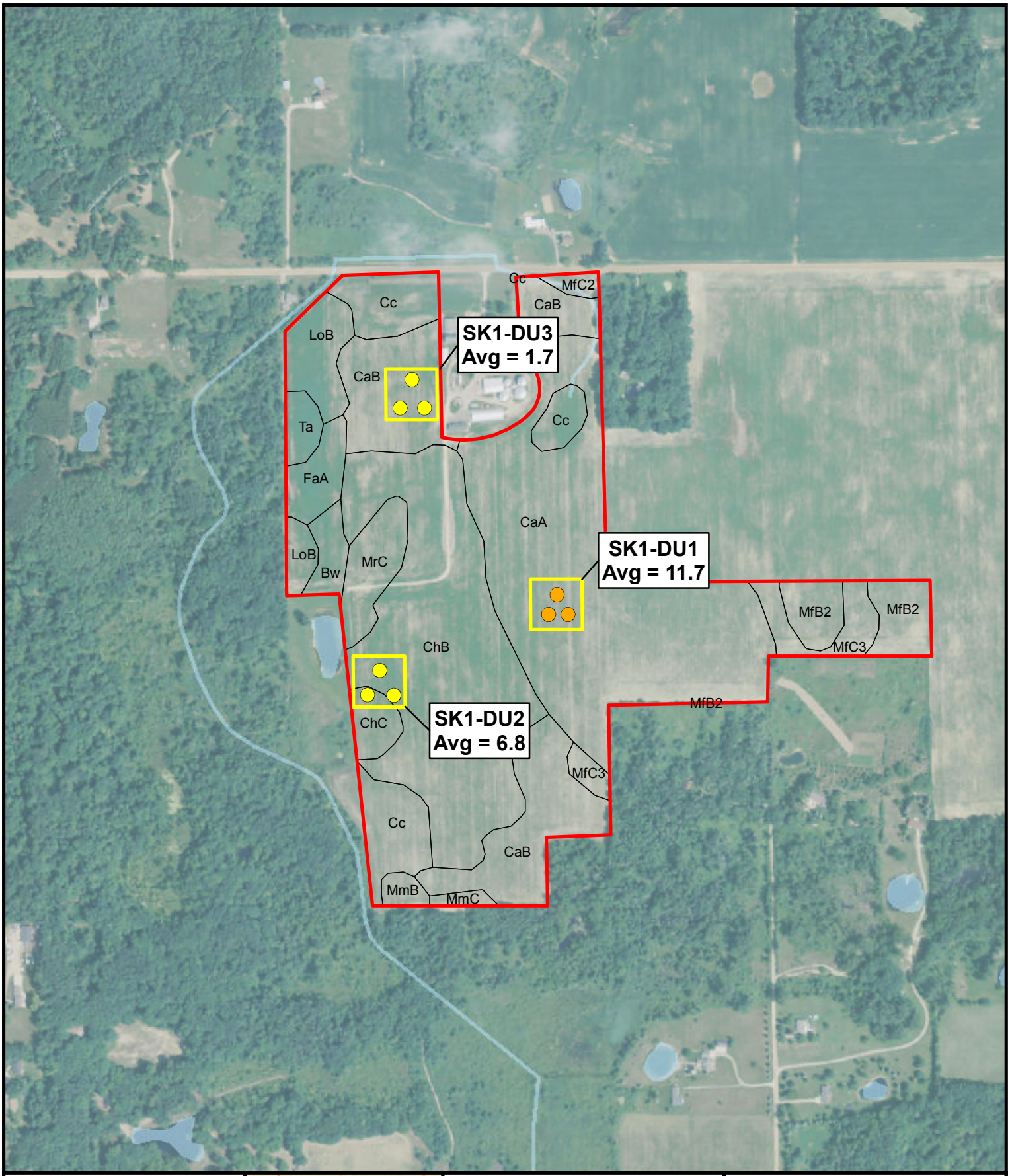


AECOM

Drawn:	Date: 7/17/2018
Approved:	Date: 7/17/2018
Project #:	60570635

Sampling Results
PFOS (ng/g or parts per billion - ppb)

- ND
- >0 - 10
- >10 - 100
- >100 - 2100
- >2100

- Site Location
- Incremental Soil Sample Area (Average PFOS Concentration)
- Soil Series

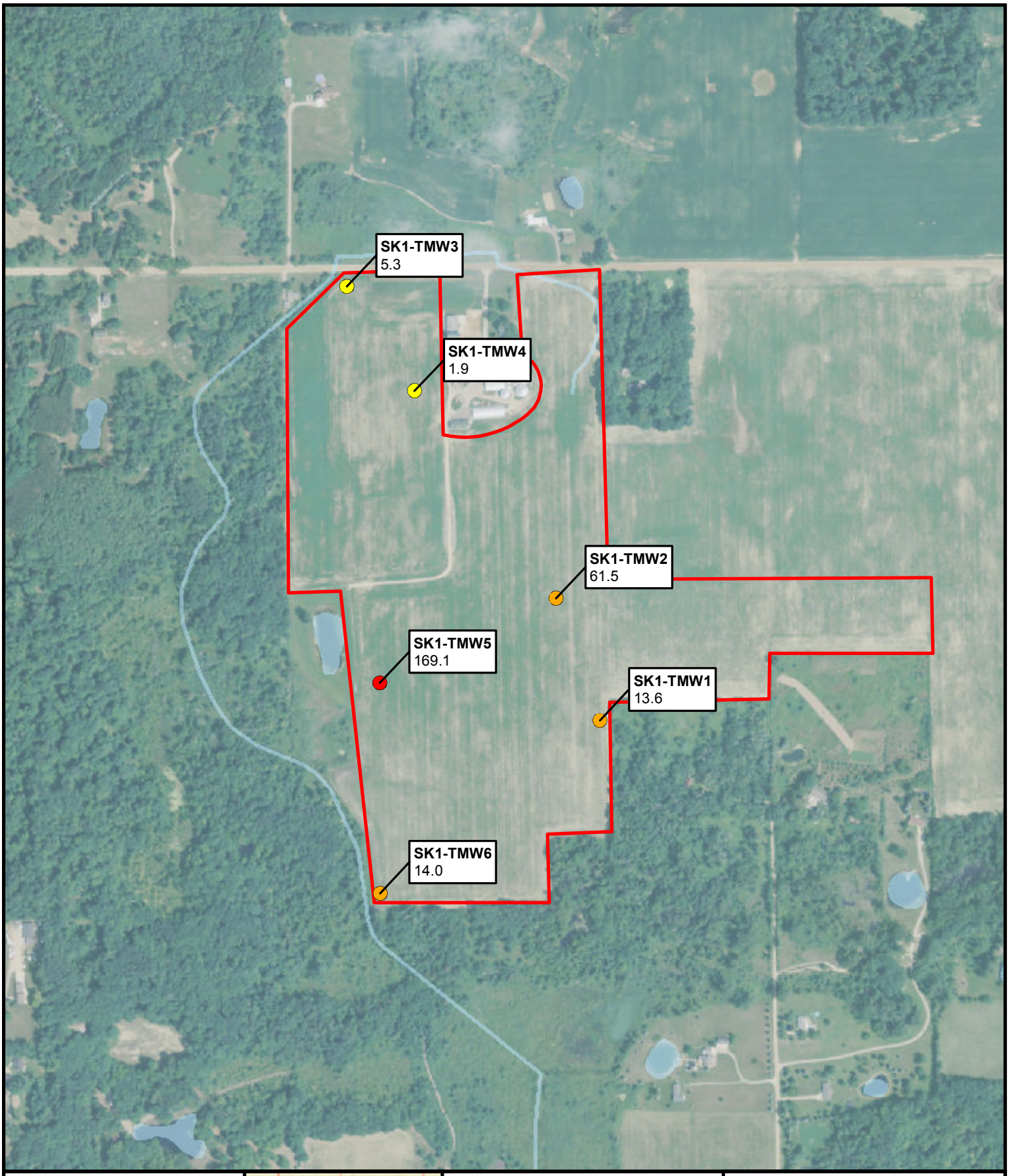
0 250 500 Feet

N

FIGURE 5
08n11e33-SK01
INCREMENTAL SOIL SAMPLING
PFOS CONCENTRATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Heatmaps\Soil\SK01_F6_Incremental_soil_sampling_PFOS_heatmap.mxd



AECOM

Drawn:	Date: 7/18/2018
Approved:	Date: 7/18/2018
Project #:	60570635

Sampling Results
Total PFAS (ng/L or ppt)

- ND
- >0 - 10
- >10 - 70
- >70 - 1000
- >1000

Sample Name
Total PFAS

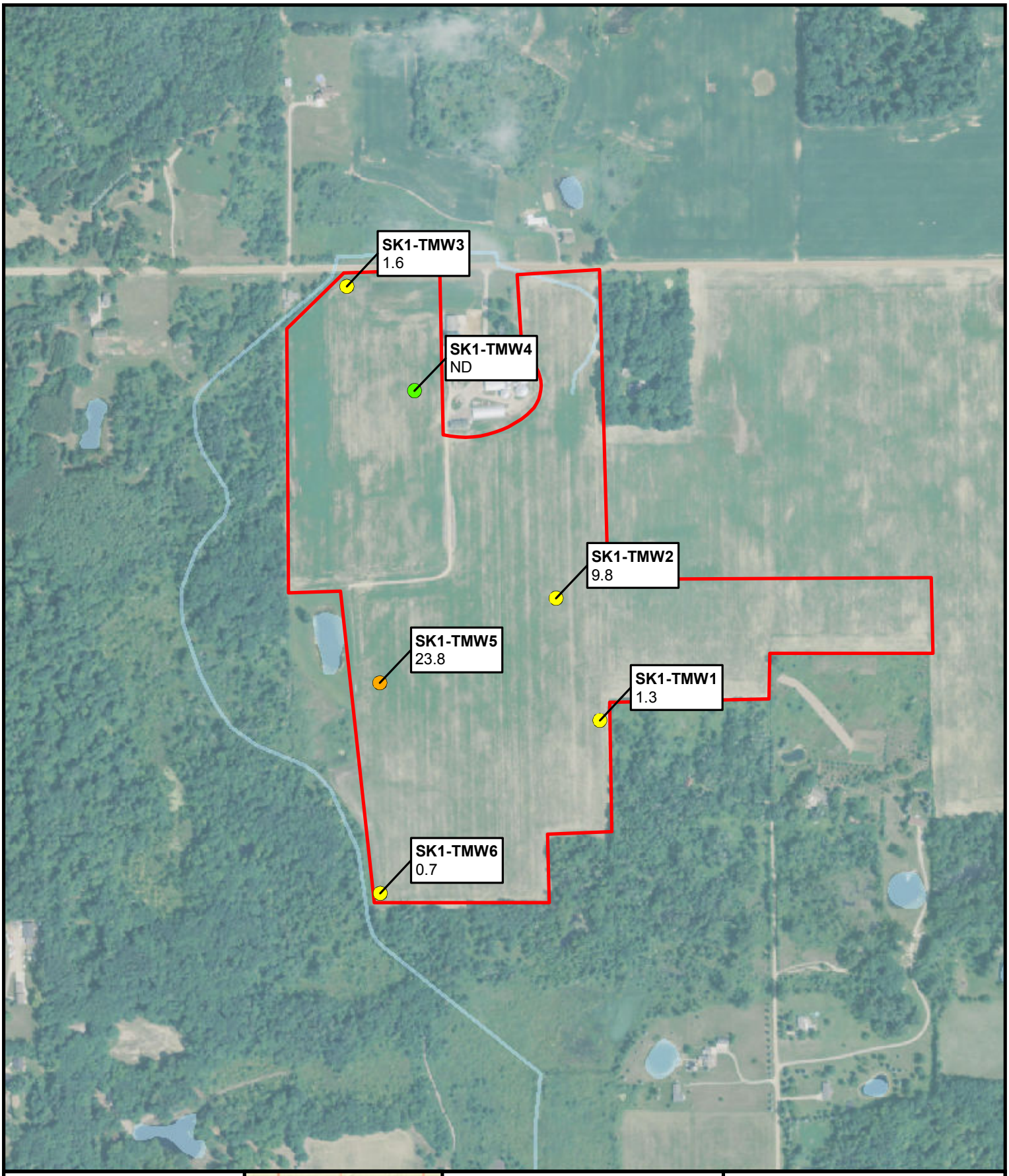
0 260 520 Feet

N

FIGURE 6
08n11e33-SK01
GROUNDWATER TOTAL PFAS CONCENTRATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Heatmaps\GW\SK01_groundwater_totalPFAS_heatmap.mxd



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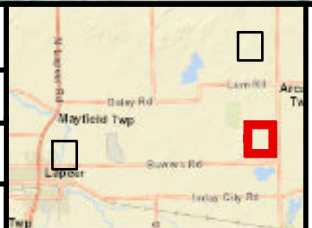

Sampling Results
PFOA + PFOS (ng/L or ppt)

- ND
- >0 - 10
- >10 - 70
- >70 - 1000
- >1000

Sample Name
PFOA+PFOS

0 250 500 Feet

N

FIGURE 7
08n11e33-SK01
GROUNDWATER PFOA + PFOS CONCENTRATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

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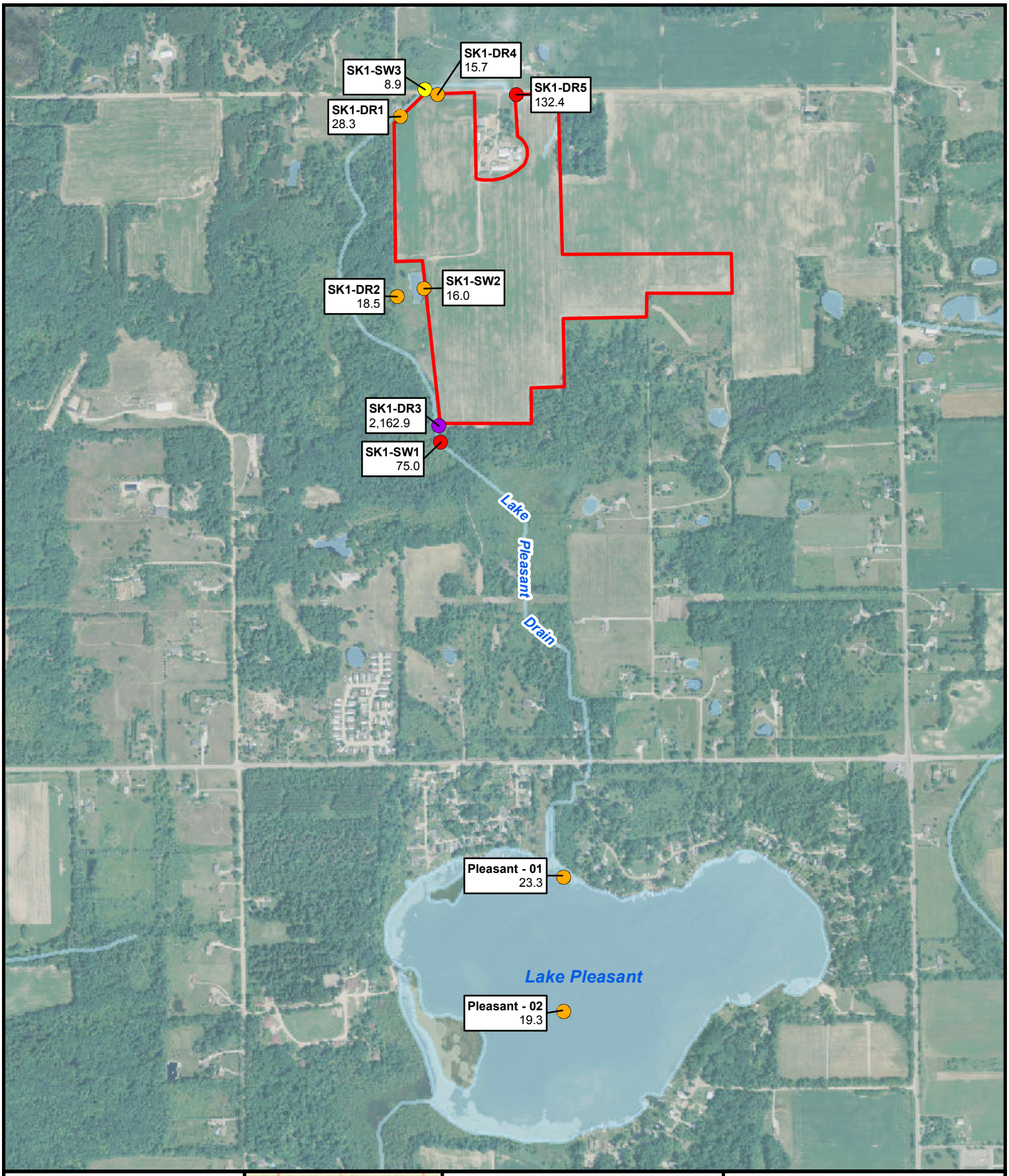

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Project #:	60570635

Sampling Results
Total PFAS (ng/L or ppt)

- ND
- >0 - 12
- >12 - 70
- >70 - 1000
- >1000

Sample Name
Total PFAS

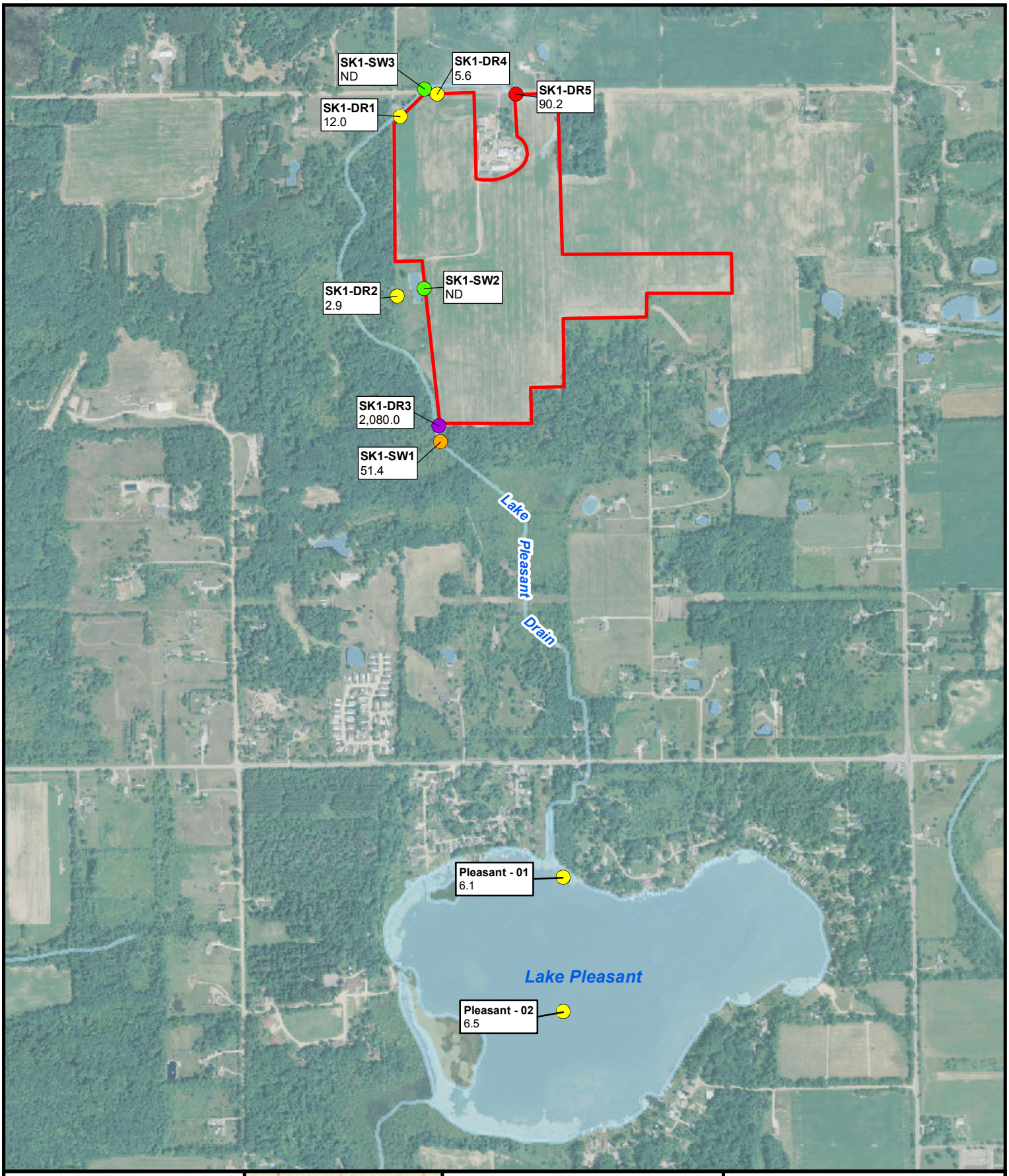
0 475 950 Feet

N

FIGURE 8
08n11e33-SK01
SURFACE WATER & DRAIN TILE
TOTAL PFAS CONCENTRATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Heatmaps\SW\SK01_surface_water_totalPFAS_heatmap_LakePleasant.mxd



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Drawn:	Date: 9/26/2018
Approved:	Date: 9/26/2018
Project #:	60570635

Sampling Results
PFOS (ng/L or ppt)

- ND
- >0 - 12
- >12 - 70
- >70 - 1000
- >1000

Sample Name
PFOS

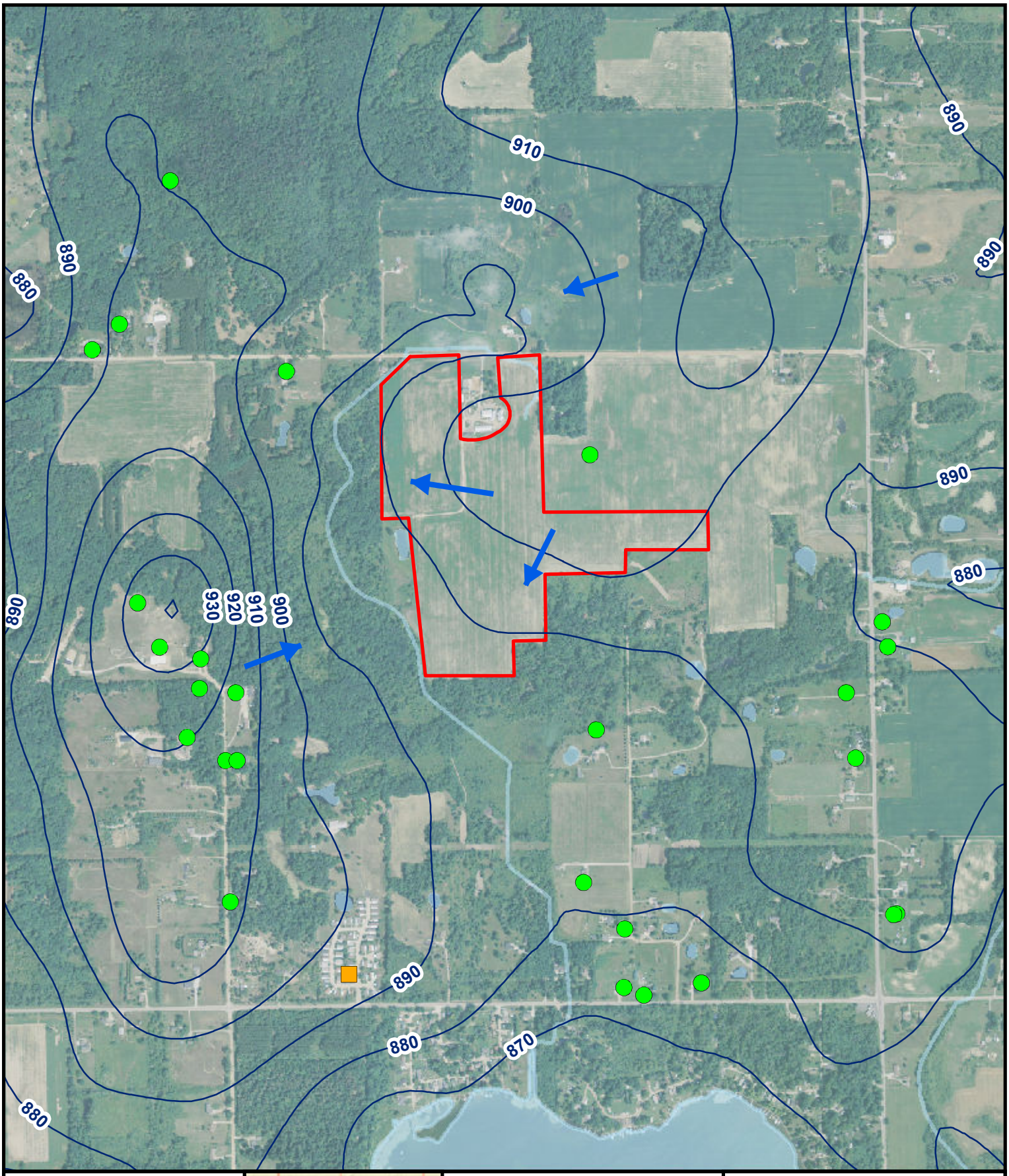
0 480 960 Feet

N

FIGURE 9
08n11e33-SK01
SURFACE WATER & DRAIN TILE
PFOS CONCENTRATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Heatmaps\SW\SK01_surface_water_PFOS_heatmap_LakePleasant.mxd



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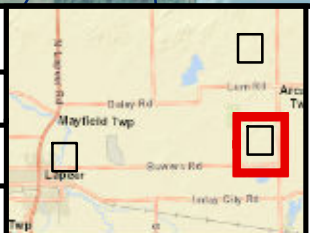

Legend

- Wellogic Well
- Type I Well
- Groundwater Contour Source: MDEQ
- Groundwater Flow Direction
- Site Location
- Surface Water
- 900 GW Elevation (ft above mean sea level)

0 500 1,000 Feet

N

FIGURE 10
08n11e33-SK01
WELLOGIC WELLS & REGIONAL GW FLOW DIRECTION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

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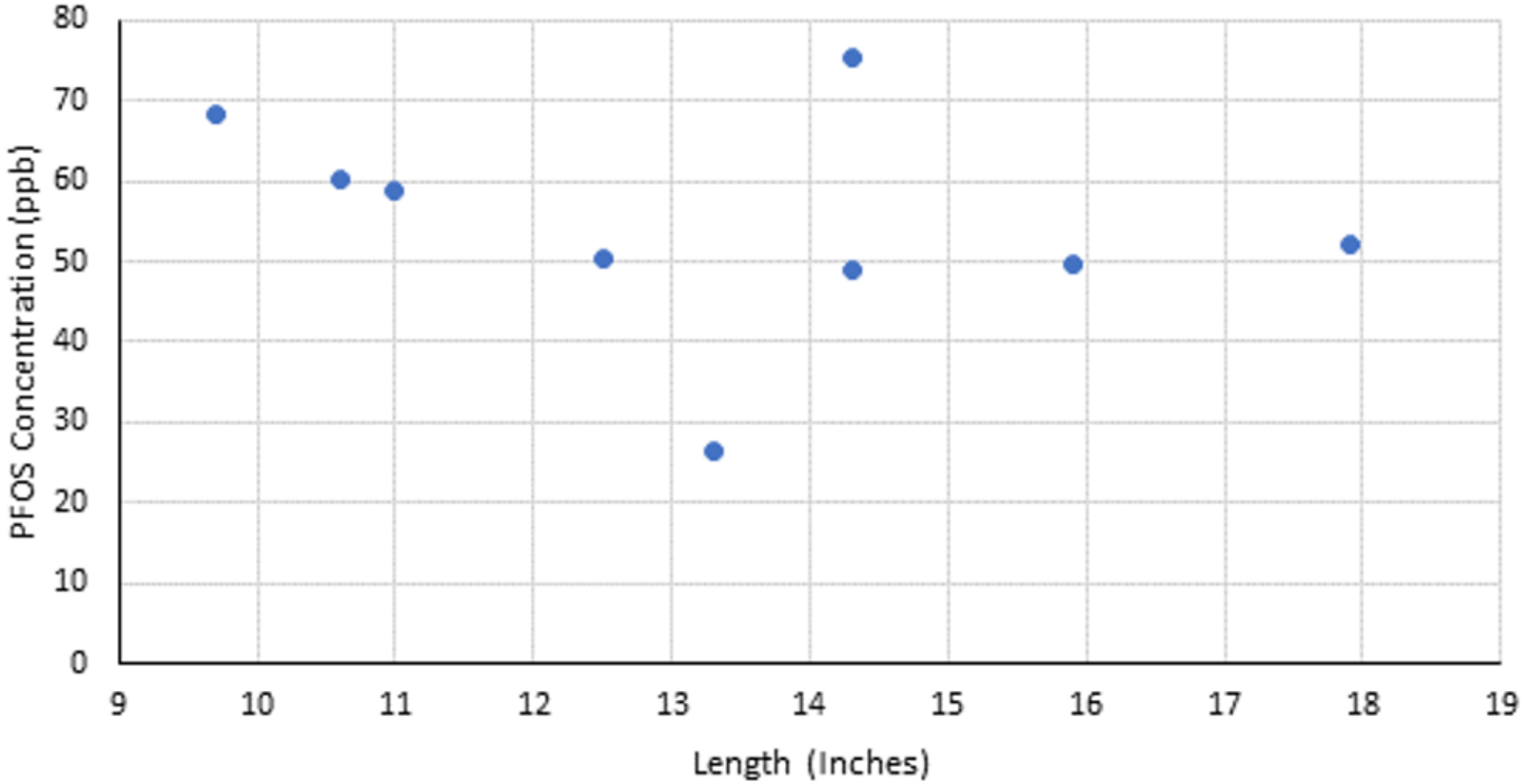

AECOM

Project #: 60570635

Figure 11
08n11e33-SK01
Length of Largemouth Bass vs. PFOS Concentration

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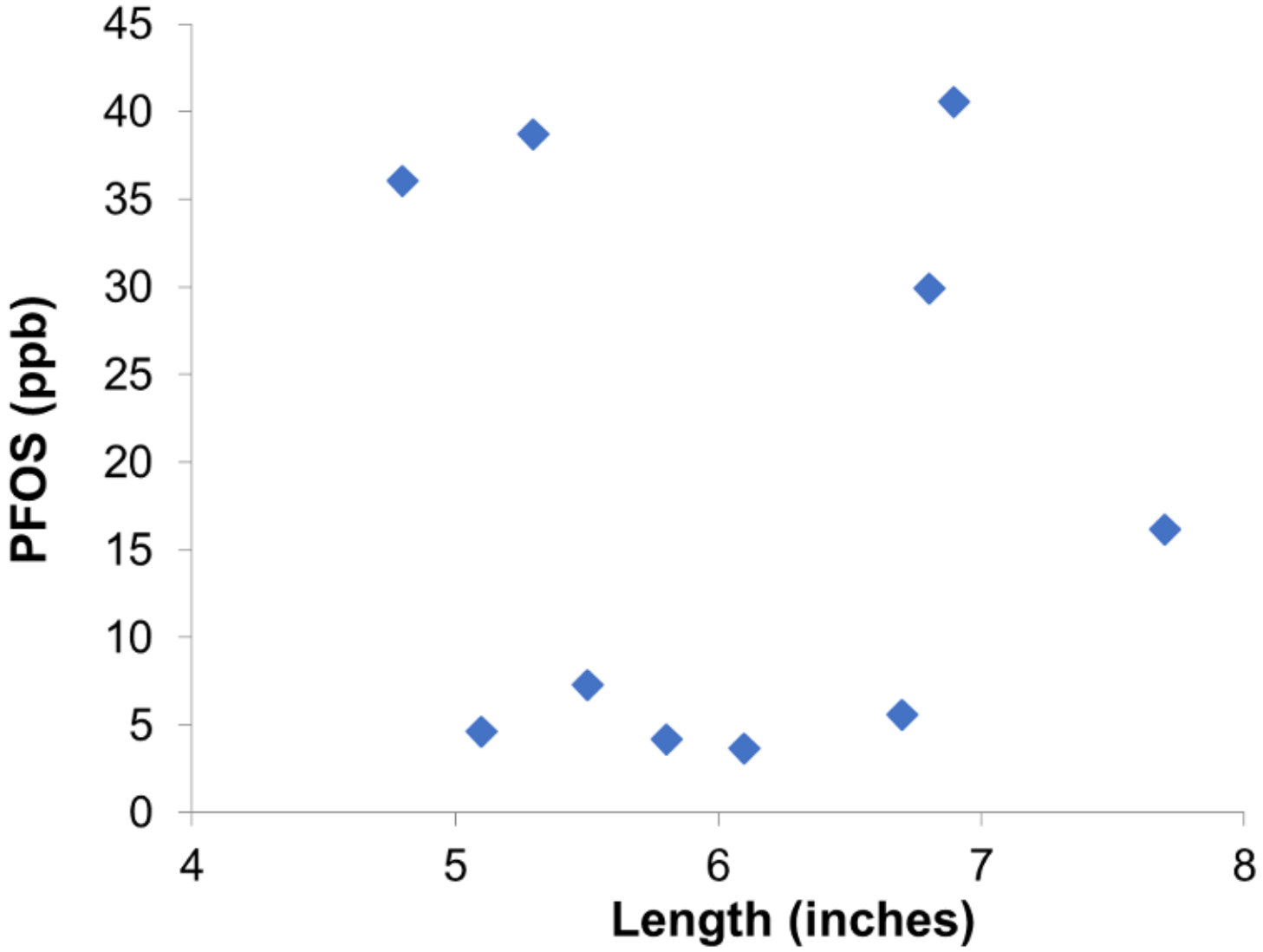

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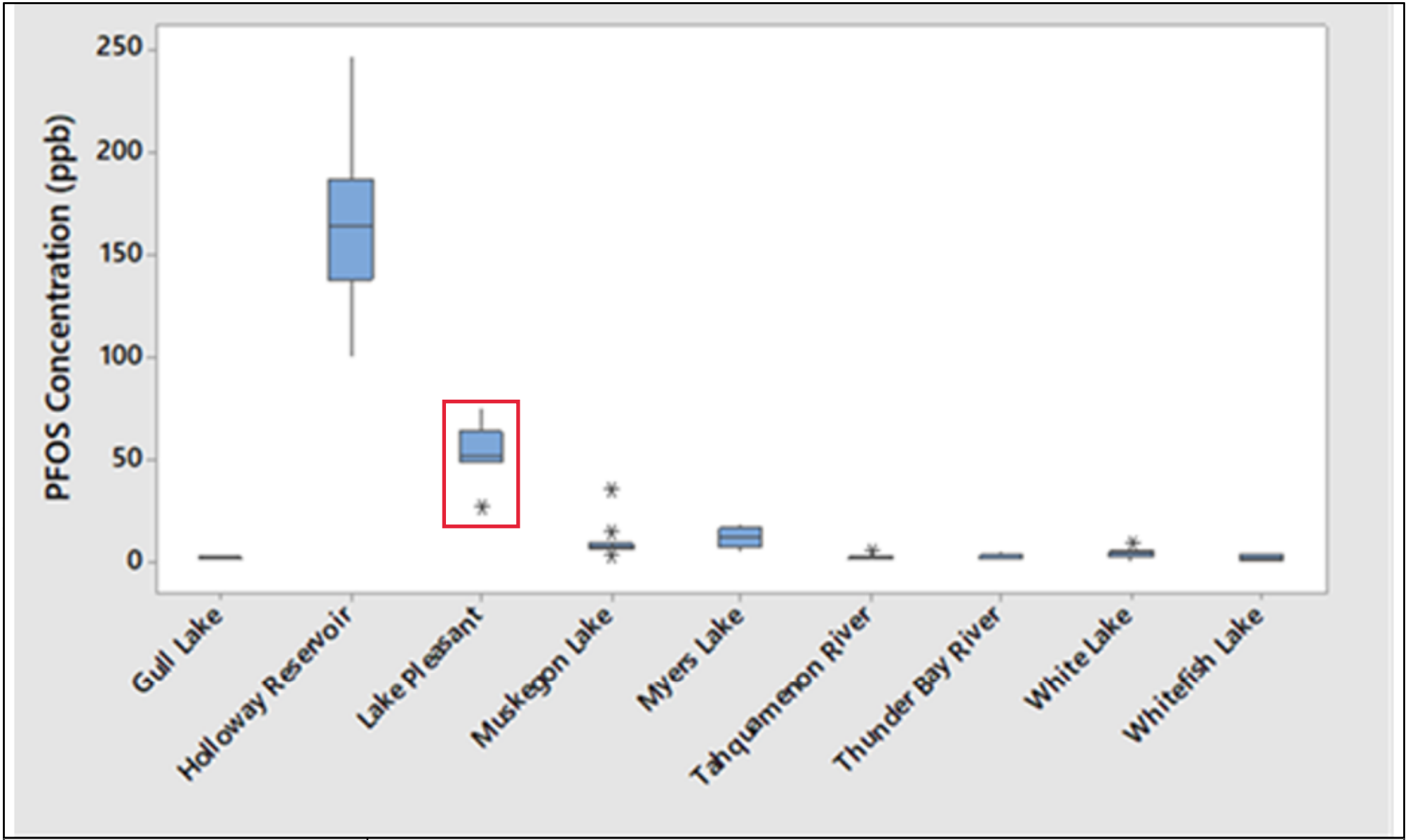
Figure 12
08n11e33-SK01
Length of Bluegill/Pumpkinseed vs. PFOS Concentration

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Fish\Fig_12_Bluegill_Pumpkinseed_scatter.mxd



AECOM

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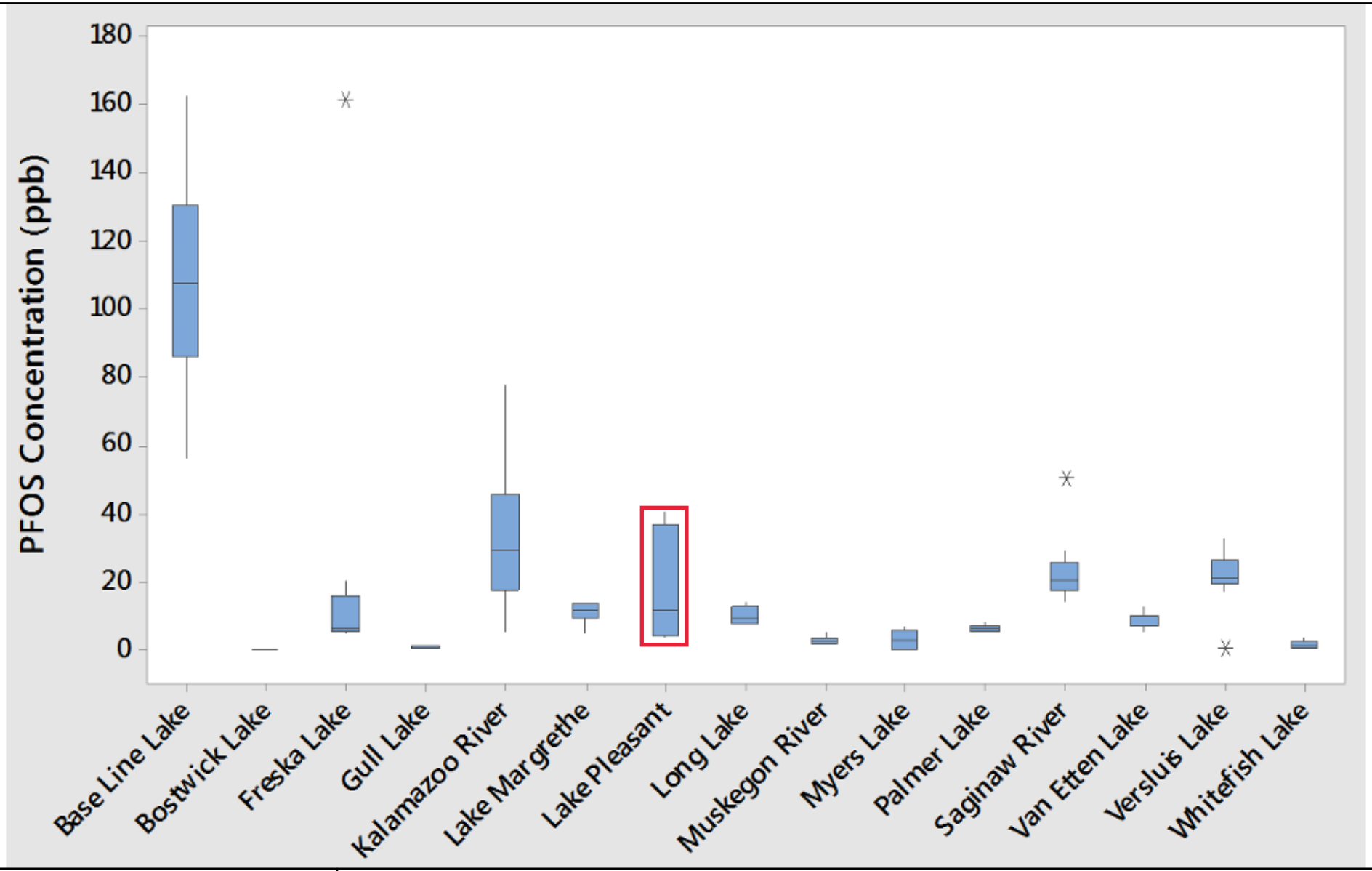
Figure 13
08n11e33-SK01
PFOS Concentration in Laregemouth Bass Tissue Samples from Selected Michigan Waterbodies

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Fish\Fig_13_LargemouthBass_BoxWhisker.mxd



AECOM

Project #: 60570635

Figure 14
08n11e33-SK01
PFOS Concentration in Bluegill/Pumpkinseed Tissue Samples from Selected Michigan Waterbodies

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Fish\Fig_14_Bluegill_Pumpkinseed_BoxWhisker.mxd

Tables

Table 1
Biosolids Application Data
Site 08n11e33-SK01

Annual Report Year	Site ID Number	dT Land Applied	dT/Acre	Acres Used	Acres Approved	Dates of Land Application
2007	08n12e10-SK01	153.12	2.64	58	75	11/22/06, 11/24/06
2004	08n11e27-SK01	164.45	2.99	55	75	10/20/03 - 10/23/03
2001	08n11e33-SK01	193.04	3.04	63.5	75	11/1/00, 11/2/00, 5/9/01, 5/10/01
1998	08n12e07-SK01	73.71	1.89	39	75	11/19/1997
1997	08n11e31-SK02	115.92	3.22	36	75	9/9/1997
	Total dT Applied:	**700.24**				

Notes:
dT = dry tons

Table 2
Parcel ID: 08n11e33-SK01
PFAS Soil Analytical Results Summary

Soil Sample	Sample Date	Depth (ft)	Total PFASs	PFOA + PFOS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFBS	PFPeS	PFHxS	PFHpS	PFNS	PFOS	PFDS	4:2 FTS	6:2 FTS	8:2 FTS	PFOSA	EtFOSAA	MeFOSAA
SK1DU10100180427N	**4/27/2018**	**8"**	**13.97**	**11.30**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11.30**	ND	ND	**2.67**	ND	ND	ND	ND
SK1DU10200180427N	**4/27/2018**	**8"**	**14.01**	**12.50**	ND	ND	ND	ND	ND	ND	**0.27**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12.50**	**0.24**	ND	**1.00**	ND	ND	ND	ND
SK1DU10300180427N	**4/27/2018**	**8"**	**13.57**	**11.40**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11.40**	**0.48**	ND	**1.69**	ND	ND	ND	ND
SK1DU20100180427N	**4/27/2018**	**8"**	**9.39**	**6.56**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**6.56**	**0.87**	ND	**1.96**	ND	ND	ND	ND
SK1DU20200180427N	**4/27/2018**	**8"**	**9.56**	**7.67**	ND	ND	ND	ND	**0.29**	ND	**0.25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.38**	**1.64**	ND	ND	ND	ND	ND	ND
SK1DU20300180427N	**4/27/2018**	**8"**	**9.51**	**6.55**	ND	ND	ND	ND	ND	ND	**0.26**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**6.55**	**1.25**	ND	**1.45**	ND	ND	ND	ND
SK1DU30100180427N	**4/27/2018**	**8"**	**1.89**	**1.37**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.37**	**0.52**	ND	ND	ND	ND	ND	ND
SK1DU30200180427N	**4/27/2018**	**8"**	**5.45**	**2.11**	ND	ND	ND	ND	ND	ND	**0.29**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.11**	**1.63**	ND	**1.42**	ND	ND	ND	ND
SK1DU30300180427N	**4/27/2018**	**8"**	**2.15**	**1.48**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.48**	**0.67**	ND	ND	ND	ND	ND	ND

ND = Non Detect
Concentrations are reported as ng/g or ppb
FB = Field Blank

Bolded values indicate detection

PFBA = Perfluorobutanoic acid
PFPeA = Perfluoropentanoic acid
PFPeS = Perfluoropentane sulfonic acid
PFHxA = Perfluorohexanoic acid
PFHpA = Perfluoroheptanoic acid
PFOA = Perfluorooctanoic acid
PFNA = Perfluorononanoic acid
PFDA = Perfluorodecanoic acid

PFUnDA = Perfluoroundecanoic acid
PFDoDA = Perfluorododecanoic acid
PFTrDA = Perfluorotridecanoic acid
PFTeDA = Perfluorotetradecanoic acid
PFBS = Perfluorobutane sulfonic acid
PFHxS = Perfluorohexane sulfonic acid
PFHpS = Perfluoroheptane sulfonic acid
PFNS = Pefluorononane sulfonic acid

PFOS = Perfluorooctane sulfonic acid
PFDS = Perfluorodecane sulfonic acid
4:2 FTSA = 4:2 Fluorotelomer sulfonic acid
6:2 FTSA = 6:2 Fluorotelomer sulfonic acid
8:2 FTSA = 8:2 Fluorotelomer sulfonic acid
POSA = Perfluorooctane sulfonamide
EtFOSAA - N-Ethyl Perfluorooctane sulfonamindoacetic acid
MeFOSAA = N-Methyl Perfluorooctane sulfonamide

Soil Criteria (ug/kg or ppb):	PFOS	PFOA
Part 201 Generic Residential Groundwater Surface Water Interface Protection Criteria (for soils) (GSIPC)	0.24	10,000
Proposed Drinking Water Protection Criteria (DWPC)	1.4	59

Soil Criteria Exceedances:
Yellow indicates PFAS exceeded GSIPC
Blue indicates PFAS exceeded proposed DWPC
Green indicates PFAS exceeded both proposed DWPC and GSIPC

Table 3
Parcel ID: 08n11e33-SK01
PFAS and TOC Soil Detection Summary

Soil Sample	Sample Date	Depth (ft)	Total PFASs	Total TOC	Soil Survey	Soil Boring
SK1DU10100180427N	4/27/2018	8"	13.97	8,900	CaA	Sand with Gravel
SK1DU10200180427N	4/27/2018	8"	14.01	8,100	CaA	Sand with Gravel
SK1DU10300180427N	4/27/2018	8"	13.57	7,400	CaA	Sand with Gravel
SK1DU20100180427N	4/27/2018	8"	9.39	5,500	ChC/ChB	Sand with Gravel
SK1DU20200180427N	4/27/2018	8"	9.56	6,400	ChC/ChB	Sand with Gravel
SK1DU20300180427N	4/27/2018	8"	9.51	7,300	ChC/ChB	Sand with Gravel
SK1DU30100180427N	4/27/2018	8"	1.89	6,300	CaB	Clayey Sand with Gravel
SK1DU30200180427N	4/27/2018	8"	5.45	7,200	CaB	Clayey Sand with Gravel
SK1DU30300180427N	4/27/2018	8"	2.15	6,500	CaB	Clayey Sand with Gravel

ND = Non Detect
PFAS concentrations are reported as ng/g or ppb
TOC concentrations are reported as mg/Kg or ppb
CaA/CaB - Capac fine sandy loam
ChC/ChB - Chelsea loamy sand

Table 4
Parcel ID: 08n10e33-SK01
Temporary Monitoring Well Construction

WELL ID	Well size / Material	Depth to Water ft BGS	Screen Interval ft BGS
TMW1	1" pvc	11	13-18
TMW2	1" pvc	11	11-16
TMW3	1" pvc	6.5	3-8
TMW4	1" pvc	13	10-15
TMW5	1" pvc	8.5	6-11
TMW6	1" pvc	8	7-12

Footnotes:
BGS = below ground surface
ft = feet
pvc = polyvinyl chloride

Table 5
Parcel ID: 08nn11e33-SK01
Stablized Water Quality Parameters

Well ID	Date	Sample Interval	Time Collected	pH	Cond.	Turbidity	D.O.	Temp	ORP
		ft	24hr	SU	uS/cm	NTU	mg/L	°C	mV
TMW1	**5/1/18**	18	1105	7.44	546	55	4.15	9.5	-60.4
TMW2	**5/1/18**	16	1230	NA	NA	NA	NA	NA	NA
TMW3	**4/30/18**	8	1525	7.14	611	34	8.57	12.8	140.9
TMW4	**4/30/18**	15	1335	7.28	740	194	6.02	9.2	0.7
TMW5	**4/30/18**	11	1710	7.45	430	180	11.45	8.7	118.1
TMW6	**5/1/18**	12	0825	7.17	503	31	0.01	7.3	-176.5

Notes:

ft = Feet

SU = Standard Unit

uS/cm = Microsiemens/centimeter

NTU = Nephelometric Turbidity Units

mg/L = Milligrams/Liter

mV = Millivolt

°C = Degrees Celsius

Cond. = Conductivity

D.O. = Dissolved Oxygen

Temp. = Temperature

ORP = Oxidization-Reduction Potential

NA = Data not available due to well going dry

* Values in this table are the final "Stabilized" parameters

Table 6
Parcel ID: 08n11e33-SK01
PFAS Groundwater Analytical Results Summary

Groundwater Sample	Sample Date	Depth (ft)	Total PFASs	PFOA + PFOS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFBS	PFPeS	PFHxS	PFHpS	PFNS	PFOS	PFDS	4:2 FTS	6:2 FTS	8:2 FTS	PFOSA	EtFOSAA	MeFOSAA
SK1TMW113180501N	**5/1/2018**	**13**	**13.56**	**1.30**	**1.06**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11.20**	ND	ND	ND	ND	**1.30**	ND	ND	ND	ND	ND	ND	ND
SK1TMW218180501N	**5/1/2018**	**18**	**61.52**	**9.80**	**2.33**	**0.94**	ND	**0.48**	ND	ND	ND	ND	ND	ND	ND	**44.90**	ND	**3.07**	ND	ND	**9.80**	ND	ND	ND	ND	ND	ND	ND
SK1TMW308180430N	**4/30/2018**	**8**	**5.25**	**1.55**	**1.63**	ND	ND	ND	**0.62**	ND	ND	ND	ND	ND	ND	**1.05**	ND	ND	ND	ND	**0.93**	ND	ND	**1.02**	ND	ND	ND	ND
SK1TMW410180430N	**4/30/2018**	**10**	**1.91**	**ND**	**0.59**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.32**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SK1TMW506180430N	**4/30/2018**	**6**	**169.12**	**23.78**	**23.70**	**22.30**	**48.80**	**20.80**	**8.58**	ND	ND	ND	ND	ND	ND	**9.97**	**2.27**	**17.50**	ND	ND	**15.20**	ND	ND	ND	ND	ND	ND	ND
SK1TMW606180501N	**5/1/2018**	**6**	**13.96**	**0.65**	**7.86**	ND	ND	ND	**0.65**	ND	ND	ND	ND	ND	ND	**4.76**	ND	**0.69**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND = Non Detect
Concentrations are reported as ng/L or ppt
FB = Field Blank

Bolded values indicate detection

PFBA = Perfluorobutanoic acid
PFPeA = Perfluoropentanoic acid
PFPeS = Perfluoropentane sulfonic acid
PFHxA = Perfluorohexanoic acid
PFHpA = Perfluoroheptanoic acid
PFOA = Perfluorooctanoic acid
PFNA = Perfluorononanoic acid
PFDA = Perfluorodecanoic acid

PFUnDA = Perfluoroundecanoic acid
PFDoDA = Perfluorododecanoic acid
PFTrDA = Perfluorotridecanoic acid
PFTeDA = Perfluorotetradecanoic acid
PFBS = Perfluorobutane sulfonic acid
PFHxS = Perfluorohexane sulfonic acid
PFHpS = Perfluoroheptane sulfonic acid
PFNS = Pefluorononane sulfonic acid

PFOS = Perfluorooctane sulfonic acid
PFDS = Perfluorodecane sulfonic acid
4:2 FTSA = 4:2 Fluorotelomer sulfonic acid
6:2 FTSA = 6:2 Fluorotelomer sulfonic acid
8:2 FTSA = 8:2 Fluorotelomer sulfonic acid
POSA = Perfluorooctane sulfonamide
EtFOSAA - N-Ethyl Perfluorooctane sulfonamindoacetic acid
MeFOSAA = N-Methyl Perfluorooctane sulfonamide

Aqueous Criteria (ng/L or ppt):	PFOS	PFOA
Part 201 Generic Residential Drinking Water Criteria (DWC)	70	70
Part 31 Water Quality Values (non-drinking source) (GSIC)	12	12,000
Part 31 Final Chronic Value (FCV)	140,000	880,000
Part 31 Final Acute Value (FAV)	1,600,000	15,000,000

Aqueous Criteria Exceedances:
Yellow indicates PFAS exceeded DWC
Blue indicates PFAS exceeded GSIC
Green indicates PFAS exceeded both DWC and GSIC
Orange indicates PFAS exceeded FCV
Red indicates PFAS exceeded both FCV and FAV

Table 7
Parcel ID: 08n11e33-SK01
PFAS Surface Water Analytical Results Summary

Surface Water/Drain Tile Sample	Sample Date	Depth (ft)	Total PFASs	PFOA + PFOS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFBS	PFPeS	PFHxS	PFHpS	PFNS	PFOS	PFDS	4:2 FTS	6:2 FTS	8:2 FTS	PFOSA	EtFOSAA	MeFOSAA
SK1SW0100180509N	**5/9/2018**	**surface**	**74.98**	**58.74**	**5.26**	**2.40**	ND	**3.36**	**7.34**	**0.93**	ND	ND	ND	ND	ND	**2.61**	ND	**1.68**	ND	ND	**51.40**	ND	ND	ND	ND	ND	ND	ND
SK1SW0200180509N	**5/9/2018**	**surface**	**16.03**	**0.79**	**6.02**	**1.25**	**1.79**	**1.11**	**0.79**	ND	ND	ND	ND	ND	ND	**3.81**	ND	**1.26**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SK1SW0300180509N	**5/9/2018**	**surface**	**8.93**	**0.60**	**6.07**	**1.44**	ND	**0.82**	**0.60**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SK1DR0100180509N	**5/9/2018**	**surface**	**28.29**	**14.18**	**4.35**	**1.27**	ND	**0.73**	**2.18**	ND	ND	ND	ND	ND	ND	**2.09**	ND	**0.74**	ND	ND	**12.00**	ND	ND	**4.93**	ND	ND	ND	ND
SK1DR0200180509N	**5/9/2018**	**surface**	**18.46**	**3.99**	**5.88**	**1.01**	ND	ND	**1.05**	ND	ND	ND	ND	ND	ND	ND	ND	**1.30**	ND	ND	**2.94**	ND	ND	**6.28**	ND	ND	ND	ND
SK1DR0300180509N	**5/9/2018**	**surface**	**2,162.86**	**2,106.10**	**5.70**	**3.55**	**6.19**	**6.16**	**26.10**	**4.70**	**5.55**	**0.61**	**0.42**	ND	ND	**13.80**	ND	**5.29**	**2.71**	**2.08**	**2,080.00**	ND	ND	ND	ND	ND	ND	ND
SK1DR0400180509N	**5/9/2018**	**surface**	**15.66**	**8.65**	**2.31**	ND	ND	**0.80**	**3.07**	ND	ND	ND	ND	ND	ND	**1.40**	ND	**2.50**	ND	ND	**5.58**	ND	ND	ND	ND	ND	ND	ND
SK1DR0500180509N	**5/9/2018**	**surface**	**132.44**	**98.33**	**3.95**	**2.49**	ND	**3.15**	**8.13**	**0.50**	ND	ND	ND	ND	ND	**11.40**	ND	**2.02**	ND	ND	**90.20**	ND	ND	**10.60**	ND	ND	ND	ND

Lake Pleasant MDEQ Samples

Surface Water Sample	Sample Date	Depth (ft)	Total PFASs	PFOA + PFOS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFBS	PFPeS	PFHxS	PFHpS	PFNS	PFOS	PFDS	4:2 FTS	6:2 FTS	8:2 FTS	PFOSA	EtFOSAA	MeFOSAA
Pleasant-01	**8/1/2018**	**surface**	**23.26**	**9.80**	**5.90**	**1.70**	**2.70**	**1.90**	**3.70**	**0.60**	ND	ND	ND	ND	**1.40**	**2.40**	ND	**0.96**	ND	ND	**6.10**	ND	ND	**7.90**	ND	ND	ND	ND
Pleasant-02	**8/1/2018**	**surface**	**19.30**	**3.60**	**5.80**	**2.00**	**2.80**	**1.80**	**3.60**	**0.69**	ND	ND	ND	ND	ND	**2.20**	ND	**1.10**	ND	ND	**6.50**	ND	ND	**8.20**	ND	ND	ND	ND

ND = Non Detect
Concentrations are reported as ng/L or ppt
FB = Field Blank

Bolded values indicates detection

PFBA = Perfluorobutanoic acid
PFPeA = Perfluoropentanoic acid
PFPeS = Perfluoropentane sulfonic acid
PFHxA = Perfluorohexanoic acid
PFHpA = Perfluoroheptanoic acid
PFOA = Perfluorooctanoic acid
PFNA = Perfluorononanoic acid
PFDA = Perfluorodecanoic acid

PFUnDA = Perfluoroundecanoic acid
PFDoDA = Perfluorododecanoic acid
PFTrDA = Perfluorotridecanoic acid
PFTeDA = Perfluorotetradecanoic acid
PFBS = Perfluorobutane sulfonic acid
PFHxS = Perfluorohexane sulfonic acid
PFHpS = Perfluoroheptane sulfonic acid
PFNS = Pefluorononane sulfonic acid

PFOS = Perfluorooctane sulfonic acid
PFDS = Perfluorodecane sulfonic acid
4:2 FTSA = 4:2 Fluorotelomer sulfonic acid
6:2 FTSA = 6:2 Fluorotelomer sulfonic acid
8:2 FTSA = 8:2 Fluorotelomer sulfonic acid
POSA = Perfluorooctane sulfonamide
EtFOSAA - N-Ethyl Perfluorooctane sulfonamindoacetic acid
MeFOSAA = N-Methyl Perfluorooctane sulfonamide

Aqueous Criteria (ng/L or ppt):	PFOS	PFOA
Part 201 Generic Residential Drinking Water Criteria (DWC)	70	70
Part 31 Water Quality Values (non-drinking source) (GSIC)	12	12,000
Part 31 Final Chronic Value (FCV)	140,000	880,000
Part 31 Final Acute Value (FAV)	1,600,000	15,000,000

Aqueous Criteria Exceedances:
Yellow indicates PFAS exceeded DWC
Blue indicates PFAS exceeded GSIC
Green indicates PFAS exceeded both DWC and GSIC
Orange indicates PFAS exceeded FCV
Red indicates PFAS exceeded both FCV and FAV

Appendix A

FIELD BOREHOLE LOG

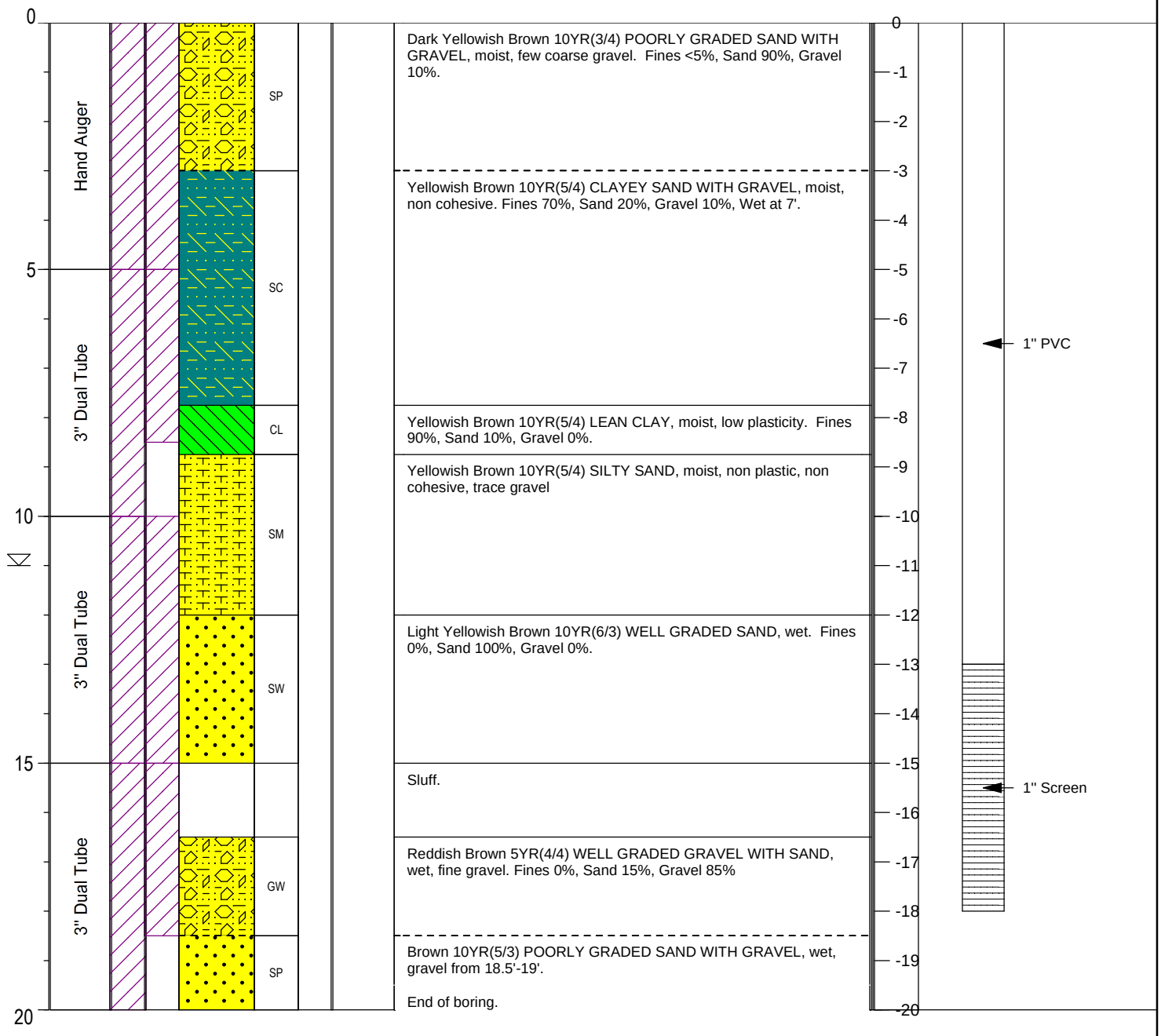
BOREHOLE NO: **SK1-TMW1**
TOTAL DEPTH: **20'**

PROJECT INFORMATION

PROJECT:	**Lapeer Plating**
SITE LOCATION:	**Lapeer, MI**
PROJECT NO.:	**60570635**
PROJECT MANAGER:	**John Cuthbertson**
LOGGED BY:	**Stan Krenz**
CREATED BY:	**Stan Krenz**

DRILLING INFORMATION

CONTRACTOR:	**Job Site Services**
CREW CHIEF:	**Dave Mokma**
DRILL RIG TYPE:	**Geoprobe 7720DT**
DRILLING METHOD:	**3" Dual Tube**
HOLE DIAMETER:	**3.25"**
DATE START:	**5/1/18 0845**
DATE END:	**5/1/18 1110**



NOTES:

Water level during drilling Water level in completed well

FIELD BOREHOLE LOG

BOREHOLE NO: **SK1-TMW1**
TOTAL DEPTH: **20'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	**Lapeer Plating**	CONTRACTOR:	**Job Site Services**
SITE LOCATION:	**Lapeer, MI**	CREW CHIEF:	**Dave Mokma**
PROJECT NO.:	**60570635**	DRILL RIG TYPE:	**Geoprobe 7720DT**
PROJECT MANAGER:	**John Cuthbertson**	DRILLING METHOD:	**3" Dual Tube**
LOGGED BY:	**Stan Krenz**	HOLE DIAMETER:	**3.25"**
CREATED BY:	**Stan Krenz**	DATE START:	**5/1/18 0845**
		DATE END:	**5/1/18 1110**

DEPTH	SAMPLE TYPE	ATTEMPT / RECOVERY	SOIL SYMBOLS	USCS	PID (ppm)	SOIL DESCRIPTION	WELL CONSTRUCTION
20							-20

NOTES:

▽ Water level during drilling ▼ Water level in completed well

FIELD BOREHOLE LOG

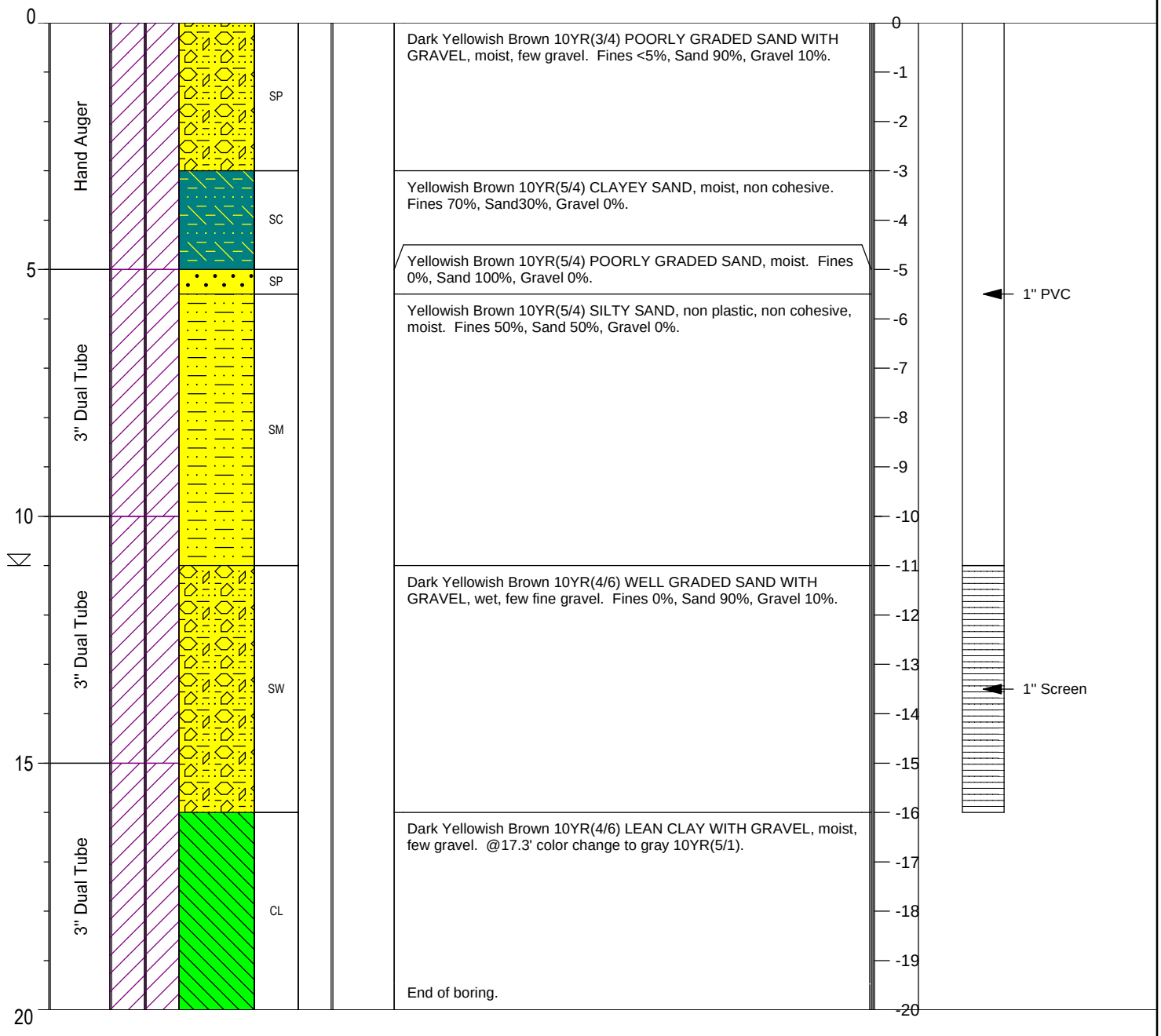
BOREHOLE NO: **SK1-TMW2**
TOTAL DEPTH: **20'**

PROJECT INFORMATION

PROJECT:	**Lapeer Plating**
SITE LOCATION:	**Lapeer, MI**
PROJECT NO.:	**60570635**
PROJECT MANAGER:	**John Cuthbertson**
LOGGED BY:	**Stan Krenz**
CREATED BY:	**Stan Krenz**

DRILLING INFORMATION

CONTRACTOR:	**Job Site Services**
CREW CHIEF:	**Dave Mokma**
DRILL RIG TYPE:	**Geoprobe 7720DT**
DRILLING METHOD:	**3" Dual Tube**
HOLE DIAMETER:	**3.25"**
DATE START:	**5/1/18 1115**
DATE END:	**5/1/18 1235**



NOTES:

Water level during drilling Water level in completed well

FIELD BOREHOLE LOG

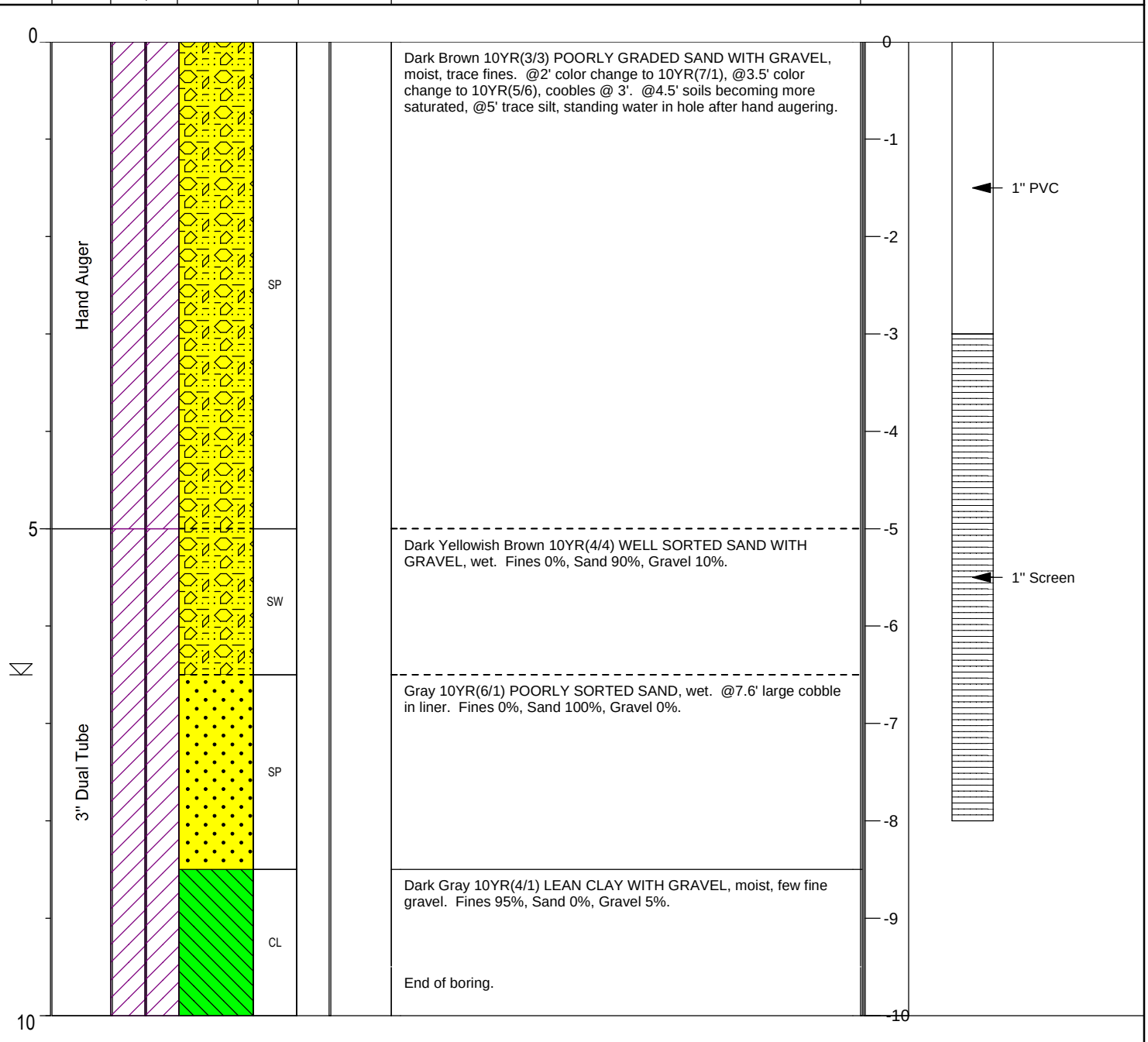
BOREHOLE NO: **SK1-TMW3**
TOTAL DEPTH: **10'**

PROJECT INFORMATION

PROJECT:	**Lapeer Plating**
SITE LOCATION:	**Lapeer, MI**
PROJECT NO.:	**60570635**
PROJECT MANAGER:	**John Cuthbertson**
LOGGED BY:	**Stan Krenz**
CREATED BY:	**Stan Krenz**

DRILLING INFORMATION

CONTRACTOR:	**Job Site Services**
CREW CHIEF:	**Dave Mokma**
DRILL RIG TYPE:	**Geoprobe 7720DT**
DRILLING METHOD:	**3" Dual Tube**
HOLE DIAMETER:	**3.25"**
DATE START:	**4/30/18 1400**
DATE END:	**4/30/18 1535**



NOTES:

Water level during drilling Water level in completed well

FIELD BOREHOLE LOG

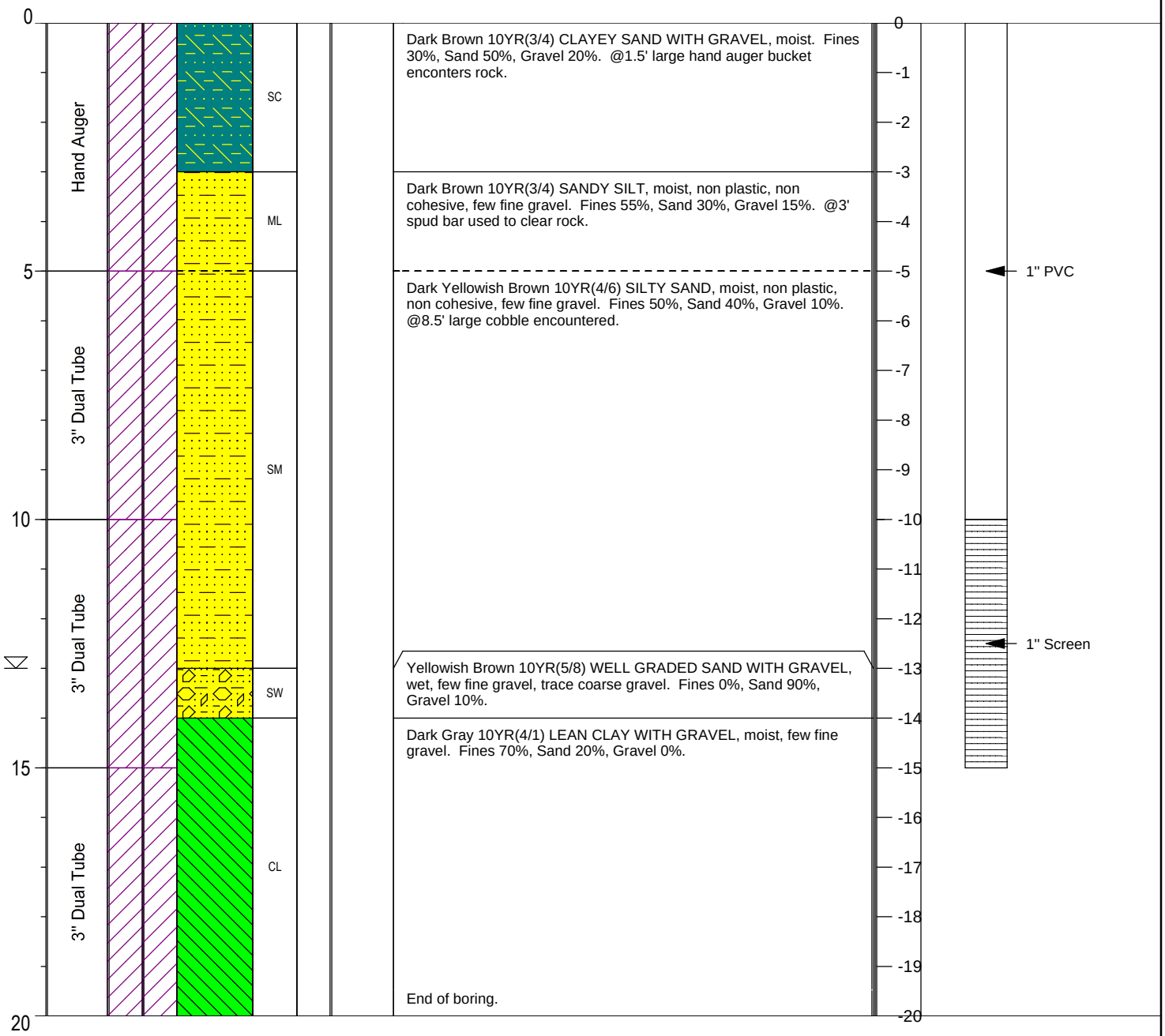
BOREHOLE NO: **SK1-TMW4**
TOTAL DEPTH: **20'**

PROJECT INFORMATION

PROJECT:	**Lapeer Plating**
SITE LOCATION:	**Lapeer, MI**
PROJECT NO.:	**60570635**
PROJECT MANAGER:	**John Cuthbertson**
LOGGED BY:	**Stan Krenz**
CREATED BY:	**Stan Krenz**

DRILLING INFORMATION

CONTRACTOR:	**Job Site Services**
CREW CHIEF:	**Dave Mokma**
DRILL RIG TYPE:	**Geoprobe 7720DT**
DRILLING METHOD:	**3" Dual Tube**
HOLE DIAMETER:	**3.25"**
DATE START:	**4/30/18 1040**
DATE END:	**4/30/18 1350**



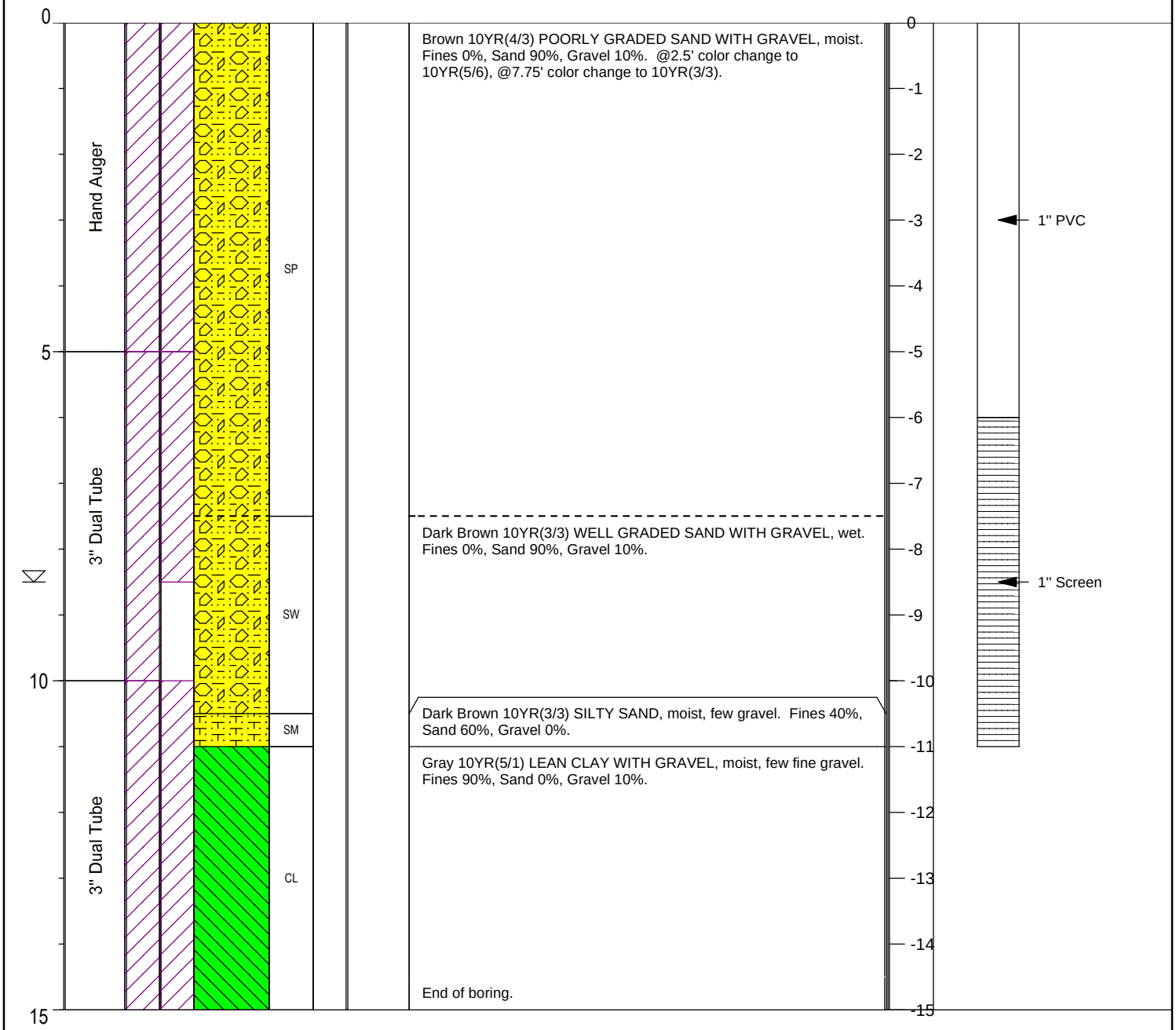
NOTES:

Water level during drilling Water level in completed well

FIELD BOREHOLE LOG

BOREHOLE NO: **SK1-TMW5**
TOTAL DEPTH: **15'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	**Lapeer Plating**	CONTRACTOR:	**Job Site Services**
SITE LOCATION:	**Lapeer, MI**	CREW CHIEF:	**Dave Mokma**
PROJECT NO.:	**60570635**	DRILL RIG TYPE:	**Geoprobe 7720DT**
PROJECT MANAGER:	**John Cuthbertson**	DRILLING METHOD:	**3" Dual Tube**
LOGGED BY:	**Stan Krenz**	HOLE DIAMETER:	**3.25"**
CREATED BY:	**Stan Krenz**	DATE START:	**4/30/18 1600**
		DATE END:	**4/30/18 1715**



NOTES:

Water level during drilling Water level in completed well

FIELD BOREHOLE LOG

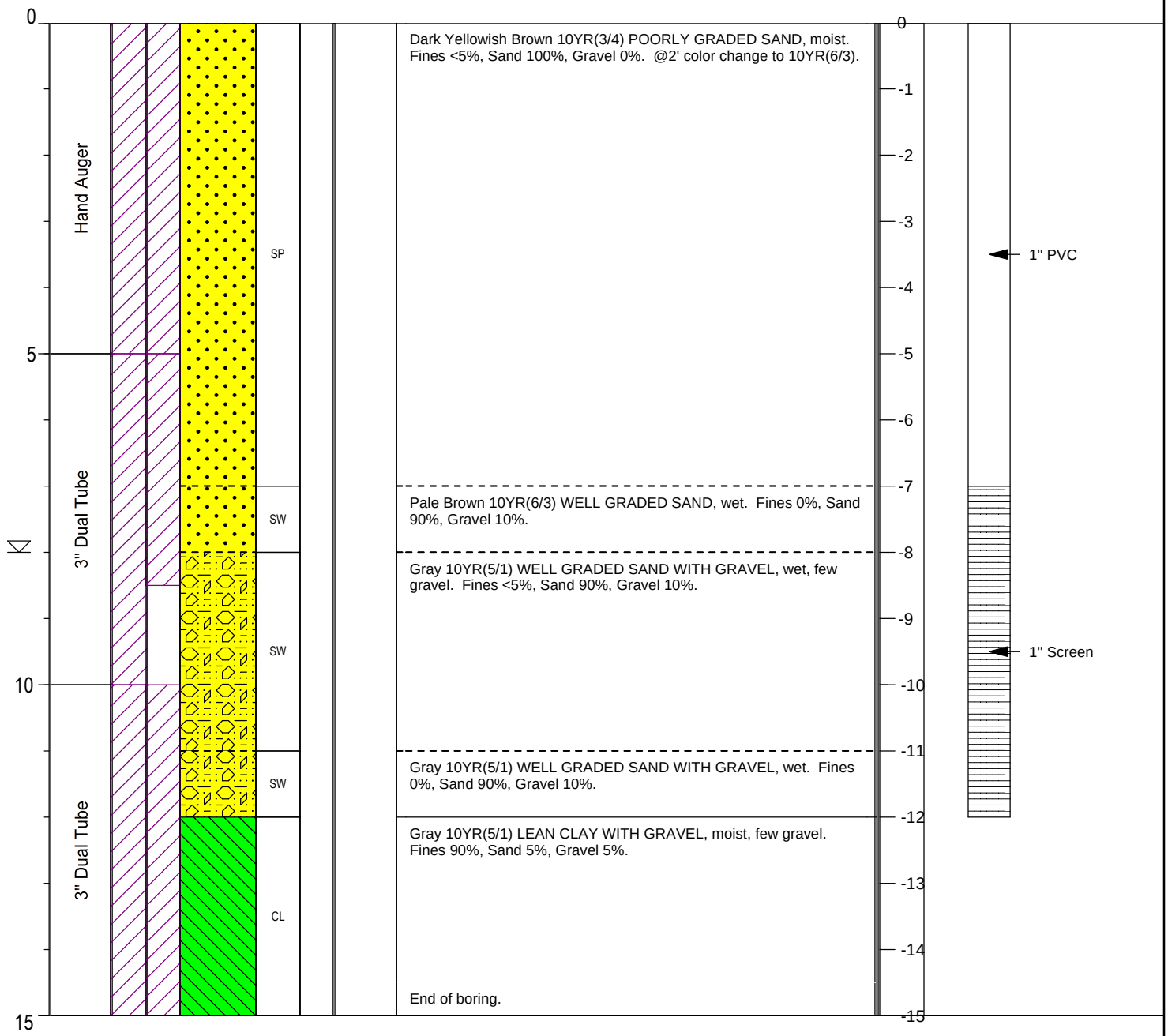
BOREHOLE NO: **SK1-TMW6**
TOTAL DEPTH: **15'**

PROJECT INFORMATION

PROJECT:	**Lapeer Plating**
SITE LOCATION:	**Lapeer, MI**
PROJECT NO.:	**60570635**
PROJECT MANAGER:	**John Cuthbertson**
LOGGED BY:	**Stan Krenz**
CREATED BY:	**Stan Krenz**

DRILLING INFORMATION

CONTRACTOR:	**Job Site Services**
CREW CHIEF:	**Dave Mokma**
DRILL RIG TYPE:	**Geoprobe 7720DT**
DRILLING METHOD:	**3" Dual Tube**
HOLE DIAMETER:	**3.25"**
DATE START:	**5/1/18 0700**
DATE END:	**5/1/18 0825**



NOTES:

Water level during drilling Water level in completed well

Appendix B

Brookston loam (0 to 2 percent slopes) (Bw).—This soil is on till plains throughout the county. Included with it in mapping were a few areas of gently sloping Brookston soils.

Unless artificially drained by tile and ditches, this soil has severe limitations for crops, pasture, and trees. It warms up and dries out slowly in spring, and there are small depressions and drainageways that stay wet longer than the surrounding areas. Farm machinery bogs down readily during wet weather in spring and fall. The soil material is stable, and tile and ditches are easily maintained. Some areas lack outlets for drainage. Frost damage is a hazard to crops in low areas.

Most of this soil is farmed intensively. Corn is the crop most commonly grown. Scattered small areas are in woods. (Capability unit IIw–4 (2.5c); woodland suitability group P)

Capac fine sandy loam, 0 to 2 percent slopes (CaA).—This soil is on till plains in the central and northern parts of the county. In a few areas the plow layer is loam or sandy loam rather than fine sandy loam. Included in mapping were small areas of gently sloping Capac soils. Also included were small areas of the darker colored and more poorly drained Brookston soils in drainageways and depressions. These Brookston soils dry out more slowly than the surrounding Capac soils.

Excessive wetness early in spring is the main limitation for farming. Farm machinery bogs down, and the growth of roots is restricted unless the water table is lowered. Tile drainage is needed for efficient production of most crops. The soil material is stable, and ditches and tile are easy to maintain.

Nearly all of this soil is intensively farmed. Corn, sugar beets, small grain, and forage crops are grown. (Capability unit IIw–4 (2.5b); woodland suitability group Z)

Capac fine sandy loam, 2 to 6 percent slopes (CaB).—This soil is on till plains in the central and northern parts of the county. The slopes are uniform, are medium to long, and generally have a gradient of less than 5 percent. In some areas the plow layer is loam or sandy loam rather than fine sandy loam. Included in mapping were areas of moderately eroded Capac soils, mainly where the slope is 5 or 6 percent. In these eroded areas, the plow layer is lighter colored and contains some clay loam plowed up from the subsoil. Also included were areas of the slightly coarser textured Belding soils at slightly higher elevations and of the dark-colored, poorly drained Brookston soils in depressions and drainageways. The included Brookston soils dry out and warm up slowly in spring.

Excessive wetness early in spring is the main limitation for farming. Tile drainage is needed for efficient production of crops. Uneven relief in a few areas makes it difficult to plan complete drainage systems. Random tile and surface ditches are effective in such areas.

Nearly all of this soil is farmed intensively. Corn, sugar beets, small grain, and forage crops are grown. (Capability unit IIw–5 (2.5b); woodland suitability group Z)

Carlisle muck (0 to 1 percent slopes) (Cc).—This soil occurs in depressions on till plains, outwash plains, and moraines throughout the county.

Excessive wetness is the main limitation for farming. Unless the water table is lowered by artificial drainage, farm machinery bogs down and farming operations are hampered. The water table should be controlled at a level low enough to allow adequate room for growth of roots but not so low that the organic material will settle. Some areas lack outlets for drainage. Shortages of phosphorus, potassium, and several micronutrients, including manganese, boron, copper, and zinc, constitute another limitation. Frost damage is a hazard to crops in the lowest areas, and soil blowing is also a hazard if large areas are cultivated.

If this soil is artificially drained, adequately fertilized, and protected against the wind, many short-season, frost-resistant crops can be grown. Most of the larger areas have been drained and are farmed intensively. Vegetables for market are common crops. Small areas are in woods. (Capability unit IIIw–15 (Mc); woodland suitability group J)

Chelsea loamy sand, 0 to 6 percent slopes (ChB).—This soil is on broad outwash plains. The plow layer is dark brown or dark grayish brown. Wet depressions and drainageways are included in some of the areas mapped.

Permeability is rapid, and the available water capacity is low. The result is a shortage of moisture during most of the growing season. This lack of moisture is the main limitation.

Most of this soil is idle or is used for native hay or pasture. Large acreages have been planted to pine, and small areas are used for corn and garden vegetables. (Capability unit IVs–4 (5a); woodland suitability group E)

Chelsea loamy sandy, 6 to 12 percent slopes (ChC).—This soil is on moraines. The slopes are short and irregular. The surface layer is dark brown or dark grayish brown; where organic matter has accumulated, the uppermost 4 or 5 inches is very dark grayish brown to very dark brown.

The slope and a shortage of moisture make this soil unsuitable for cultivated crops and limit its use for improved pasture. Enough water is available for trees.

Most of the acreage is in woods or brush. Most cleared areas are in native pasture or native hay. Reforesting of abandoned areas is a desirable practice. (Capability unit VIs–1 (5a); woodland suitability group E)

Fabius-Wasepi sandy loams, 0 to 2 percent slopes (FoA).—This complex occurs on lake plains and outwash plains throughout the county. In some places the plow layer contains a little gravel.

This mapping unit is made up of about equal acreages of Fabius sandy loam and Wasepi sandy loam, which occur together in such complex patterns that they cannot be shown separately on the soil map. The two soils are similar in texture and in drainage characteristics, and both are underlain with stratified sand and gravel, but in Fabius sandy loam the depth to the underlying material is less than 24 inches, and in Wasepi sandy loam it is 24 to 42 inches. Included with these soils in mapping were areas of the poorly drained Gilford soils in drainageways. These included soils stay wet longer than the surrounding Fabius and Wasepi soils.

Excessive wetness and low to moderate fertility are the major limitations for farming. Drainage can be improved by the use of tile, open ditches, and surface drains. It is advisable to install tile and to dig ditches during dry weather, because ditches and trenches cave in readily when the soils are wet. Some areas lack outlets for drainage. Straw or other blinding material helps to keep soil material from flowing into and plugging tile.

Corn and forage crops are commonly grown in drained areas of this complex, and native pasture plants in undrained areas. (Capability unit IIIw–5 (4b); woodland suitability group G)

Locke sandy loam, 2 to 6 percent slopes (LoB).—This soil occurs on till plains and low moraines throughout the county. The plow layer is very dark grayish brown. In some areas it contains a little material plowed up from the subsurface layer, and in some areas it is loam rather than sandy loam. The slopes are uniform and of medium length, and the topography is undulating. Included in mapping were areas of moderately eroded soils that have a slope range of 4 to 6 percent, small areas of level Locke soils, and areas of Barry soils in narrow drainageways. The included Barry soils stay wet longer than the surrounding Locke soil.

This Locke soil is affected by a high water table and by runoff from adjacent higher soils. Laying out a complete drainage system is difficult, because of the undulating relief and closed depressions, but random tile drains and surface drains are effective.

Corn and small grain are important crops. (Capability unit IIw–7 (3b); woodland suitability group G)

Marlette sandy loam, 2 to 6 percent slopes, moderately eroded (MfB2).—This soil is on moraines and undulating till plains in the central and northern parts of the county. The slopes are uniform and are short to medium in length. The plow layer is brown. In some places it is loam rather than sandy loam in texture, and in some it contains a little dark yellowish-brown clay loam plowed up from the subsoil. Fertility is lower, the organic-matter content is less, runoff is more rapid, tilth is poorer, and crusting of the surface is more likely than in uneroded Marlette soils. Included in mapping were small areas of severely eroded Marlette soils that have short slopes of 5 or 6 percent. Gravel and cobblestones are scattered on the surface in these severely eroded spots; germination of seeds is uneven, and stands of plants are poor. Also included were spots of darker colored Capac soils in drainageways. These included Capac soils stay wet longer than the surrounding Marlette soil.

A moderate hazard of further erosion is the main limitation for farming.

Most of this soil is intensively farmed. Corn, small grain, and forage crops are the common crops. (Capability unit IIe–2 (2.5a); woodland suitability group D)

Marlette sandy loam, 6 to 12 percent slopes, moderately eroded (MfC2).—This soil is on moraines in the central and northern parts of the county. The slopes are short and slightly irregular. In most areas the plow layer consists of brown heavy sandy loam. In some areas it is loam rather than sandy loam, and in some it contains dark yellowish-brown clay loam plowed up from the subsoil. The present plow layer is less fertile, contains less organic matter, has poorer tilth, is more likely to crust, and contains more gravel than that of uneroded Marlette soils. Included in mapping were severely eroded spots, in which the dark yellowish-brown subsoil is exposed and gravel and cobblestones are scattered on the surface. In these severely eroded spots, germination of seeds is uneven and stands of plants are poor. Small areas of level and gently sloping Marlette soils were included also.

The hazard of further erosion is the main limitation for farming. Contour farming and contour stripcropping are not practical, because of short, irregular slopes. Grasses and legumes in the cropping sequence help to check runoff and control erosion.

All of this soil is or has been intensively farmed. Corn, small grain, and forage crops are the main crops. (Capability unit IIIe–5 (2.5a); woodland suitability group D)

Marlette sandy loam, 6 to 12 percent slopes, severely eroded (MfC3).—This soil is on moraines in the central and northern parts of the county. The slopes are short and irregular. Most of the original surface layer and subsurface layer has been removed by erosion, and the clay loam subsoil is exposed in small areas. The present plow layer is dark yellowish brown. It is less fertile, contains less organic matter, absorbs less water and allows more to runoff, and is more likely to crust than the plow layer of uneroded Marlette soils. Germination of seeds is uneven, and stands of plants are poor. Shallow gullies have formed in a few areas, mainly in natural drainageways.

The hazard of further erosion is a very severe limitation for farming.

All of this soil has been farmed intensively, but now much of it is idle or is in brush or native grass. Close-growing crops are better suited than row crops. Permanent vegetation reduces the risk of further erosion. (Capability unit IVe–5 (2.5a); woodland suitability group D)

Menominee loamy sand, 2 to 6 percent slopes (MmB).—This soil is on plains and low moraines. Where cultivated it has a very dark grayish-brown plow layer. Included in mapping were areas of the darker colored Iosco soils in narrow drainageways and depressions. These included soils dry out more slowly than the surrounding Menominee soil. Also included were small areas of level Menominee soils.

A shortage of available water during the growing season is the main limitation for farming.

Most of this soil is farmed. Small grain and forage crops are the crops commonly grown. (Capability unit IIIs–4 (4/2a); woodland suitability group C)

Menominee loamy sand, 6 to 12 percent slopes (MmC).—This soil is on low moraines. It has short slopes, some uniform and some irregular. The plow layer in cultivated areas is brown. Included in mapping were small areas of moderately eroded Menominee soils.

An erosion hazard and a shortage of available water during the growing season are the main limitations for farming.

Small grain and forage crops are the crops commonly grown. (Capability unit IIIe–9 (4/2a); woodland suitability group C)

Montcalm loamy sand, 6 to 12 percent slopes (MrC).—This soil is on moraines in the central and northern parts of the county. It has short, irregular slopes. Where organic matter has accumulated, the surface layer is very dark grayish brown to a depth of several inches. Included in mapping were small areas of moderately eroded Montcalm soils.

Both water erosion and soil blowing are hazards that limit the use of this soil. A shortage of available water slows the growth of crops in midsummer.

Much of this soil is in woods or native pasture. Most cultivated areas are used for small grain, forage, or pasture. (Capability unit IIIe–9 (4a); woodland suitability group M)

Tawas muck (0 to 1 percent slopes) (Ta).—This soil is in swampy depressions throughout the county.

Excessive wetness and low fertility are the main limitations. Artificial drainage is difficult because the underlying sand tends to cave into ditches and tile trenches. Farm machinery bogs down when the soil is wet. Lowering the water table too much can cause the organic material to settle. The supplies of phosphorus, potassium, and micronutrients are inadequate. Frost damage is a hazard to crops in low spots. Fire and soil blowing can reduce the thickness of the organic material.

If drained, fertilized, and protected against the wind, this soil is suited to many short-season, frost-resistant crops. Most of the larger areas have been drained and are cultivated. The smaller areas are in woods. (Capability unit IVw–5 (M/4c); woodland suitability group J)

Appendix C

May 31, 2018

Vista Work Order No. 1800896

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 May 04, 2018. This sample set was analyzed on a standard turn-around time, under your Project Name 'Lapeer Sampling'.

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

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

Sincerely,

Martha Maier
Laboratory Director

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

Vista Work Order No. 1800896
Case Narrative

Sample Condition on Receipt:

Six groundwater and seven 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. Sample "FB1-180502" was not listed on the CoC. Authorization to proceed with the analysis was received by email on May 16, 2018.

Analytical Notes:

PFAS Isotope Dilution Method

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

Laboratory ID	Sample Name
1800896-01	SKITMW113180501N
1800896-02	SKITMW211180501N
1800896-03	SKITMW308180430N
1800896-05	SKITMW506180430N
1800896-06	SKITMW606180501N
1800896-07	EB01-180426
1800896-08	QC-180426

The samples were extracted and analyzed for a selected list of PFAS using the PFAS Isotope Dilution Method (Modified EPA Method 537).

Holding Times

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

Quality Control

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

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

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

QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
1800896-01	SKITMW113180501N	PFAS Isotope Dilution Method	13C3-PFBS	H	188
1800896-01	SKITMW113180501N	PFAS Isotope Dilution Method	13C8-PFOSA	H	40.9
1800896-02	SKITMW211180501N	PFAS Isotope Dilution Method	13C3-PFBS	H	206
1800896-03	SKITMW308180430N	PFAS Isotope Dilution Method	13C8-PFOSA	H	44.1
1800896-04	SKITMW410180430N	PFAS Isotope Dilution Method	13C8-PFOSA	H	42.6
1800896-05	SKITMW506180430N	PFAS Isotope Dilution Method	13C3-PFBS	H	151
1800896-07	EB01-180426	PFAS Isotope Dilution Method	13C8-PFOSA	H	49.1
1800896-08	QC-180426	PFAS Isotope Dilution Method	13C8-PFOSA	H	46.7
1800896-09	EB01-180427	PFAS Isotope Dilution Method	13C8-PFOSA	H	35.2
1800896-10	QC1-180430	PFAS Isotope Dilution Method	13C8-PFOSA	H	35.1
1800896-11	FB1-180430	PFAS Isotope Dilution Method	13C8-PFOSA	H	49.4
B8E0080-BLK1	B8E0080-BLK1	PFAS Isotope Dilution Method	13C8-PFOSA	H	47.8
B8E0159-BLK1	B8E0159-BLK1	PFAS Isotope Dilution Method	13C8-PFOSA	H	46.9

H = Recovery was outside laboratory acceptance criteria.

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800896-01	SKITMW113180501N	01-May-18 11:05	04-May-18 09:48	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800896-02	SKITMW211180501N	01-May-18 12:30	04-May-18 09:48	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800896-03	SKITMW308180430N	30-Apr-18 15:25	04-May-18 09:48	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800896-04	SKITMW410180430N	30-Apr-18 13:35	04-May-18 09:48	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800896-05	SKITMW506180430N	30-Apr-18 17:10	04-May-18 09:48	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800896-06	SKITMW606180501N	01-May-18 08:25	04-May-18 09:48	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800896-07	EB01-180426	26-Apr-18 09:30	04-May-18 09:48	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800896-08	QC-180426	26-Apr-18 17:30	04-May-18 09:48	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800896-09	EB01-180427	27-Apr-18 06:50	04-May-18 09:48	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800896-10	QC1-180430	30-Apr-18 17:30	04-May-18 09:48	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800896-11	FB1-180430	30-Apr-18 18:00	04-May-18 09:48	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800896-12	EB1-180430	30-Apr-18 18:05	04-May-18 09:48	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 1800896

Client Project: Lapeer Sampling

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0080-BLK1
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.365	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFPeA	2706-90-3	ND	0.640	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFBS	375-73-5	ND	0.895	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFHxA	307-24-4	ND	1.09	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFHpA	375-85-9	ND	0.296	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFHxS	355-46-4	ND	0.474	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
6:2 FTS	27619-97-2	ND	1.00	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFOA	335-67-1	ND	0.326	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFHpS	375-92-8	ND	0.469	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFOS	1763-23-1	ND	0.404	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFNA	375-95-1	ND	0.405	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFDA	335-76-2	ND	0.745	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
8:2 FTS	39108-34-4	ND	1.03	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFOSA	754-91-6	ND	0.885	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
MeFOSAA	2355-31-9	ND	0.825	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFDS	335-77-3	ND	0.615	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFUnA	2058-94-8	ND	0.525	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
EtFOSAA	2991-50-6	ND	0.685	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFDoA	307-55-1	ND	0.396	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFTrDA	72629-94-8	ND	0.247	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFTeDA	376-06-7	ND	0.378	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFNS	68259-12-1	ND	1.94	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
PFPeS	2706-91-4	ND	1.37	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
4:2 FTS	757124-72-4	ND	1.37	2.50	4.00		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	90.4	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
13C3-PFPeA	IS	90.2	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
13C3-PFBS	IS	112	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
13C2-PFHxA	IS	85.9	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
13C4-PFHpA	IS	82.8	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
18O2-PFHxS	IS	92.0	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
13C2-PFOA	IS	77.8	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
13C8-PFOS	IS	89.1	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
13C5-PFNA	IS	73.0	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
13C2-PFDA	IS	69.1	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
13C8-PFOSA	IS	47.8	50 - 150	H	B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
d3-MeFOSAA	IS	72.4	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
13C2-PFUnA	IS	57.8	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1

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

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous

Project: Lapeer Sampling

Laboratory Data

Lab Sample: B8E0080-BLK1 Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	74.7	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
13C2-PFDoA	IS	76.3	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1
13C2-PFTeDA	IS	55.1	50 - 150		B8E0080	10-May-18	0.250 L	25-May-18 04:15	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

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

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous
Project: Lapeer Sampling

Laboratory Data

Lab Sample: B8E0080-BS1 Column: BEH C18

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	42.1	40.0	105	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFPeA	2706-90-3	41.5	40.0	104	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFBS	375-73-5	42.1	40.0	105	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFHxA	307-24-4	40.0	40.0	100	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFHpA	375-85-9	43.3	40.0	108	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFHxS	355-46-4	39.1	40.0	97.8	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
6:2 FTS	27619-97-2	37.3	40.0	93.3	60-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFOA	335-67-1	45.9	40.0	115	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFHpS	375-92-8	51.1	40.0	128	60-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFOS	1763-23-1	42.3	40.0	106	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFNA	375-95-1	37.7	40.0	94.2	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFDA	335-76-2	40.9	40.0	102	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
8:2 FTS	39108-34-4	39.1	40.0	97.9	60-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFOSA	754-91-6	40.9	40.0	102	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
MeFOSAA	2355-31-9	35.7	40.0	89.1	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFDS	335-77-3	51.6	40.0	129	60-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFUnA	2058-94-8	42.1	40.0	105	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
EtFOSAA	2991-50-6	38.2	40.0	95.5	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFDoA	307-55-1	44.2	40.0	110	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFTrDA	72629-94-8	40.8	40.0	102	60-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFTeDA	376-06-7	50.5	40.0	126	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFNS	68259-12-1	39.3	40.0	98.1	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
PFPeS	2706-91-4	42.9	40.0	107	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
4:2 FTS	757124-72-4	37.2	40.0	93.0	70-130		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.2	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
13C3-PFPeA	IS	100	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
13C3-PFBS	IS	127	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
13C2-PFHxA	IS	100	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
13C4-PFHpA	IS	102	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
18O2-PFHxS	IS	108	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
13C2-PFOA	IS	90.8	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
13C8-PFOS	IS	97.4	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
13C5-PFNA	IS	96.9	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
13C2-PFDA	IS	81.9	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1

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

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0080-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOSA	IS	57.0	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
d3-MeFOSAA	IS	87.0	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
13C2-PFUnA	IS	70.2	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
d5-EtFOSAA	IS	79.2	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
13C2-PFDoA	IS	87.0	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1
13C2-PFTeDA	IS	60.6	50- 150		B8E0080	10-May-18	0.250 L	25-May-18 04:25	1

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0159-BLK1
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.365	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFPeA	2706-90-3	ND	0.640	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFBS	375-73-5	ND	0.895	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFHxA	307-24-4	ND	1.09	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFHpA	375-85-9	ND	0.296	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFHxS	355-46-4	ND	0.474	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
6:2 FTS	27619-97-2	ND	1.00	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFOA	335-67-1	ND	0.326	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFHpS	375-92-8	ND	0.469	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFOS	1763-23-1	0.680	0.404	2.50	4.00	J	B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFNA	375-95-1	ND	0.405	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFDA	335-76-2	ND	0.745	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
8:2 FTS	39108-34-4	ND	1.03	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFOSA	754-91-6	ND	0.885	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
MeFOSAA	2355-31-9	ND	0.825	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFDS	335-77-3	ND	0.615	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFUnA	2058-94-8	ND	0.525	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
EtFOSAA	2991-50-6	ND	0.685	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFDoA	307-55-1	ND	0.396	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFTrDA	72629-94-8	ND	0.247	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFTeDA	376-06-7	ND	0.378	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFNS	68259-12-1	ND	1.94	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
PFPeS	2706-91-4	ND	1.37	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
4:2 FTS	757124-72-4	ND	1.37	2.50	4.00		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	86.7	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
13C3-PFPeA	IS	83.5	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
13C3-PFBS	IS	97.2	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
13C2-PFHxA	IS	87.7	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
13C4-PFHpA	IS	77.3	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
18O2-PFHxS	IS	89.0	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
13C2-PFOA	IS	73.1	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
13C8-PFOS	IS	84.4	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
13C5-PFNA	IS	78.6	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
13C2-PFDA	IS	98.1	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
13C8-PFOSA	IS	46.9	50 - 150	H	B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
d3-MeFOSAA	IS	72.3	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
13C2-PFUnA	IS	74.3	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1

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

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous

Project: Lapeer Sampling

Laboratory Data

Lab Sample: B8E0159-BLK1 Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	77.2	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
13C2-PFDoA	IS	85.9	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1
13C2-PFTeDA	IS	52.8	50 - 150		B8E0159	18-May-18	0.250 L	24-May-18 08:19	1

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit

Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

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

Client Data

Name: Merit LaboratorieI. Gncu
Project: Lapeer Sampling

Matrix: F 4AeoAI

Laboratory Data

Lab Sample: B8E0-1s,BS- HolAmn: BEq H-8

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
P2BF	591,77,3	5yu7	30u0	s0uy	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2PeF	790y,s0,5	51ul	30u0	88u9	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2BS	591,95,1	59u+	30u0	s7uy	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2q xF	509,73,3	5yu7	30u0	s0u3	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2q pF	591,81,s	57u3	30u0	8-u0	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2q xS	511,3y,3	58u8	30u0	syus	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
y:7 2TS	79y-s,s9,7	7yu8	30u0	y9u0	y0,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2OF	551,y9,-	53uy	30u0	8yu3	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2q pS	591,s7,8	51ul	30u0	88u8	y0,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2OS	-9y5,75,-	53uy	30u0	8yu3	90,-50	B	B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2NF	591,s1,-	51u0	30u0	89u3	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2DF	551,9y,7	57u+	30u0	80u7	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
8:7 2TS	5s-08,53,3	51u7	30u0	88u0	y0,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2OSF	913,s-,y	53u7	30u0	81u3	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
Me2OSF F	7511,5-,s	7su+	30u0	97us	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2DS	551,99,5	51u9	30u0	8su5	y0,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2UnF	7018,s3,8	58uy	30u0	syul	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
Et2OSF F	7ss-,10,y	57u+	30u0	80u7	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2DoF	509,11,-	7su8	30u0	93u3	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2TrDF	97y7s,s3,8	59uy	30u0	s3u0	y0,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2TeDF	59y,0y,9	35u9	30u0	-0s	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2NS	y871s,-7,-	55u3	30u0	85uy	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
P2PeS	790y,s-,3	55u7	30u0	85u0	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
3:7 2TS	919-73,97,3	5-u+	30u0	99uy	90,-50		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
-5H5,P2BF	CS	s-u+	10,-10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
-5H5,P2PeF	CS	s8uy	10,-10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
-5H5,P2BS	CS	--5	10,-10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
-5H7,P2q xF	CS	8su8	10,-10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
-5H3,P2q pF	CS	syus	10,-10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
-8O7,P2q xS	CS	s0ul	10,-10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
-5H7,P2OF	CS	8yuy	10,-10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
-5H8,P2OS	CS	s1ul	10,-10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
-5H1,P2NF	CS	80u7	10,-10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
-5H7,P2DF	CS	s5us	10,-10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-

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

Client Data

Name: Merit LaboratorieI. Gncu
Project: Lapeer Sampling
Matrix: F 4AeoAI

Laboratory Data

Lab Sample: B8E0-1s,BS- HolAmn: BEq H-8

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
-5H8,P2OSF	CS	11us	10, -10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
d5,Me2OSF F	CS	98u3	10, -10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
-5H7,P2UnF	CS	98ul	10, -10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
d1,Et2OSF F	CS	ysuy	10, -10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
-5H7,P2DoF	CS	99u7	10, -10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-
-5H7,P2TeDF	CS	y9u5	10, -10		B8E0-1s	-8,Ma6,-8	0u710 L	73,Ma6,-8 08:0s	-

Sample ID: SKITMW113180501N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: LAPEER
Matrix: Groundwater
Date Collected: 01-May-18 11:05

Laboratory Data

Lab Sample: 1800896-01
Date Received: 04-May-18 09:48
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	1.06	0.348	2.39	3.82	J	B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFPeA	2706-90-3	ND	0.612	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFBS	375-73-5	11.2	0.856	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFHxA	307-24-4	ND	1.04	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFHpA	375-85-9	ND	0.282	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFHxS	355-46-4	ND	0.453	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
6:2 FTS	27619-97-2	ND	0.956	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFOA	335-67-1	ND	0.311	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFHpS	375-92-8	ND	0.448	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFOS	1763-23-1	1.30	0.386	2.39	3.82	J	B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFNA	375-95-1	ND	0.387	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFDA	335-76-2	ND	0.712	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
8:2 FTS	39108-34-4	ND	0.985	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFOSA	754-91-6	ND	0.846	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
MeFOSAA	2355-31-9	ND	0.789	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFDS	335-77-3	ND	0.588	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFUnA	2058-94-8	ND	0.502	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
EtFOSAA	2991-50-6	ND	0.655	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFDoA	307-55-1	ND	0.379	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFTrDA	72629-94-8	ND	0.236	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFTeDA	376-06-7	ND	0.361	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFNS	68259-12-1	ND	1.85	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
PFPeS	2706-91-4	ND	1.31	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
4:2 FTS	757124-72-4	ND	1.31	2.39	3.82		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.8	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
13C3-PFPeA	IS	90.1	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
13C3-PFBS	IS	188	50 - 150	H	B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
13C2-PFHxA	IS	87.1	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
13C4-PFHpA	IS	98.1	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
18O2-PFHxS	IS	100	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
13C2-PFOA	IS	74.3	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
13C8-PFOS	IS	102	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
13C5-PFNA	IS	80.1	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
13C2-PFDA	IS	81.9	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
13C8-PFOSA	IS	40.9	50 - 150	H	B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
d3-MeFOSAA	IS	102	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
13C2-PFUnA	IS	81.4	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1

Sample ID: SKITMW113180501N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: LAPEER

Matrix: Groundwater
Date Collected: 01-May-18 11:05

Laboratory Data

Lab Sample: 1800896-01
Date Received: 04-May-18 09:48

Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	118	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
13C2-PFDoA	IS	66.9	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1
13C2-PFTeDA	IS	73.7	50 - 150		B8E0080	10-May-18	0.262 L	25-May-18 04:46	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: SKITMW211180501N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I .ncu
Project: Lapeer Sampling
Location: LF PHHv

Matrix: wroBndy ater
Date Collected: 01-Ma5-18 1s:R0

Laboratory Data

Lab Sample: 1800896-0s
Date v ecei4ed: 0A-Ma5-18 09:A8

ColBmn: EHG C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
P3EF	R72-ss-A	suRR	0uRA8	suR9	Ru8s	J	E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3PeF	s706-90-R	0u9R9	0u611	suR9	Ru8s	J	E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3ES	R72-7R-2	AAu9	0u82A	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3GxF	R07-sA-A	ND	1u0A	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3GpF	R72-82-9	0uA79	0us8s	suR9	Ru8s	J	E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3GxS	R22-A6-A	Ru07	0uA2s	suR9	Ru8s	J	E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
6:s 3TS	s7619-97-s	ND	0u92A	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3OF	RR2-67-1	ND	0uR11	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3GpS	R72-9s-8	ND	0uAA7	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3OS	176R-sR-1	9u80	0uR82	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3NF	R72-92-1	ND	0uR87	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3DF	RR2-76-s	ND	0u711	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
8:s 3TS	R9108-RA-A	ND	0u98R	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3OSF	72A-91-6	ND	0u8A2	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
Me3OSF F	sR22-R1-9	ND	0u787	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3DS	RR2-77-R	ND	0u287	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3UnF	s028-9A-8	ND	0u201	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
Ht3OSF F	s991-20-6	ND	0u62A	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3DoF	R07-22-1	ND	0uR78	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3TrDF	7s6s9-9A-8	ND	0usR6	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3TeDF	R76-06-7	ND	0uR60	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3NS	68s29-1s-1	ND	1u82	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
P3PeS	s706-91-A	ND	1uR1	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
A:s 3TS	7271sA-7s-A	ND	1uR1	suR9	Ru8s		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
1RCR-P3EF	.S	98uR	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
1RCR-P3PeF	.S	8Ru7	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
1RCR-P3ES	.S	s06	20 - 120	G	E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
1RCs-P3GxF	.S	99u0	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
1RCA-P3GpF	.S	108	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
18Os-P3GxS	.S	116	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
1RCs-P3OF	.S	78u2	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
1RC8-P3OS	.S	86u8	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
1RC2-P3NF	.S	10A	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
1RCs-P3DF	.S	82us	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
1RC8-P3OSF	.S	29u8	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
dR-Me3OSF F	.S	1As	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
1RCs-P3UnF	.S	9Ru9	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1

Sample ID: SKITMW211180501N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I .ncu
Project: Lapeer Sampling
Location: LF PHHv

Matrix: wroBndy ater
Date Collected: 01-Ma5-18 1s:R0

Laboratory Data

Lab Sample: 1800896-0s
Date v ecei4ed: 0A-Ma5-18 09:A8

ColBmn: EHG C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d2-Ht3OSF F	.S	1AA	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
1RCs-P3DoF	.S	89uR	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1
1RCs-P3TeDF	.S	9Rul	20 - 120		E8H0080	10-Ma5-18	0us6s L	s2-Ma5-18 0A:26	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of qBantitation
LCL-UCL- Loy er control limit - Bpper control limit
v e, Blt, reported to the DLu
When reportedI P3GxSI P3OF and P3OS inclBde both linear and branched i, omer, u
Onl5 the linear i, omer i, reported for all other anal5te, u

Sample ID: SKITMW308180430N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I .ncu
Project: Lapeer Sampling
Location: L5 PHH4

Matrix: wroBndy ater
Date Collected: s0-5 pr-18 1R:vR

Laboratory Data

Lab Sample: 1800896-0s
Date 4 eceiAed: 0F-Ma3-18 09:F8

ColBmn: EHG C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PJ E5	s7R-vv-F	1u6s	0us69	vuRs	Fu0R	2	E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ Pe5	v706-90-s	ND	0u6F8	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ ES	s7R-7s-R	1u0R	0u906	vuRs	Fu0R	2	E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ Gx5	s07-vF-F	ND	1ul0	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ Gp5	s7R-8R-9	ND	0uv99	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ GxS	sRR-F6-F	ND	0uF79	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
6:v J TS	v7619-97-v	1u0v	1u01	vuRs	Fu0R	2	E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ O5	ssR-67-1	0u6vF	0usv9	vuRs	Fu0R	2	E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ GpS	s7R-9v-8	ND	0uF7F	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ OS	176s-vs-1	0u9v9	0uF08	vuRs	Fu0R	2	E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ N5	s7R-9R-1	ND	0uF10	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ D5	ssR-76-v	ND	0u7RF	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
8:v J TS	s9108-sF-F	ND	1u0F	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ OS5	7RF-91-6	ND	0u896	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
MeJ OS5 5	vsRR-s1-9	ND	0u8sR	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ DS	ssR-77-s	ND	0u6vv	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ Un5	v0R8-9F-8	ND	0uRs1	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
HtJ OS5 5	v991-R0-6	ND	0u69s	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ Do5	s07-RR-1	ND	0uF01	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ TrD5	7v6v9-9F-8	ND	0uvR0	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ TeD5	s76-06-7	ND	0us8v	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ NS	68vR9-1v-1	ND	1u96	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
PJ PeS	v706-91-F	ND	1us9	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
F:v J TS	7R71vF-7v-F	ND	1us9	vuRs	Fu0R		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
1sCs-PJ E5	.S	96u6	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
1sCs-PJ Pe5	.S	9vu7	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
1sCs-PJ ES	.S	1F0	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
1sCv-PJ Gx5	.S	97u8	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
1sCF-PJ Gp5	.S	10R	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
18Ov-PJ GxS	.S	10F	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
1sCv-PJ O5	.S	77u8	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
1sC8-PJ OS	.S	10v	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
1sCR-PJ N5	.S	81uF	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
1sCv-PJ D5	.S	89u6	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
1sC8-PJ OS5	.S	FFul	R0 - 1R0	G	E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
ds-MeJ OS5 5	.S	9vuR	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
1sCv-PJ Un5	.S	78u8	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1

Sample ID: SKITMW308180430N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I .ncu
Project: Lapeer Sampling
Location: L5 PHH4

Matrix: wroBndy ater
Date Collected: s0-5 pr-18 1R:vR

Laboratory Data

Lab Sample: 1800896-0s
Date 4 eceiAed: 0F-Ma3-18 09:F8

ColBmn: EHG C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
dR-HtJ OS5 5	.S	109	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
1s Cv-PJ Do5	.S	8vu0	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1
1s Cv-PJ TeD5	.S	6Fu6	R0 - 1R0		E8H0080	10-Ma3-18	0uvF7 L	vR-Ma3-18 0R:07	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of qBantitation
LCL-UCL- Loy er control limit - Bpper control limit
4 e, Blt, reported to the DLu
When reportedI PJ GxSI PJ O5 and PJ OS inclBde both linear and branched i, omer, u
Onl3 the linear i, omer i, reported for all other anal3te, u

Sample ID: SKITMW308018348N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I .ncu
Project: Lapeer Sampling
Location: LRPHH4

Matrix: wroBndy ater
Date Collected: 50-Rpr-18 15:5v

Laboratory Data

Lab Sample: 1800896-0s
Date 4 eceiAed: 0s-MaF-18 09:s8

ColBmn: EHG C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
P3ER	5Jv-77-s	0uv8J	0u6v1	7us1	5ut86	2	E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3PeR	7J06-90-5	ND	0u61J	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3ES	5Jv-J5-v	1u57	0u865	7us1	5ut86	2	E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3GxR	50J-7s-s	ND	1u0v	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3GpR	5Jv-8v-9	ND	0u78v	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3GxS	5vv-s6-s	ND	0usv6	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
6:7 3TS	7J619-9J-7	ND	0u96s	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3OR	55v-6J-1	ND	0u61s	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3GpS	5Jv-97-8	ND	0usv7	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3OS	1J65-75-1	ND	0u589	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3NR	5Jv-9v-1	ND	0u590	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3DR	55v-J6-7	ND	0uJ18	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
8:7 3TS	59108-5s-s	ND	0u995	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3OSR	Jvs-91-6	ND	0u8v5	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
Me3OSRR	75vv-51-9	ND	0uJ9v	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3DS	55v-JJ-5	ND	0uv95	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3UnR	70v8-9s-8	ND	0uv06	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
Ht3OSRR	7991-v0-6	ND	0u660	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3DoR	50J-vv-1	ND	0u587	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3TrDR	J7679-9s-8	ND	0u758	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3TeDR	5J6-06-J	ND	0u56s	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3NS	687v9-17-1	ND	1ut86	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
P3PeS	7J06-91-s	ND	1u57	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
s:7 3TS	JvJ17s-J7-s	ND	1u57	7us1	5ut86		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
15C5-P3ER	.S	97uv	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
15C5-P3PeR	.S	99uv	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
15C5-P3ES	.S	11J	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
15C7-P3GxR	.S	95v9	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
15Cs-P3GpR	.S	90u6	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
18O7-P3GxS	.S	115	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
15C7-P3OR	.S	86u0	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
15C8-P3OS	.S	10J	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
15Cv-P3NR	.S	86uv	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
15C7-P3DR	.S	J5u5	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
15C8-P3OSR	.S	s7u6	v0 - 1v0	G	E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
d5-Me3OSRR	.S	8vu8	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
15C7-P3UnR	.S	J6us	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1

Sample ID: SKITMW308018348N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I.ncu
Project: Lapeer Sampling
Location: LRPHH4

Matrix: wroBndy ater
Date Collected: 50-Rpr-18 15:5v

Laboratory Data

Lab Sample: 1800896-0s
Date 4eceiAed: 0s-MaF-18 09:s8

ColBmn: EHG C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
dv-Ht3OSRR	.S	8Jus	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
15C7-P3DoR	.S	J7u0	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1
15C7-P3TeDR	.S	6sul	v0 - 1v0		E8H0080	10-MaF-18	0u7v9 L	7v-MaF-18 0v:1J	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of qBantitation
LCL-UCL- Loy er control limit - Bpper control limit
4e, Blt, reported to the DLu
When reportedI P3GxSI P3OR and P3OS inclBde both linear and branched i, omer, u
OnlF the linear i, omer i, reported for all other analFte, u

Sample ID: SKITMW506180430N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I .ncu
Project: Lapeer Sampling
Location: LRPHH4

Matrix: wroBndy ater
Date Collected: 50-Rpr-18 1v:10

Laboratory Data

Lab Sample: 1800896-0s
Date 4 eceiAed: 0F-Ma3-18 09:F8

ColBmn: EHG C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PJ ER	5vs-22-F	25uv	0u6s1	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ PeR	2v06-90-5	22u5	0u61v	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ ES	5vs-v5-s	9u9v	0u865	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ GxR	50v-2F-F	F8u8	1u0s	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ GpR	5vs-8s-9	20u8	0u28s	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ GxS	5ss-F6-F	1vus	0uFs6	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
6:2 J7S	2v619-9v-2	ND	0u96F	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ TR	55s-6v-1	8us8	0u61F	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ GpS	5vs-92-8	ND	0uFs2	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ TS	1v65-25-1	1su2	0u589	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ NR	5vs-9s-1	ND	0u590	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ DR	55s-v6-2	ND	0uv18	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
8:2 J7S	59108-5F-F	ND	0u995	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ TSR	vsF-91-6	ND	0u8s5	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
MeJ TSRR	25ss-51-9	ND	0uv9s	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ DS	55s-vv-5	ND	0us95	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ OnR	20s8-9F-8	ND	0us06	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
HtJ TSRR	2991-s0-6	ND	0u660	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ DoR	50v-ss-1	ND	0u582	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ 7rDR	v2629-9F-8	ND	0u258	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ 7eDR	5v6-06-v	ND	0u56F	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ NS	682s9-12-1	ND	1u8v	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
PJ PeS	2v06-91-F	2u2v	1u52	2uF1	5u86	U	E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
F:2 J7S	vsv12F-v2-F	ND	1u52	2uF1	5u86		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
15C5-PJ ER	.S	9vu0	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
15C5-PJ PeR	.S	95u9	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
15C5-PJ ES	.S	1s1	s0 - 1s0	G	E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
15C2-PJ GxR	.S	98u2	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
15CF-PJ GpR	.S	109	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
18T2-PJ GxS	.S	101	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
15C2-PJ TR	.S	86u6	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
15C8-PJ TS	.S	9vul	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
15Cs-PJ NR	.S	v6u5	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
15C2-PJ DR	.S	90u6	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
15C8-PJ TSR	.S	62us	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
d5-MeJ TSRR	.S	98ul	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
15C2-PJ OnR	.S	v9u2	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1

Sample ID: SKITMW506180430N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I .ncu
Project: Lapeer Sampling
Location: LRPHH4

Matrix: wroBndy ater
Date Collected: 50-Rpr-18 1v:10

Laboratory Data

Lab Sample: 1800896-0s
Date 4 eceiAed: 0F-Ma3-18 09:F8

ColBmn: EHG C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
ds-HtJ TSRR	.S	10s	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
15C2-PJ DoR	.S	vFu8	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1
15C2-PJ 7eDR	.S	v9u2	s0 - 1s0		E8H0080	10-Ma3-18	0u2s9 L	2s-Ma3-18 0s:F9	1

DL - Detection Limit
LTD - Limit of Detection
LTQ - Limit of qBantitation
LCL-OCL- Loy er control limit - Bpper control limit
4 e, Blt, reported to the DLu
When reportedI PJ GxSI PJ TR and PJ T S inclBde both linear and branched i, omer, u
T nl3 the linear i, omer i, reported for all other anal3te, u

Sample ID: SKITMW606180501N — **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: LF PEEv
Matrix: Groundwater
Date Collected: 01-May-18 08:5R

Laboratory Data

Lab Sample: 1800896-06
Date v ecei4ed: 0A-May-18 09:A8
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
P3BF	J2R-55-A	2.86	0.J61	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3PeF	5206-90-J	ND	0.6JR	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3BS	J2R-2J-R	A26	0.882	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3HxF	J02-5A-A	ND	1.08	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3HpF	J2R-8R-9	ND	0.59J	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3HxS	JRR-A6-A	0.69J	0.A20	5.A8	J.92	7	B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
6:5 3TS	52619-92-5	ND	0.995	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3OF	JJR-62-1	0.6A9	0.J5J	5.A8	J.92	7	B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3HpS	J2R-95-8	ND	0.A6R	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3OS	126J-5J-1	ND	0.A00	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3NF	J2R-9R-1	ND	0.A05	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3DF	JJR-26-5	ND	0.2J9	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
8:5 3TS	J9108-JA-A	ND	1.05	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3OSF	2RA-91-6	ND	0.828	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
Me3OSF F	5JRR-J1-9	ND	0.818	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3DS	JJR-22-J	ND	0.610	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3UnF	50R8-9A-8	ND	0.R51	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
Et3OSF F	5991-R0-6	ND	0.629	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3DoF	J02-RR-1	ND	0.J9J	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3TrDF	25659-9A-8	ND	0.5AR	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3TeDF	J26-06-2	ND	0.J2A	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3NS	685R9-15-1	ND	1.95	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
P3PeS	5206-91-A	ND	1.J6	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
A:5 3TS	2R215A-25-A	ND	1.J6	5.A8	J.92		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
1JCJ-P3BF	IS	100	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
1JCJ-P3PeF	IS	82.6	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
1JCJ-P3BS	IS	1JR	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
1JC5-P3HxF	IS	89.5	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
1JCA-P3HpF	IS	90.8	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
18O5-P3HxS	IS	109	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
1JC5-P3OF	IS	86.9	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
1JC8-P3OS	IS	9AA	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
1JCR-P3NF	IS	90.5	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
1JC5-P3DF	IS	110	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
1JC8-P3OSF	IS	R6.A	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
dJ-Me3OSF F	IS	151	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
1JC5-P3UnF	IS	96.2	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1

Sample ID: SKITMW606180501N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: LF PEEv

Matrix: Groundwater
Date Collected: 01-May-18 08:5R

Laboratory Data

Lab Sample: 1800896-06
Date v ecei4ed: 0A-May-18 09:A8

Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
dR-Et3 OSF F	IS	151	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
1J C5-P3 DoF	IS	10J	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1
1J C5-P3 TeDF	IS	91.R	R0 - 1R0		B8E0080	10-May-18	0.5R5 L	5R-May-18 0R:R9	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
v esults reported to the DL.

When reported, P3 HxS, P3 OF and P3 OS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: EB01-180426

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: LAPEER
Matrix: Water
Date Collected: 26-Apr-18 09:30

Laboratory Data

Lab Sample: 1800896-07
Date Received: 04-May-18 09:48
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.346	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFPeA	2706-90-3	ND	0.608	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFBS	375-73-5	ND	0.850	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFHxA	307-24-4	ND	1.04	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFHpA	375-85-9	ND	0.281	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFHxS	355-46-4	ND	0.450	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
6:2 FTS	27619-97-2	ND	0.950	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFOA	335-67-1	1.63	0.309	2.38	3.80	J	B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFHpS	375-92-8	ND	0.445	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFOS	1763-23-1	1.59	0.383	2.38	3.80	J	B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFNA	375-95-1	ND	0.385	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFDA	335-76-2	ND	0.708	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
8:2 FTS	39108-34-4	ND	0.979	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFOSA	754-91-6	ND	0.841	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
MeFOSAA	2355-31-9	ND	0.784	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFDS	335-77-3	ND	0.584	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFUnA	2058-94-8	ND	0.499	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
EtFOSAA	2991-50-6	ND	0.651	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFDoA	307-55-1	ND	0.376	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFTrDA	72629-94-8	ND	0.235	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFTeDA	376-06-7	ND	0.359	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFNS	68259-12-1	ND	1.84	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
PFPeS	2706-91-4	ND	1.30	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
4:2 FTS	757124-72-4	ND	1.30	2.38	3.80		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	92.8	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
13C3-PFPeA	IS	90.1	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
13C3-PFBS	IS	122	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
13C2-PFHxA	IS	92.1	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
13C4-PFHpA	IS	89.4	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
18O2-PFHxS	IS	96.2	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
13C2-PFOA	IS	84.1	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
13C8-PFOS	IS	97.8	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
13C5-PFNA	IS	87.3	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
13C2-PFDA	IS	56.1	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
13C8-PFOSA	IS	49.1	50 - 150	H	B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
d3-MeFOSAA	IS	85.2	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
13C2-PFUnA	IS	87.9	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1

Sample ID: EB01-180426 **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: LAPEER
Matrix: Water
Date Collected: 26-Apr-18 09:30

Laboratory Data

Lab Sample: 1800896-07
Date Received: 04-May-18 09:48
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	88.5	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
13C2-PFDoA	IS	64.0	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1
13C2-PFTeDA	IS	76.6	50 - 150		B8E0080	10-May-18	0.263 L	25-May-18 06:10	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: ECB01-842 **yPFS IAbtbpe Dilstibn u etMbh**

Client Data				6aLboatbor Data			
Name:	Merit Laboratories, Inc.	Matrix:	Water	Lab Sample:	1800896-08	Column:	BEH C18
Project:	Lapeer Sampling	Date Collected:	26-Apr-18 17:30	Date Received:	04-May-18 09:48		
Location:	LAPEER						

Fnalrte	CFS Nsm Leo	Cbndc.n(g6/	D6	6f D	6f E	Es ali)ieoA	z atdM	Oxtoadteh	Samp SiQe	FnalrQeh	Dilstibn
PFBA	375-22-4	ND	0.352	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFPeA	2706-90-3	ND	0.618	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFBS	375-73-5	ND	0.864	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFHxA	307-24-4	ND	1.05	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFHpA	375-85-9	ND	0.285	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFHxS	355-46-4	ND	0.457	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
6:2 FTS	27619-97-2	ND	0.965	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFOA	335-67-1	ND	0.314	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFHpS	375-92-8	ND	0.452	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFOS	1763-23-1	ND	0.389	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFNA	375-95-1	ND	0.391	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFDA	335-76-2	ND	0.719	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
8:2 FTS	39108-34-4	ND	0.994	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFOSA	754-91-6	ND	0.854	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
MeFOSAA	2355-31-9	ND	0.796	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFDS	335-77-3	ND	0.594	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFUnA	2058-94-8	ND	0.507	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
EtFOSAA	2991-50-6	ND	0.661	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFDoA	307-55-1	ND	0.382	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFTrDA	72629-94-8	ND	0.238	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFTeDA	376-06-7	ND	0.364	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFNS	68259-12-1	ND	1.87	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
PFPeS	2706-91-4	ND	1.32	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
4:2 FTS	757124-72-4	ND	1.32	2.41	3.86		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1

6aLeleh Stanhaoh A	Trpe	% Redbveor	6imitA	Es ali)ieoA	z atdM	Oxtoadteh	Samp SiQe	FnalrQeh	Dilstibn
13C3-PFBA	IS	92.1	50 - 150		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
13C3-PFPeA	IS	102	50 - 150		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
13C3-PFBS	IS	129	50 - 150		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
13C2-PFHxA	IS	97.1	50 - 150		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
13C4-PFHpA	IS	106	50 - 150		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
18O2-PFHxS	IS	98.7	50 - 150		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
13C2-PFOA	IS	84.4	50 - 150		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
13C8-PFOS	IS	93.9	50 - 150		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
13C5-PFNA	IS	85.0	50 - 150		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
13C2-PFDA	IS	75.9	50 - 150		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
13C8-PFOSA	IS	46.7	50 - 150	H	B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
d3-MeFOSAA	IS	82.4	50 - 150		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1
13C2-PFUnA	IS	70.9	50 - 150		B8E0080	10-May-18	0.259 L	25-May-18 06:20	1

Sample ID: ECB01-842 **yPFSIAbtbpe Dilstibn u etMbh**

Client Data				6aLboatbor Data			
Name:	Merit Laboratories, Inc.	Matrix:	Water	Lab Sample:	1800896-08	Column:	BEH C18
Project:	Lapeer Sampling	Date Collected:	26-Apr-18 17:30	Date Received:	04-May-18 09:48		
Location:	LAPEER						

6aLeleh StanhaohA	Trpe	% Redbveor	6imitA	Es ali)ieoA	z atdM	Oxtoadteh	Samp SiQe	FnalrQeh	Dilstibn
d5-EtFOSAA	IS	92.2	50 - 150	B8E0080	10-May-18	0.259 L	25-May-18 06:20	1	
13C2-PFDoA	IS	70.3	50 - 150	B8E0080	10-May-18	0.259 L	25-May-18 06:20	1	
13C2-PFTeDA	IS	84.2	50 - 150	B8E0080	10-May-18	0.259 L	25-May-18 06:20	1	

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: EB01-180427

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: L7 PEER

Matrix: Water
Date Collected: 2A-7 pr-18 06:30

Laboratory Data

Lab Sample: 1800896-09
Date Received: 04-May-18 09:48

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFB7	5A3-22-4	ND	0.5A4	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFPe7	2A06-90-5	ND	0.63A	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFBS	5A3-A5-3	ND	0.919	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFHx7	50A-24-4	ND	1.12	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFHp7	5A3-83-9	ND	0.504	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFHxS	533-46-4	ND	0.486	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
6:2 FTS	2A619-9A-2	ND	1.05	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFO7	553-6A-1	ND	0.554	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFHpS	5A3-92-8	ND	0.481	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFOS	1A65-25-1	ND	0.414	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFN7	5A3-93-1	ND	0.416	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFD7	553-A6-2	ND	0.A63	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
8:2 FTS	59108-54-4	ND	1.06	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFOS7	A34-91-6	ND	0.909	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
MeFOS7 7	2533-51-9	ND	0.84A	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFDS	553-AA-5	ND	0.652	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFUn7	2038-94-8	ND	0.359	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
EtFOS7 7	2991-30-6	ND	0.A04	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFDo7	50A-33-1	ND	0.40A	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFTrD7	A2629-94-8	ND	0.234	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFTeD7	5A6-06-A	ND	0.588	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFNS	68239-12-1	ND	1.99	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
PFPeS	2A06-91-4	ND	1.41	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
4:2 FTS	A3A124-A2-4	ND	1.41	2.3A	4.11		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
15C5-PFB7	IS	96.3	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
15C5-PFPe7	IS	98.0	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
15C5-PFBS	IS	124	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
15C2-PFHx7	IS	94.6	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
15C4-PFHp7	IS	103	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
18O2-PFHxS	IS	104	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
15C2-PFO7	IS	64.6	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
15C8-PFOS	IS	92.4	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
15C3-PFN7	IS	A3.3	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
15C2-PFD7	IS	61.8	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
15C8-PFOS7	IS	53.2	30 - 130	H	B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
d5-MeFOS7 7	IS	A2.1	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
15C2-PFUn7	IS	63.6	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1

Sample ID: EB01-180427 **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: L7 PEER

Matrix: Water
Date Collected: 2A-7 pr-18 06:30

Laboratory Data

Lab Sample: 1800896-09
Date Received: 04-May-18 09:48

Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d3-EtFOS7 7	IS	A2.6	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
15C2-PFDo7	IS	85.3	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1
15C2-PFTeD7	IS	A0.1	30 - 130		B8E0080	10-May-18	0.245 L	23-May-18 06:51	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFO7 and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: QC1-180430

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: LAPEE3
Matrix: Water
Date Collected: 20-Apr-18 17:20

Laboratory Data

Lab Sample: 1800896-10
Date 3eceiRed: 0v-Ma4-18 09:v8
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PyBA	275-FF-v	ND	0.2v6	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyPeA	F706-90-2	ND	0.608	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyBS	275-72-5	ND	0.850	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyHxA	207-Fv-v	ND	1.02	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyHpA	275-85-9	ND	0.F81	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyHxS	255-v6-v	ND	0.v50	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
6:F yTS	F7619-97-F	ND	0.9v9	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyOA	225-67-1	ND	0.209	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyHpS	275-9F-8	ND	0.vv5	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyOS	1762-F2-1	ND	0.282	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyNA	275-95-1	ND	0.28v	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyDA	225-76-F	ND	0.707	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
8:F yTS	29108-2v-v	ND	0.978	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyOSA	75v-91-6	ND	0.8v0	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
MeyOSAA	F255-21-9	ND	0.782	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyDS	225-77-2	ND	0.58v	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyUnA	F058-9v-8	ND	0.v98	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
EtyOSAA	F991-50-6	ND	0.650	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyDoA	207-55-1	ND	0.276	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyTrDA	7F6F9-9v-8	ND	0.F2v	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyTeDA	276-06-7	ND	0.258	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyNS	68F59-1F-1	ND	1.8v	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
PyPeS	F706-91-v	ND	1.20	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
v:F yTS	7571Fv-7F-v	ND	1.20	F.28	2.80		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
12C2-PyBA	IS	97.0	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
12C2-PyPeA	IS	92.F	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
12C2-PyBS	IS	1Fv	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
12CF-PyHxA	IS	92.v	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
12Cv-PyHpA	IS	99.7	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
18OF-PyHxS	IS	97.5	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
12CF-PyOA	IS	87.6	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
12C8-PyOS	IS	97.8	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
12C5-PyNA	IS	7v.6	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
12CF-PyDA	IS	9F.F	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
12C8-PyOSA	IS	25.1	50 - 150	H	B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
d2-MeyOSAA	IS	8F.7	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
12CF-PyUnA	IS	61.2	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1

Sample ID: QC1-180430 **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: LAPEE3
Matrix: Water
Date Collected: 20-Apr-18 17:20

Laboratory Data

Lab Sample: 1800896-10
Date 3eceiRed: 0v-Ma4-18 09:v8
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtyOSAA	IS	102	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
12CF-PyDoA	IS	99.5	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1
12CF-PyTeDA	IS	76.2	50 - 150		B8E0080	10-Ma4-18	0.F62 L	F5-Ma4-18 06:v1	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
3esults reported to the DL.
When reported, PyHxS, PyOA and PyOS include both linear and branched isomers.
Onl4 the linear isomer is reported for all other anal4tes.

Sample ID: Q1 - 8- 043L4 **FQAS Isrtrpe Dilutirn Methrd**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: LAPEE7

Matrix: Water
Date Collected: 20-Apr-18 18:00

baoryatryP Data

Lab Sample: 1800896-11
Date 7ecei3ed: 0R-Mav-18 09:R8

Column: BEH C18

AnalPte	CAS Numoey	Crnc. (ng/b)	Db	bBD	bBf	f ualizieys	1 atch	Extyacted	Samp SiOe	AnalPOed	Dilutirn
P4BA	2F5-yy-R	ND	0.2R6	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4PeA	yF06-90-2	ND	0.60F	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4BS	2F5-F2-5	ND	0.8R9	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4HxA	20F-yR-R	ND	1.02	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4HpA	2F5-85-9	ND	0.y80	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4HxS	255-R6-R	ND	0.RR9	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
6:y 4TS	yF619-9F-y	ND	0.9R8	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4OA	225-6F-1	ND	0.209	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4HpS	2F5-9y-8	ND	0.RRR	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4OS	1F62-y2-1	ND	0.282	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4NA	2F5-95-1	ND	0.28R	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4DA	225-F6-y	ND	0.F06	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
8:y 4TS	29108-2R-R	ND	0.9F6	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4OSA	F5R-91-6	ND	0.829	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
Me4OSAA	y255-21-9	ND	0.F8y	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4DS	225-FF-2	ND	0.582	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4UnA	y058-9R-8	ND	0.R98	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
Et4OSAA	y991-50-6	ND	0.6R9	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4DoA	20F-55-1	ND	0.2F5	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4TrDA	Fy6y9-9R-8	ND	0.y2R	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4TeDA	2F6-06-F	ND	0.258	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4NS	68y59-1y-1	ND	1.82	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
P4PeS	yF06-91-R	ND	1.20	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
R:y 4TS	F5F1yR-Fy-R	ND	1.20	y.2F	2.F9		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1

baoeled Standayds	TPpe	% RecrveyP	bimits	f ualizieys	1 atch	Extyacted	Samp SiOe	AnalPOed	Dilutirn
12C2-P4BA	IS	92.F	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
12C2-P4PeA	IS	8F.2	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
12C2-P4BS	IS	110	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
12Cy-P4HxA	IS	92.F	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
12CR-P4HpA	IS	90.6	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
18Oy-P4HxS	IS	102	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
12Cy-P4OA	IS	FF.y	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
12C8-P4OS	IS	92.y	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
12C5-P4NA	IS	80.6	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
12Cy-P4DA	IS	F5.9	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
12C8-P4OSA	IS	R9.R	50 - 150	H	B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
d2-Me4OSAA	IS	F5.5	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
12Cy-P4UnA	IS	66.y	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1

Sample ID: Q1 - 8- 043L4 **FQAS Isrtrpe Dilutirn Methrd**

Client Data				baoryatryP Data			
Name:	Merit Laboratories, Inc.	Matrix:	Water	Lab Sample:	1800896-11	Column:	BEH C18
Project:	Lapeer Sampling	Date Collected:	20-Apr-18 18:00	Date 7ecei3ed:	0R-Mav-18 09:R8		
Location:	LAPEE7						

baoeled Standayds	TPpe	% RecrveyP	bimits	f ualizieys	1atch	Extyacted	Samp SiQe	AnalPQed	Dilutirn
d5-Et4OSAA	IS	F1.0	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
12Cy-P4DoA	IS	68.0	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1
12Cy-P4TeDA	IS	65.6	50 - 150		B8E0080	10-Mav-18	0.y6RL	y5-Mav-18 06:5y	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
7esults reported to the DL.
When reported, P4HxS, P4OA and P4OS include both linear and branched isomers.
Onlv the linear isomer is reported for all other analytes.

Sample ID: Q1 - 8-043L4 **FAs S Iurtrpe DilMirn h etdrc**

Client Data

Name: Merit Laboratorie, I .ncu
Project: Lapeer Sampling
Location: L7 PHHR

Matrix: 2 ater
Date Collected: A0-7 pr-18 18:03

baoryatryP Data

Lab Sample: 1800896-1s
Date Received: 04-May-18 09:48

ColBmn: EHWC18

s nalPte	Cs S NMmoey	Crn. (gn/)bf	Db	bED	bEz	z MaliGeyu	1 at. d	Qxtya. tec	Samp SiBe	s nalPBec	DilMirn
PFE7	A53-ss-4	ND	0uA46	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFPe7	s506-90-A	ND	0u608	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFES	A53-5A-3	ND	0u830	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFWx7	A05-s4-4	ND	1u04	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFWp7	A53-83-9	ND	0us81	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFWxS	A33-46-4	ND	0u430	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
6:s FTS	s5619-95-s	ND	0u930	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFO7	AA3-65-1	ND	0uA09	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFWpS	A53-9s-8	ND	0u443	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFOS	156A-sA-1	ND	0uA8A	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFN7	A53-93-1	ND	0uA83	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFD7	AA3-56-s	ND	0u508	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
8:s FTS	A9108-A4-4	ND	0u958	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFOS7	534-91-6	ND	0u841	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
MeFOS7 7	sA33-A1-9	ND	0u584	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFDS	AA3-55-A	ND	0u384	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFUn7	s038-94-8	ND	0u499	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
HtFOS7 7	s991-30-6	ND	0u631	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFDo7	A05-33-1	ND	0uA56	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFTrD7	5s6s9-94-8	ND	0usA3	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFTeD7	A56-06-5	ND	0uA39	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFNS	68s39-1s-1	ND	1u84	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
PFPeS	s506-91-4	ND	1uA0	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
4:s FTS	5351s4-5s-4	ND	1uA0	suA8	Au80		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1

baoelec Stancaycu	TPpe	% Re. rveyP	bimitu	z MaliGeyu	1 at. d	Qxtya. tec	Samp SiBe	s nalPBec	DilMirn
1ACA-PFE7	.S	9Au9	30 - 130		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
1ACA-PFPe7	.S	95u0	30 - 130		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
1ACA-PFES	.S	108	30 - 130		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
1ACs-PFWx7	.S	96u0	30 - 130		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
1AC4-PFWp7	.S	101	30 - 130		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
18Os-PFWxS	.S	100	30 - 130		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
1ACs-PFO7	.S	86us	30 - 130		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
1AC8-PFOS	.S	104	30 - 130		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
1AC3-PFN7	.S	86u4	30 - 130		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
1ACs-PFD7	.S	84u8	30 - 130		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
1AC8-PFOS7	.S	36uA	30 - 130		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
dA-MeFOS7 7	.S	51u5	30 - 130		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1
1ACs-PFUn7	.S	58u9	30 - 130		E8H0080	10-May-18	0us6AL	s3-May-18 05:0s	1

Sample ID: Q1 - 8-043L4 **FAs S Iurtrpe DilMirn h etdrc**

Client Data				baoryatryP Data			
Name:	Merit Laboratorie, I .ncu	Matrix:	2 ater	Lab Sample:	1800896-1s	ColBmn:	EHWC18
Project:	Lapeer Sampling	Date Collected:	A0-7 pr-18 18:03	Date Received:	04-May-18 09:48		
Location:	L7 PHHR						

baoelec Stancaycu	TPpe	% Re. rveyP	bimitu	z MaliQeyu	1 at. d	Qxtya. tec	Samp SiBe	s nalPBec	DilMirn
d3-HtFOS7 7	.S	83uA	30 - 130		E8H0080	10-May-18	0us 6AL	s3-May-18 05:0s	1
1ACs-PFDo7	.S	51u0	30 - 130		E8H0080	10-May-18	0us 6AL	s3-May-18 05:0s	1
1ACs-PFTeD7	.S	64u6	30 - 130		E8H0080	10-May-18	0us 6AL	s3-May-18 05:0s	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of qBantitation
LCL-UCL- Lower control limit - Bpper control limit
Re, Blt, reported to the DLu
2 hen reportedI PFWxSI PFO7 and PFOS inclBde both linear and branched i, omer, u
Only the linear i, omer i, reported for all other analyte, u

Vista Analytical Laboratory

Sample ID: FB1-180502

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratorie, I .ncu
Project: Lapeer Sampling
Location: L4 PHH3

Matrix: 2 ater
Date Collected: 0A-Ma7-18 16:A0

Laboratory Data

Lab Sample: 1800896-1s
Date 3 eceiRed: 0v-Ma7-18 09:v8

ColBmn: EHWC18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PyE4	s5F-AA-v	ND	0usF6	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyPe4	A506-90-s	ND	0u6AF	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyES	s5F-5s-F	ND	0u85v	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyWx4	s05-Av-v	ND	1u06	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyWp4	s5F-8F-9	ND	0uA89	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyWxS	sFF-v6-v	ND	0uv6s	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
6:AyTS	A5619-95-A	ND	0u955	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyO4	ssF-65-1	ND	0us18	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyWpS	s5F-9A-8	ND	0uvF8	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyOS	156s-As-1	ND	0us9v	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyN4	s5F-9F-1	ND	0us96	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyD4	ssF-56-A	ND	0u5A8	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
8:AyTS	s9108-sv-v	ND	1u01	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyOS4	5Fv-91-6	ND	0u86F	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
MeyOS4 4	AsFF-s1-9	ND	0u806	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyDS	ssF-55-s	ND	0u601	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyUn4	A0F8-9v-8	ND	0uF1s	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
HtyOS4 4	A991-F0-6	ND	0u669	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyDo4	s05-FF-1	ND	0us85	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyTrD4	5A6A9-9v-8	ND	0uAv1	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyTeD4	s56-06-5	ND	0us69	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyNS	68AF9-1A-1	ND	1u89	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
PyPeS	A506-91-v	ND	1usv	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
v:AyTS	5F51Av-5A-v	ND	1usv	Auvv	su91		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
1sCs-PyE4	.S	9vu9	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
1sCs-PyPe4	.S	101	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
1sCs-PyES	.S	10A	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
1sCA-PyWx4	.S	109	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
1sCv-PyWp4	.S	105	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
18OA-PyWxS	.S	9vul	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
1sCA-PyO4	.S	89u6	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
1sC8-PyOS	.S	99u9	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
1sCF-PyN4	.S	8vu6	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
1sCA-PyD4	.S	9vu5	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
1sC8-PyOS4	.S	F6uA	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
ds-MeyOS4 4	.S	88uv	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
1sCA-PyUn4	.S	89ul	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1

Sample ID: FB1-180502 **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I .ncu
Project: Lapeer Sampling
Location: L4 PHH3

Matrix: 2 ater
Date Collected: 0A-Ma7-18 16:A0

Laboratory Data

Lab Sample: 1800896-1s
Date 3 eceiRed: 0v-Ma7-18 09:v8

ColBmn: EHWC18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
dF-HtyOS4 4	.S	96u8	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
1sCA-PyDo4	.S	5Fu8	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1
1sCA-PyTeD4	.S	8vu6	F0 - 1F0		E8H01F9	18-Ma7-18	0uAF6 L	Av-Ma7-18 11:v9	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of qBantitation
LCL-UCL- Lower control limit - Bpper control limit
3 e, Blt, reported to the DLu
2 hen reportedI PyWxSI PyO4 and PyOS inclBde both linear and branched i, omer, u
Onl7 the linear i, omer i, reported for all other anal7te, u

DATA QUALIFIERS & ABBREVIATIONS

B	**This compound was also detected in the method blank**
Conc.	**Concentration**
D	**Dilution**
DL	**Detection limit**
E	**The associated compound concentration exceeded the calibration range of the instrument**
H	**Recovery and/or RPD was outside laboratory acceptance limits**
I	**Chemical Interference**
J	**The amount detected is below the Reporting Limit/LOQ**
LOD	**Limits of Detection**
LOQ	**Limits of Quantitation**
M	**Estimated Maximum Possible Concentration (CA Region 2 projects only)**
NA	**Not applicable**
ND	**Not Detected**
Q	**Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)**
TEQ	**Toxic Equivalency**
U	**Not Detected (specific projects only)**
*****	**See Cover Letter**

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

CERTIFICATIONS

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	17-015-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-18
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2016026
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207717
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-008
Pennsylvania Department of Environmental Protection	014
Texas Commission on Environmental Quality	T104704189-17-8
Virginia Department of General Services	9077
Washington Department of Ecology	C584
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.

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800896 Temp: 0.2 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: LAPEER SAMPLING PO#: 60570309 Sampler: John Yanchula (name)

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

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

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
John Yanchula	5/3/18	1830	FED EX		
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
FED EX			Kim Elric	05/04/18	10:14

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

ATTN: Jennifer Miller

Method of Shipment:

Tracking No.:

Add Analysis(es) Requested

Container(s): Quantity, Type, Matrix

PFAS Isotope Dilution: List of 21, List of 21 w/Isomers, List of 24, List of 24 w/Isomers, List of 28, Other: Please List Below

USEPA Method 537: PFOA/PFOS, UCMR3 PFAS List:6, PFAS List: 14

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	PFOA/PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
SKITMW113180501N	5/1/18	1105	LAPEER	2		GW			X							
SKITMW211180501N	5/1/18	1230	LAPEER	2		GW			X							
SKITMW308180430N	4/30/18	1525	LAPEER	2		GW			X							
SKITMW411180430N	4/30/18	1335	LAPEER	2		GW			X							
SKITMW506180430N	4/30/18	1710	LAPEER	2		GW			X							
SKITMW606180501N	5/1/18	0825	LAPEER	2		GW			X							

Special Instructions/Comments: Send Results and Acknowledgements to the list provided by e-mail to Vista.

SEND DOCUMENTATION AND RESULTS TO:
Name: Stephanie Kammer
Company: MDEQ
Address: 525 W. Allegan Stree
City: Lansing State: MI Zip: 48909
Phone: 517-897-1597 Fax: 517-241-3571
Email: dorin.bogdan@aecom.com

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

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

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

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800896 Temp: 0.2°C °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: LAPEER SAMPLING PO#: 60570309 Sampler: John Yanchula (name)

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

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

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
JOHN YANCHULA John Yanchula	5/3/18	1830	FED EX		
FED EX			KIM ELRIC	05/4/18	1014

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

ATTN: Jennifer Miller

Method of Shipment: FED EX

Tracking No.:

Add Analysis(es) Requested

Container(s)

PFAS Isotope Dilution

USEPA Method 537

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
EB01-180426	4/26/18	0930	LAPEER	2		W			X							
QC-180426	4/26/18	1730	LAPEER	2		W			X							
EBD1-180427	4/27/18	0650	LAPEER	2		W			X							
QC1-180436	4/30/18	1730	LAPEER	2		W			X							
FB1-~~043018~~ 180430	4/30/18	1800	LAPEER	2		W			X							
EB1-~~0430~~ 180430	4/3/18	1805	LAPEER	2		W			X							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:

Name: Stephanie Kammer
Company: MDEQ
Address: 525 W. Allegan Stree
City: Lansing State: MI Zip: 48909
Phone: 517-897-1597 Fax: 517-241-3571
Email: dorin.bogdan@aecom.com

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

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

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

Vista Analytical Laboratory

Sample Log-in Checklist

Vista Work Order #: 1800896 **TAT** STD

Samples Arrival:	**Date/Time** 05/04/18 0948	**Initials:** KE	**Location:** WR-2 **Shelf/Rack:**
Logged In:	**Date/Time** 0758 05/08/18 843 KE 05/04/18	**Initials:** KE	**Location:** WR-2 **Shelf/Rack:** A-4

Delivered By:	FedEx	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	Ice		Blue Ice		Dry Ice		None

Temp °C: 0.3 (uncorrected)	**Time:** 10:13	**Thermometer ID:** IR-4
Temp °C: 0.2 (corrected)	**Probe used:** Yes☐ No☑	

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Shipping Documentation Present?	✓		
Airbill 1 of 3 Trk # 7808 1407 5838	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			-
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?	✓		✓ KE 05/08/18

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

Comments:

AQ EBI-180430
EBO1-180427
EBO1-180426
FBI-180430
• FBI-18050

QC-180426
QC1-180430
SKITMW113180501N
SKITMW211180501N
SKITMW308180430N

SKITMW410180430N
SKITMW506180430N
SKITMW606180501N

NOT ON COC's.

Chain of Custody Anomaly/Sample Acceptance Form

Vista Analytical Laboratory

Client:	Merit Laboratories, Inc.	Workorder Number:	1800896
Contact:	Maya Murshak	Date Received:	04-May-18 09:48
Email:	mayamurshak@meritlabs.com	Documented by/date:	Kim Elric 05/08/18
Phone:	(517) 827-2744		

Please review the following information and complete the Client Authorization section. To comply with NELAC regulations, we must receive authorization before proceeding with sample analysis.

Thank you,

Martha Maier
mmaier@vista-analytical.com
916-673-1520

The following information or item is needed to proceed with analysis:

- [ ] Complete Chain-of-Custody
- [ ] Test Method Requested
- [ ] Analyte List Requested
- [X] Other: **See Comments**
- [ ] Preservative
- [ ] Sample Identification
- [ ] Sample Collection Date and/or Time
- [ ] Collector's Name
- [ ] Sample Type
- [ ] Sample Location

The following anomalies were noted. Authorization is needed to proceed with analysis.

- [ ] Temperature outside < 6°C Range — Samples Affected: _____
  Temperature _____°C Ice Present? Yes No Melted
- [ ] Sample ID Discrepancy
- [ ] Sample Holding Time Missed
- [ ] Custody Seals Broken
- [ ] Insufficient Sample Size
- [ ] Sample Container(s) Broken
- [ ] Incorrect Container Type

Comments:

COC lists:	Samples:
EB01-180426	EB01-180426
QC-180426	QC-180426
EB01-180427	EB01-180427
QC1-180430	QC1-180430
FB1-180430	FB1-180430
EB1-180430	EB1-180430
	FB1-180502

Client Authorization

Proceed with Analysis: (YES) NO Signature and Date [signature] 05/16/18

Client Comments/Instructions PLEASE ADD FB1-180502 TO THE COC.

June 14, 2018

Vista Work Order No. 1800899

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 May 04, 2018. This sample set was analyzed on a standard turn-around time, under your Project Name 'Lapeer Sampling'.

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

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

Sincerely,

Martha Maier
Laboratory Director

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

Vista Work Order No. 1800899
Case Narrative

Sample Condition on Receipt:

Nine soil 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. Two sample ID discrepancies were resolved as directed: the samples listed as "SKIDU10100180427N" were reported as "SKIDU10200180427N" and "SKIDU10300180427N", as listed on the bottle labels.

Analytical Notes:

VAL-PFAS

The soils were dried and homogenzied following Vista's Incremental Sampling Procedure. The subsamples were extracted and analyzed for a selected list of PFAS using VAL Method PFAS.

Quality Control

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

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

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

QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
B8F0058-BLK1	B8F0058-BLK1	VAL - PFAS	13C8-PFOSA	H	30.9
B8F0058-BS1	B8F0058-BS1	VAL - PFAS	13C8-PFOSA	H	31.9

H = Recovery was outside laboratory acceptance criteria.

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800899-01	SKIDU30300180427N	ISM27-Apr-18 11:00	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800899-02	SKIDU30200180427N	ISM27-Apr-18 12:00	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800899-03	SKIDU30100180427N	ISM27-Apr-18 13:00	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800899-04	SKIDU20100180427N	ISM27-Apr-18 13:45	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800899-05	SKIDU20200180427N	ISM27-Apr-18 14:15	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800899-06	SKIDU20300180427N	ISM27-Apr-18 15:30	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800899-07	SKIDU10100180427N	ISM27-Apr-18 17:05	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800899-08	SKIDU10200180427N	ISM27-Apr-18 17:35	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz

Vista Project: 1800899

Client Project: Lapeer Sampling

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800899-08	SKIDU10200180427N	ISM27-Apr-18 17:35	04-May-18 09:48	HDPE Bottle, 1L
1800899-09	SKIDU10300180427N	ISM27-Apr-18 18:10	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L

ANALYTICAL RESULTS

Sample ID: Method Blank

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Matrix: Solid

Laboratory Data

Lab Sample: B8F0058-BLK1
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.140	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFPeA	2706-90-3	ND	0.202	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFBS	375-73-5	ND	0.363	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFHxA	307-24-4	ND	0.203	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFHpA	375-85-9	ND	0.205	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFHxS	355-46-4	ND	0.310	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
6:2 FTS	27619-97-2	ND	0.229	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFOA	335-67-1	ND	0.236	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFHpS	375-92-8	ND	0.170	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFOS	1763-23-1	ND	0.845	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFNA	375-95-1	ND	0.178	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFDA	335-76-2	ND	0.256	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
8:2 FTS	39108-34-4	ND	0.285	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFOSA	754-91-6	ND	0.227	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
MeFOSAA	2355-31-9	ND	0.302	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFDS	335-77-3	ND	0.201	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFUnA	2058-94-8	ND	0.354	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
EtFOSAA	2991-50-6	ND	0.321	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFDoA	307-55-1	ND	0.276	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFTrDA	72629-94-8	ND	0.122	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFTeDA	376-06-7	ND	0.198	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFNS	68259-12-1	ND	1.43	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
PFPeS	2706-91-4	ND	0.845	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
4:2 FTS	757124-72-4	ND	0.845	1.00	2.00		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	90.1	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
13C3-PFPeA	IS	93.8	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
13C3-PFBS	IS	101	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
13C2-PFHxA	IS	94.9	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
13C4-PFHpA	IS	81.8	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
18O2-PFHxS	IS	92.1	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
13C2-PFOA	IS	85.9	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
13C8-PFOS	IS	88.4	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
13C5-PFNA	IS	84.1	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
13C2-PFDA	IS	77.2	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
13C8-PFOSA	IS	30.9	50 - 150	H	B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
d3-MeFOSAA	IS	59.4	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
13C2-PFUnA	IS	83.5	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1

Sample ID: Method Blank

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Matrix: Solid

Laboratory Data

Lab Sample: B8F0058-BLK1
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	64.4	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
13C2-PFDoA	IS	86.6	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1
13C2-PFTeDA	IS	106	50 - 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:38	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: OPR **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Matrix: Solid

Laboratory Data

Lab Sample: B8F0058-BS1
Column: BEH C18

Analyte	CAS Number	Amt Found (ng/g)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	9.69	10.0	96.9	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFPeA	2706-90-3	9.26	10.0	92.6	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFBS	375-73-5	9.45	10.0	94.5	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFHxA	307-24-4	9.35	10.0	93.5	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFHpA	375-85-9	9.55	10.0	95.5	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFHxS	355-46-4	11.5	10.0	115	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
6:2 FTS	27619-97-2	10.7	10.0	107	60 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFOA	335-67-1	9.85	10.0	98.5	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFHpS	375-92-8	10.1	10.0	101	60 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFOS	1763-23-1	9.13	10.0	91.3	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFNA	375-95-1	9.28	10.0	92.8	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFDA	335-76-2	9.32	10.0	93.2	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
8:2 FTS	39108-34-4	9.84	10.0	98.4	60 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFOSA	754-91-6	10.4	10.0	104	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
MeFOSAA	2355-31-9	9.69	10.0	96.9	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFDS	335-77-3	9.82	10.0	98.2	60 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFUnA	2058-94-8	11.4	10.0	114	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
EtFOSAA	2991-50-6	10.1	10.0	101	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFDoA	307-55-1	9.26	10.0	92.6	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFTrDA	72629-94-8	10.9	10.0	109	60 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFTeDA	376-06-7	7.56	10.0	75.6	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFNS	68259-12-1	9.61	10.0	96.1	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
PFPeS	2706-91-4	8.86	10.0	88.6	70 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
4:2 FTS	757124-72-4	11.5	10.0	115	60 - 130		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	88.9	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
13C3-PFPeA	IS	93.5	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
13C3-PFBS	IS	105	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
13C2-PFHxA	IS	92.0	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
13C4-PFHpA	IS	84.2	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
18O2-PFHxS	IS	91.7	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
13C2-PFOA	IS	99.5	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
13C8-PFOS	IS	84.5	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
13C5-PFNA	IS	87.1	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
13C2-PFDA	IS	74.9	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1

Sample ID: OPR **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Matrix: Solid

Laboratory Data

Lab Sample: B8F0058-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOSA	IS	31.9	50- 150	H	B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
d3-MeFOSAA	IS	56.1	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
13C2-PFUnA	IS	75.2	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
d5-EtFOSAA	IS	60.4	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
13C2-PFDoA	IS	77.5	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1
13C2-PFTeDA	IS	117	50- 150		B8F0058	10-Jun-18	1.00 g	14-Jun-18 02:28	1

Sample ID: SKIDU30300180427N **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e33-SK01
Matrix: Soil
Date Collected: 27-Apr-18 11:00

Laboratory Data

Lab Sample: 1800899-01
Date Received: 04-May-18 09:48
% Solids: 98.4
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.131	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFPeA	2706-90-3	ND	0.188	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFBS	375-73-5	ND	0.338	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFHxA	307-24-4	ND	0.189	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFHpA	375-85-9	ND	0.191	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFHxS	355-46-4	ND	0.289	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
6:2 FTS	27619-97-2	ND	0.214	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFOA	335-67-1	ND	0.220	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFHpS	375-92-8	ND	0.159	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFOS	1763-23-1	1.48	0.788	0.932	1.86	J	B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFNA	375-95-1	ND	0.166	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFDA	335-76-2	ND	0.239	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
8:2 FTS	39108-34-4	ND	0.266	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFOSA	754-91-6	ND	0.212	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
MeFOSAA	2355-31-9	ND	0.282	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFDS	335-77-3	0.674	0.187	0.932	1.86	J	B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFUnA	2058-94-8	ND	0.330	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
EtFOSAA	2991-50-6	ND	0.299	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFDoA	307-55-1	ND	0.257	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFTrDA	72629-94-8	ND	0.114	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFTeDA	376-06-7	ND	0.185	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFNS	68259-12-1	ND	1.33	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
PFPeS	2706-91-4	ND	0.788	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
4:2 FTS	757124-72-4	ND	0.788	0.932	1.86		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.2	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
13C3-PFPeA	IS	100	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
13C3-PFBS	IS	96.6	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
13C2-PFHxA	IS	103	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
13C4-PFHpA	IS	88.7	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
18O2-PFHxS	IS	104	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
13C2-PFOA	IS	103	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
13C8-PFOS	IS	91.7	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
13C5-PFNA	IS	80.5	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
13C2-PFDA	IS	88.2	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
13C8-PFOSA	IS	79.4	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
d3-MeFOSAA	IS	68.1	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
13C2-PFUnA	IS	96.1	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1

Sample ID: SKIDU30300180427N **VAL - PFAS**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Lapeer Sampling	Date Collected:	27-Apr-18 11:00
Location:	08n11e33-SK01		

Laboratory Data

Lab Sample:	1800899-01	Column:	BEH C18
Date Received:	04-May-18 09:48		
% Solids:	98.4		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	72.7	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
13C2-PFDoA	IS	96.3	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1
13C2-PFTeDA	IS	132	50 - 150		B8F0058	10-Jun-18	1.09 g	14-Jun-18 02:49	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: SKIDU30100840217N **VAL - PFAS**

Client Data

Name: Merit Laboratorie, I .nc4
Project: Lapeer Sampling
Location: 08n11eKK-SF 01

Matrix: Soil
Date Collected: %7-Apr-18 1%00

Laboratory Data

Lab Sample: 1800899-0%
Date Received: 0y-Ma3-18 09:y8
s Solid, :

ColBmn: EH2 C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
P6EA	K7u-%%y	ND	04l08	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6PeA	%70J-90-K	ND	04luu	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6ES	K7u-7K-u	ND	04%79	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P62 xA	K07-%y-y	ND	04luJ	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P62 pA	K7u-8u-9	ND	04lu8	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P62 xS	Kuu-yJ-y	ND	04%K8	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
J:%6TS	%7J19-97-%	14y%	04l7J	047J9	14uy	5	E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6OA	KKu-J7-1	ND	04l8%	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P62 pS	K7u-9%8	ND	04lK1	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6OS	17JK-%K-1	%4l1	04lu0	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6NA	K7u-9u-1	ND	04lK7	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6DA	KKu-7J-%	04%8J	04l97	047J9	14uy	5	E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
8:%6TS	K9108-Ky-y	ND	04%d9	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6OSA	7uy-91-J	ND	04l7u	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
Me6OSAA	%Kuu-K1-9	ND	04%K%	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6DS	KKu-77-K	14lK	04luu	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6UnA	%0u8-9y-8	ND	04%7%	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
Ht6OSAA	%991-u0-J	ND	04%y7	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6DoA	K07-uu-1	ND	04%1%	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6TrDA	7%J%9-9y-8	ND	0409K8	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6TeDA	K7J-0J-7	ND	04lu%	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6NS	J8%u9-1%1	ND	14l0	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
P6PeS	%70J-91-y	ND	04lu0	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
y:%6TS	7u71%y-7%y	ND	04lu0	047J9	14uy		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
1KCK-P6EA	.S	904l	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
1KCK-P6PeA	.S	9u4u	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
1KCK-P6ES	.S	9%4u	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
1KC%P62 xA	.S	994%	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
1KCy-P62 pA	.S	8u4%	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
18O%P62 xS	.S	814u	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
1KC%P6OA	.S	914K	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
1KC8-P6OS	.S	8J4y	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
1KCu-P6NA	.S	8K49	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
1KC%P6DA	.S	8740	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
1KC8-P6OSA	.S	uJ4y	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
dK-Me6OSAA	.S	uJ4l	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
1KC%P6UnA	.S	794l	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1

Sample ID: SKIDU30100840217N **VAL - PFAS**

Client Data

Name: Merit Laboratorie, I .nc4
Project: Lapeer Sampling
Location: 08n11eKK-SF 01

Matrix: Soil
Date Collected: %7-Apr-18 1%00

Laboratory Data

Lab Sample: 1800899-0%
Date Received: 0y-Ma3-18 09:y8
s Solid, :

ColBmn: EH2 C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
du-Ht6OSAA	.S	u747	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
1KC%P6DoA	.S	984y	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1
1KC%P6TeDA	.S	11K	u0 - 1u0		E8600u8	10-5Bn-18	14K%g	1y-5Bn-18 0%u9	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of qBantitation
LCL-UCL- Lower control limit - Bpper control limit
The re, Blt, are reported in dr3 weight4
The , ample , ize i, reported in wet weight4
Re, Blt, reported to the DL4
When reportedI P62 xSI P6OA and P6OS inclBde both linear and branched i, omer, 4
Onl3 the linear i, omer i, reported for all other anal3te, 4

Sample ID: SKIDU30100180427N **VAL - PFAS**

Client Data

Name: Merit Laboratorie, I .nc4
Project: Lapeer Sampling
Location: 08n11e%%SK01

Matrix: Soil
Date Collected: 7u-Apr-18 1%00

Laboratory Data

Lab Sample: 1800899-0%
Date Received: 0y-Ma3-18 09:y8
s Solid, :

ColBmn: EH2 C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFEA	%u6-77-y	ND	041 18	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFPeA	7u0J-90-%	ND	041u1	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFES	%u6-u%6	ND	04%0u	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PF2 xA	%0u-7y-y	ND	041u7	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PF2 pA	%u6-86-9	ND	041u%	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PF2 xS	%66-yJ-y	ND	047J7	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
J:7 FTS	7uJ19-9u-7	ND	0419y	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFOA	%%6-Ju-1	ND	04199	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PF2 pS	%u6-97-8	ND	041yy	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFOS	1uJ%7%1	14%u	04u1y	048y6	149	5	E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFNA	%u6-96-1	ND	04160	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFDA	%%6-uJ-7	ND	0471J	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
8:7 FTS	%9108-%y-y	ND	047y1	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFOSA	u6y-91-J	ND	04197	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
MeFOSAA	7%66-%1-9	ND	04766	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFDS	%%6-uu-%	04570	041u0	048y6	149	5	E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFUnA	7068-9y-8	ND	04799	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
HtFOSAA	7991-60-J	ND	047u1	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFDoA	%0u-66-1	ND	047%%	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFTrDA	u7J79-9y-8	ND	0410%	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFTeDA	%uJ-0J-u	ND	041Ju	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFNS	J8769-17-1	ND	1471	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
PFPeS	7u0J-91-y	ND	04u1y	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
y:7 FTS	u6u17y-u7-y	ND	04u1y	048y6	149		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
1%C%PFEA	.S	894%	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
1%C%PFPeA	.S	964%	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
1%C%PFES	.S	904y	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
1%C7-PF2 xA	.S	9y48	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
1%Cy-PF2 pA	.S	8u47	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
18O7-PF2 xS	.S	8y41	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
1%C7-PFOA	.S	8%4%	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
1%C8-PFOS	.S	964%	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
1%C6-PFNA	.S	814%	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
1%C7-PFDA	.S	uu4%	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
1%C8-PFOSA	.S	6%4%	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
d%MeFOSAA	.S	J%4%	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
1%C7-PFUnA	.S	u64y	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1

Sample ID: SKIDU30100180427N **VAL - PFAS**

Client Data

Name: Merit Laboratorie, I .nc4
Project: Lapeer Sampling
Location: 08n11e%%SK01

Matrix: Soil
Date Collected: 7u-Apr-18 1%00

Laboratory Data

Lab Sample: 1800899-0%
Date Received: 0y-Ma3-18 09:y8
s Solid, :

ColBmn: EH2 C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d6-HtFOSAA	.S	J%6	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
1%C7-PFDoA	.S	u84y	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1
1%C7-PFTeDA	.S	11J	60 - 160		E8F0068	10-5Bn-18	1471 g	1y-5Bn-18 0%10	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of qBantitation
LCL-UCL- Lower control limit - Bpper control limit
The re, Blt, are reported in dr3 weight4
The , ample , ize i, reported in wet weight4
Re, Blt, reported to the DL4
When reportedI PF2 xSI PFOA and PFOS inclBde both linear and branched i, omer, 4
Onl3 the linear i, omer i, reported for all other anal3te, 4

Sample ID: SKIDU20100180427N **VAL - PFAS**

Client Data

Name: Merit Laboratorie, I .nc4
Project: Lapeer Sampling
Location: 08n11eRR-SF 01

Matrix: Soil
Date Collected: 27-Apr-18 1R:%v

Laboratory Data

Lab Sample: 1800899-0%
Date y ecei3ed: 0%MaK-18 09:%8
s Solid, :

Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
P6BA	R7v-22-%	ND	041%1	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6PeA	2705-90-R	ND	0420R	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6BS	R7v-7R-v	ND	04R5v	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6HxA	R07-2%%	ND	0420%	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6HpA	R7v-8v-9	ND	0405	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6HxS	Rvv-%5-%	ND	04R12	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
5:2 6TS	27519-97-2	1405	042R0	1401	2401	J	B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6OA	RRv-57-1	ND	042R7	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6HpS	R7v-92-8	ND	04171	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6OS	175R-2R-1	54v5	048v0	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6NA	R7v-9v-1	ND	04179	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6DA	RRv-75-2	ND	042v8	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
8:2 6TS	R9108-R%%	ND	04287	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6OSA	7v%91-5	ND	04228	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
Me6OSAA	2Rvv-R1-9	ND	04R0%	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6DS	RRv-77-R	0487 2	0402	1401	2401	J	B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6UnA	20v8-9%8	ND	04Rv5	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
Et6OSAA	2991-v0-5	ND	04R2R	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6DoA	R07-vv-1	ND	0427 8	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6TrDA	72529-9%8	ND	0412R	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6TeDA	R75-05-7	ND	04199	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6NS	582v9-12-1	ND	14/8%	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
P6PeS	2705-91-%	ND	048v0	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
%2 6TS	7v712%72-%	ND	048v0	1401	2401		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
1RCR-P6BA	.S	854R	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
1RCR-P6PeA	.S	9140	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
1RCR-P6BS	.S	8745	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
1RC2-P6HxA	.S	8v40	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
1RC%P6HpA	.S	784R	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
18O2-P6HxS	.S	7545	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
1RC2-P6OA	.S	8542	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
1RC8-P6OS	.S	8%48	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
1RCv-P6NA	.S	8R47	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
1RC2-P6DA	.S	7940	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
1RC8-P6OSA	.S	504v	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
dR-Me6OSAA	.S	554%	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1
1RC2-P6UnA	.S	854v	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%1	1

Sample ID: SKIDU20100180427N **VAL - PFAS**

Client Data

Name: Merit Laboratorie, I .nc4
Project: Lapeer Sampling
Location: 08n11eRR-SF 01

Matrix: Soil
Date Collected: 27-Apr-18 1R:%v

Laboratory Data

Lab Sample: 1800899-0%
Date y ecei3ed: 0%MaK-18 09:%8
s Solid, :

Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
dv-Et6OSAA	.S	594	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%d	1
1RC2-P6DoA	.S	8R48	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%d	1
1RC2-P6TeDA	.S	127	v0 - 1v0		B8600v8	10-Jun-18	1401 g	1%Jun-18 0R:%d	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The re, ult, are reported in drKweight4
The , ample , ize i, reported in wet weight4
y e, ult, reported to the DL4
When reportedI P6HxSI P6OA and P6OS include both linear and branched i, omer, 4
OnlKthe linear i, omer i, reported for all other analKte, 4

Sample ID: SKIDU20200180427N **VAL - PFAS**

Client Data

Name: Merit Laboratorie, I .nc4
Project: Lapeer Sampling
Location: 08n11eKK-SF 01

Matrix: Soil
Date Collected: u7-Apr-18 1R:1%

Laboratory Data

Lab Sample: 1800899-0%
Date v eceiyed: 0R-Ma3-18 09:R8
s Solid, :

ColBmn: EH2 C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
P6EA	K7%uu-R	ND	04luR	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6PeA	u705-90-K	ND	04179	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6ES	K7%7K-%	ND	04Ku1	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P62 xA	K07-uR-R	ND	04180	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P62 pA	K7%8%9	ND	04181	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P62 xS	K%%R5-R	ND	04u7R	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
5:u 6TS	u7519-97-u	ND	04u0K	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6OA	KK%57-1	04u89	04u09	04888%	1477	J	E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P62 pS	K7%9u-8	ND	041%1	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6OS	175K-uK-1	74K8	047R8	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6NA	K7%9%1	ND	041%8	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6DA	KK%75-u	04uR7	04uu7	04888%	1477	J	E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
8:u 6TS	K9108-KR-R	ND	04u%u	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6OSA	7%R-91-5	ND	04u01	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
Me6OSAA	uK%%K1-9	ND	04u57	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6DS	KK%77-K	145R	04178	04888%	1477	J	E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6UnA	u0%8-9R-8	ND	04K1K	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
Ht6OSAA	u991-%0-5	ND	04u8R	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6DoA	K07-%%1	ND	04uRR	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6TrDA	7u5u9-9R-8	ND	04108	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6TeDA	K75-05-7	ND	0417%	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6NS	58u%9-1u-1	ND	14u7	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
P6PeS	u705-91-R	ND	047R8	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
R:u 6TS	7%71uR-7u-R	ND	047R8	04888%	1477		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
1KCK-P6EA	.S	894	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
1KCK-P6PeA	.S	100	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
1KCK-P6ES	.S	984	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
1KCu-P62 xA	.S	984u	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
1KCR-P62 pA	.S	914	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
18Ou-P62 xS	.S	7u4K	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
1KCu-P6OA	.S	914u	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
1KC8-P6OS	.S	8%4K	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
1KC%P6NA	.S	814	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
1KCu-P6DA	.S	7%4R	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
1KC8-P6OSA	.S	5R41	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
dK-Me6OSAA	.S	7%4%	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
1KCu-P6UnA	.S	914K	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1

Sample ID: SKIDU20200180427N **VAL - PFAS**

Client Data

Name: Merit Laboratorie, I .nc4
Project: Lapeer Sampling
Location: 08n11eKK-SF 01

Matrix: Soil
Date Collected: u7-Apr-18 1R:1%

Laboratory Data

Lab Sample: 1800899-0%
Date v eceiyed: 0R-Ma3-18 09:R8
s Solid, :

ColBmn: EH2 C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d%Ht6OSAA	.S	7u48	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
1KCu-P6DoA	.S	8549	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1
1KCu-P6TeDA	.S	1R0	%0 - 1%0		E8600%8	10-JBn-18	141%g	1R-JBn-18 0K:%u	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of qBantitation

LCL-UCL- Lower control limit - Bpper control limit
The re, Blt, are reported in dr3 weight4
The , ample , ize i, reported in wet weight4
v e, Blt, reported to the DL4

When reportedI P62 xSI P6OA and P6OS inclBde both linear and branched i, omer, 4
Onl3 the linear i, omer i, reported for all other anal3te, 4

Sample ID: SKIDU30100840237N **VAL - PFAS**

Client Data

Name: Merit Laboratorie, I .nc4
Project: Lapeer Sampling
Location: 08n11evv-S6 01

Matrix: Soil
Date Collected: 7A-Rpr-18 1u:v0

Laboratory Data

Lab Sample: 1800899-0%
Date y ecei3ed: 0K-MaF-18 09:K8
s Solid, :

ColBmn: EH2 C18

994u

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PJ ER	vAu-77-K	ND	04lK1	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ PeR	7A0%90-v	ND	0470v	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ ES	vAu-Av-u	ND	04v%u	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ 2 xR	v0A-7K-K	ND	0470K	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ 2 pR	vAu-8u-9	ND	0470%	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ 2 xS	vuu-K%K	ND	04v17	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
%7 J TS	7A%d9-9A-7	14Ku	047v0	1401	7401	5	E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ OR	vvu-%A-1	ND	047vA	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ 2 pS	vAu-97-8	ND	04lA1	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ OS	1A%v-7v-1	%4uu	048K9	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ NR	vAu-9u-1	ND	04lA9	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ DR	vvu-A%7	047%7	047uA	1401	7401	5	E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
8:7 J TS	v9108-vK-K	ND	0478%	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ OSR	AuK-91-%	ND	04778	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
MeJ OSR R	7vuu-v1-9	ND	04v0K	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ DS	vvu-AA-v	147u	04707	1401	7401	5	E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ UnR	70u8-9K-8	ND	04vu%	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
HtJ OSR R	7991-u0-%	ND	04v7v	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ DoR	v0A-uu-1	ND	047AA	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ TrDR	A7%79-9K-8	ND	04l7v	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ TeDR	vA%0%A	ND	04l99	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ NS	%87u9-17-1	ND	14KK	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
PJ PeS	7A0%91-K	ND	048K9	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
K:7 J TS	AuAl 7K-A7-K	ND	048K9	1401	7401		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
1vCv-PJ ER	.S	914A	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
1vCv-PJ PeR	.S	994	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
1vCv-PJ ES	.S	9K4l	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
1vC7-PJ 2 xR	.S	974K	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
1vCK-PJ 2 pR	.S	8A40	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
18O7-PJ 2 xS	.S	894v	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
1vC7-PJ OR	.S	9v4%	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
1vC8-PJ OS	.S	8K4%	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
1vCu-PJ NR	.S	8%49	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
1vC7-PJ DR	.S	A94A	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
1vC8-PJ OSR	.S	%v4l	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
dv-MeJ OSR R	.S	u%8	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
1vC7-PJ UnR	.S	8u40	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1

Sample ID: SKIDU30100840237N **VAL - PFAS**

Client Data

Name: Merit Laboratorie, I .nc4
Project: Lapeer Sampling
Location: 08n11evv-S6 01

Matrix: Soil
Date Collected: 7A-Rpr-18 1u:v0

Laboratory Data

Lab Sample: 1800899-0%
Date y ecei3ed: 0K-MaF-18 09:K8
s Solid, :

ColBmn: EH2 C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
du-HtJ OSRR	.S	Au49	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
1vC7-PJ DoR	.S	9%40	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1
1vC7-PJ TeDR	.S	1v7	u0 - 1u0		E8J 00u8	10-5Bn-18	1400 g	1K-5Bn-18 0K:07	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of qBantitation
LCL-UCL- Lower control limit - Bpper control limit
The re, Blt, are reported in drF weight4
The , ample , ize i, reported in wet weight4
y e, Blt, reported to the DL4
When reportedI PJ 2 xSI PJ OR and PJ OS inclBde both linear and branched i, omer, 4
OnlF the linear i, omer i, reported for all other analFte, 4

Sample ID: SKIDU20200210847N **VAL - PFAS**

Client Data

Name: Merit Laboratorie, I .nc4
Project: Lapeer Sampling
Location: 08n11eKK-SF 01

Matrix: Soil
Date Collected: 2%7 pr-18 1%0A

Laboratory Data

Lab Sample: 1800899-0%
Date Received: 0y-Ma3-18 09:y8
s Solid, :

Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
P6B7	K%A-22-y	ND	041 28	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6Pe7	2%05-90-K	ND	041 8A	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6BS	K%A-%K-A	ND	04KKK	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6Hx7	K0%2y-y	ND	041 85	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6Hp7	K%A-8A-9	ND	041 88	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6HxS	KAA-y5-y	ND	042 8A	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
5:2 6TS	2%519-9%2	245%	042 10	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6O7	KKA-5%1	ND	042 1%	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6HpS	K%A-92-8	ND	041 A5	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6OS	1%5K-2K-1	114K	04%5	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6N7	K%A-9A-1	ND	041 5K	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6D7	KKA-%5-2	ND	042 KA	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
8:2 6TS	K9108-Ky-y	ND	042 52	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6OS7	%4y-91-5	ND	042 08	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
Me6OS7 7	2KAA-K1-9	ND	042 %%	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6DS	KKA-%%K	ND	041 8y	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6Un7	20A8-9y-8	ND	04K2A	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
Et6OS7 7	2991-A0-5	ND	042 9A	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6Do7	K0%AA-1	ND	042 AK	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6TrD7	%2529-9y-8	ND	041 12	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6TeD7	K%5-05-%	ND	041 82	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6NS	582A9-12-1	ND	14K1	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
P6PeS	2%05-91-y	ND	04%5	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
y:2 6TS	%A%12y-%2-y	ND	04%5	04918	148y		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
1KCK-P6B7	.S	894 0	A0 - 1A0		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
1KCK-P6Pe7	.S	924 2	A0 - 1A0		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
1KCK-P6BS	.S	8A4 2	A0 - 1A0		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
1KC2-P6Hx7	.S	9K4K	A0 - 1A0		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
1KCy-P6Hp7	.S	8y4 0	A0 - 1A0		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
18O2-P6HxS	.S	854 2	A0 - 1A0		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
1KC2-P6O7	.S	%94y	A0 - 1A0		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
1KC8-P6OS	.S	824 5	A0 - 1A0		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
1KCA-P6N7	.S	814 5	A0 - 1A0		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
1KC2-P6D7	.S	%A4 1	A0 - 1A0		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
1KC8-P6OS7	.S	524 8	A0 - 1A0		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
dK-Me6OS7 7	.S	514y	A0 - 1A0		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1
1KC2-P6Un7	.S	8K49	A0 - 1A0		B8600A8	10-Jun-18	1410 g	1y-Jun-18 0y:1K	1

Sample ID: SKIDU20200210847N **VAL - PFAS**

Client Data

Name: Merit Laboratorie, I .nc4
Project: Lapeer Sampling
Location: 08n11eKK-SF 01

Matrix: Soil
Date Collected: 2%7 pr-18 1%0A

Laboratory Data

Lab Sample: 1800899-0%
Date Received: 0y-Ma3-18 09:y8
s Solid, :

Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
dA-Et6OS7 7	.S	5%4%	A0 - 1A0		B8600A8	10-Jun-18	14l0 g	1y-Jun-18 0y:1K	1
1KC2-P6Do7	.S	924 2	A0 - 1A0		B8600A8	10-Jun-18	14l0 g	1y-Jun-18 0y:1K	1
1KC2-P6TeD7	.S	12A	A0 - 1A0		B8600A8	10-Jun-18	14l0 g	1y-Jun-18 0y:1K	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The re, ult, are reported in dr3 weight4
The , ample , ize i, reported in wet weight4
Re, ult, reported to the DL4
When reportedI P6HxSI P6O7 and P6OS include both linear and branched i, omer, 4
Onl3 the linear i, omer i, reported for all other anal3te, 4

Sample ID: SKIDU20100280417N **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11eAA-SF 01

Matrix: Soil
Date Collected: H2-7 pr-18 12:AR

Laboratory Data

Lab Sample: 1800899-08
Date v eceiyed: 03-MaK-18 09:38
% Solids: 98.8

Col4mn: u BE C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
P6u 7	A2R-HH-3	ND	0.1A3	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6Pe7	H205-90-A	ND	0.19A	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6u S	A2R-2A-R	ND	0.A32	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6E x7	A02-HB-3	ND	0.193	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6E p7	A2R-8R-9	ND	0.195	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6E xS	ARR-35-3	ND	0.H95	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
5:H6TS	H2519-92-H	1.00	0.H19	0.9RR	1.91	J	u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6O7	AAR-52-1	ND	0.HHR	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6E pS	A2R-9H-8	ND	0.15H	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6OS	125A-HA-1	1HR	0.802	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6N7	A2R-9R-1	ND	0.120	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6D7	AAR-25-H	0.H21	0.HBR	0.9RR	1.91	J	u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
8:H6TS	A9108-A3-3	ND	0.H2H	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6OS7	2R3-91-5	ND	0.HI2	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
Me6OS7 7	HARR-A1-9	ND	0.HB9	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6DS	AAR-22-A	0.HAR	0.19H	0.9RR	1.91	J	u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6Un7	H0R8-93-8	ND	0.AA8	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
Bt6OS7 7	H991-R0-5	ND	0.A02	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6Do7	A02-RR-1	ND	0.H53	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6TrD7	2H5H9-93-8	ND	0.112	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6TeD7	A25-05-2	ND	0.189	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6NS	58HR9-1H-1	ND	1.A2	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
P6PeS	H205-91-3	ND	0.802	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
3:H6TS	2R21HB-2H-3	ND	0.802	0.9RR	1.91		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
1ACA-P6u 7	IS	89.H	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
1ACA-P6Pe7	IS	93.R	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
1ACA-P6u S	IS	9AH	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
1ACH-P6E x7	IS	9H3	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
1AC3-P6E p7	IS	83.A	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
18OH-P6E xS	IS	92.8	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
1ACH-P6O7	IS	95.H	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
1AC8-P6OS	IS	83.3	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
1ACR-P6N7	IS	91.A	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
1ACH-P6D7	IS	8A0	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
1AC8-P6OS7	IS	51.H	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
dA-Me6OS7 7	IS	5HH	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
1ACH-P6Un7	IS	90.1	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1

Sample ID: SKIDU20100280417N **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11eAA-SF 01

Matrix: Soil
Date Collected: H2-7 pr-18 12:AR

Laboratory Data

Lab Sample: 1800899-08
Date v eceiyed: 03-MaK-18 09:38
% Solids: 98.8

Col4mn: u BE C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
dR-Bt6OS7 7	IS	R5.5	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
1ACH-P6Do7	IS	8HA	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1
1ACH-P6TeD7	IS	1HH	R0 - 1R0		u 8600R8	10-J4n-18	1.05 g	13-J4n-18 03:HA	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of q4antitation
LCL-UCL- Lower control limit - 4pper control limit
The res4lts are reported in drKweight.
The sample size is reported in wet weight.
v es4lts reported to the DL.
When reported, P6ExS, P6O7 and P6OS incl4de both linear and branched isomers.
OnlKthe linear isomer is reported for all other analKtes.

Sample ID: SKIDU30100380427N **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e33-SK01

Matrix: Soil
Date Collected: 24-7 pr-18 18:10

Laboratory Data

Lab Sample: 1800899-09
Date AeceiRed: 0v-May-18 09:v8
% Solids: 98.4

Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFB7	34J-22-v	ND	0.1v2	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFPe7	2405-90-3	ND	0.20J	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFBS	34J-43-J	ND	0.358	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFHx7	304-2v-v	ND	0.205	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFHp7	34J-8J-9	ND	0.208	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFHxS	3JJ-v5-v	ND	0.31v	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
5:2 FTS	24519-94-2	1.59	0.232	1.01	2.03	6	B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFO7	33J-54-1	ND	0.239	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFHpS	34J-92-8	ND	0.142	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFOS	1453-23-1	11.v	0.8J5	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFN7	34J-9J-1	ND	0.180	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFD7	33J-45-2	ND	0.2J9	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
8:2 FTS	39108-3v-v	ND	0.289	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFOS7	4Jv-91-5	ND	0.230	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
MeFOS7 7	23JJ-31-9	ND	0.305	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFDS	33J-44-3	0.v82	0.20v	1.01	2.03	6	B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFUn7	20J8-9v-8	ND	0.3J9	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
EtFOS7 7	2991-J0-5	ND	0.32J	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFDo7	304-JJ-1	ND	0.280	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFTrD7	42529-9v-8	ND	0.12v	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFTeD7	345-05-4	ND	0.201	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFNS	582J9-12-1	ND	1.vJ	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
PFPeS	2405-91-v	ND	0.8J5	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
v:2 FTS	4J412v-42-v	ND	0.8J5	1.01	2.03		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFB7	IS	92.2	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
13C3-PFPe7	IS	94.9	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
13C3-PFBS	IS	9J.2	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
13C2-PFHx7	IS	91.1	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
13Cv-PFHp7	IS	8J.1	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
18O2-PFHxS	IS	94.2	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
13C2-PFO7	IS	89.1	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
13C8-PFOS	IS	8J.0	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
13CJ-PFN7	IS	92.5	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
13C2-PFD7	IS	8J.8	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
13C8-PFOS7	IS	59.2	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
d3-MeFOS7 7	IS	58.J	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
13C2-PFUn7	IS	91.5	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1

Sample ID: SKIDU30100380427N **VAL - PFAS**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Lapeer Sampling	Date Collected:	24-7 pr-18 18:10
Location:	08n11e33-SK01		

Laboratory Data

Lab Sample:	1800899-09	Column:	BEH C18
Date AeceiRed:	0v-May-18 09:v8		
% Solids:	98.4		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
dJ-EtFOS7 7	IS	40.4	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
13C2-PFDo7	IS	100	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1
13C2-PFTeD7	IS	133	J0 - 1J0		B8F00J8	10-6un-18	1.00 g	1v-6un-18 0v:33	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Aesults reported to the DL.
When reported, PFHxS, PFO7 and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	**This compound was also detected in the method blank**
Conc.	**Concentration**
D	**Dilution**
DL	**Detection limit**
E	**The associated compound concentration exceeded the calibration range of the instrument**
H	**Recovery and/or RPD was outside laboratory acceptance limits**
I	**Chemical Interference**
J	**The amount detected is below the Reporting Limit/LOQ**
LOD	**Limits of Detection**
LOQ	**Limits of Quantitation**
M	**Estimated Maximum Possible Concentration (CA Region 2 projects only)**
NA	**Not applicable**
ND	**Not Detected**
Q	**Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)**
TEQ	**Toxic Equivalency**
U	**Not Detected (specific projects only)**
*****	**See Cover Letter**

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

CERTIFICATIONS

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	17-015-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-18
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2016026
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207717
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-008
Pennsylvania Department of Environmental Protection	014
Texas Commission on Environmental Quality	T104704189-17-8
Virginia Department of General Services	9077
Washington Department of Ecology	C584
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.

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800899 Temp: 2.2 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: **Lapeer PFAS Biosolids Investigation** PO#: **60570635** Sampler: **Stan Krenz** (name)

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

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

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Dorin Bogdan	5/16/2018	17:30			
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

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

ATTN: Jennifer Miller

Method of Shipment: ~~FED EX~~

Tracking No.:

Add Analysis(es) Requested

Container(s) | PFAS Isotope Dilution | USEPA Method 537

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	PFOA/ PFOS	UCMR3 PFAS List 6	PFAS List: 14	Comments
SK1DU30300180427N	4/27/18	1100	08n11e33-SK01	3	P	SO			X							ISM
SK1DU30200180427N	4/27/18	1200	08n11e33-SK01	3	P	SO			X							ISM
SK1DU30100180427N	4/27/18	1300	08n11e33-SK01	3	P	SO			X							ISM
SK1DU20100180427N	4/27/18	1345	08n11e33-SK01	3	P	SO			X							ISM
SK1DU20200180427N	4/27/18	1415	08n11e33-SK01	3	P	SO			X							ISM
SK1DU20300180427N	4/27/18	1530	08n11e33-SK01	3	P	SO			X							ISM
SK1DU10100180427N	4/27/18	1705	08n11e33-SK01	3	P	SO			X							ISM
SK1DU10200180427N	4/27/18	1735	08n11e33-SK01	3	P	SO			X							ISM
SK1DU10300180427N	4/27/18	1810	08n11e33-SK01	3	P	SO			X							ISM

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street**
City: **Lansing** State: **MI** Zip: **48909**
Phone: **517-897-1597** Fax: **517-241-3571**
Email: dorin.bogdan@aecom.com

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

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

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

Revised COC - received from Dorin Bogdan 5/17/18 JW

CHAIN OF CUSTODY

Vista Analytical Laboratory

For Laboratory Use Only
Work Order #: 1800899 Temp: 2.2 °C KE 05/08/18
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: **LAPEER SAMPLING** PO#: **60570309** Sampler: **John Yanchula** (name)

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

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

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
John Yanchula John Yanchula	5/3/18	1830	FED EX		
FED EX →			Kim Ehlic	05/04/18	1014

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

ATTN: Jennifer Miller

Method of Shipment: FED EX

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	PFAS Isotope Dilution: List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	USEPA Method 537: PFOA/ PFOS	UCMR3 PFAS List-6	PFAS List-14	Comments
SKIDU3Φ3ΦΦ18Φ427N	4/27/18	1100	LAPEER	3		S			x							
SKIDU3Φ2ΦΦ18Φ427N	4/27/18	1200	LAPEER	3		S			x							
SKIDU3Φ1ΦΦ18Φ427N	4/27/18	1300	LAPEER	3		S			x							
SKIDU2Φ1ΦΦ18Φ427N	4/27/18	1345	LAPEER	3		S			x							
SKIDU2Φ2ΦΦ18Φ427N	4/27/18	1415	LAPEER	3		S			x							
SKIDU2Φ3ΦΦ18Φ427N	4/27/18	1530	LAPEER	3		S			x							
SKIDU1Φ1ΦΦ18Φ427N	4/27/18	1705	LAPEER	3		S			x							
SKIDU1Φ1ΦΦ18Φ427N	4/27/18	1735	LAPEER	3		S			x							
SKIDU1Φ1ΦΦ18Φ427N	4/27/18	1810	LAPEER	3		S			x							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:
Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Stree**
City: **Lansing** State: **MI** Zip: **48909**
Phone: **517-897-1597** Fax: **517-241-3571**
Email: **dorin.bogdan@aecom.com**

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

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

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

Vista Analytical Laboratory

Sample Log-in Checklist

Vista Work Order #: 1800899 **TAT** Std.

Samples Arrival:	**Date/Time** 05/04/18 0948	**Initials:** KG	**Location:** WR-2 **Shelf/Rack:** N/A
Logged In:	**Date/Time** 05/08/18 0920	**Initials:** (JW)	**Location:** WR2 **Shelf/Rack:** A-5

Delivered By:	(FedEx)	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	(Ice)		Blue Ice		Dry Ice		None

Temp °C: 2.3	(uncorrected)	**Time:** 1033	**Thermometer ID:** IR-4
Temp °C: 2.2	(corrected)	**Probe used:** Yes☐ No☑	

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?			✓
Shipping Documentation Present?	✓		
Airbill 3 of 3 Trk # 7808 1407 5850	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?		✓	
COC Anomaly/Sample Acceptance Form completed?	✓		

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

Comments:

SKIDW30100180427N
SKIDW30200180427N
SKIDW30300180427N
SKIDW20100180427N
SKIDW20300180427N
SKIDW20200180427N

SKIDW10100180427N
• SKIDW10200180427N
• SKIDW10300180427N

* COC different from Sample

Chain of Custody Anomaly/Sample Acceptance Form

Vista Analytical Laboratory

Merit Laboratories, Inc.
Maya Murshak
mayamurshak@meritlabs.com
(517) 827-2744

Workorder Number: 1800899
Date Received: 04-May-18 09:48
Documented by/date: Kim Elric 05/08/18

Please review the following information and complete the Client Authorization section. To comply with NELAC regulations, we must receive authorization before proceeding with sample analysis.

Thank you,

Martha Maier
mmaier@vista-analytical.com
916-673-1520

[X] Sample IDs on Chain of Custody do not match Sample Container Labels

Chain of Custody ID	Container Label ID
SKIDU30300180427N	SKIDU30300180427N
SKIDU30200180427N	SKIDU30200180427N
SKIDU30100180427N	SKIDU30100180427N
SKIDU20100180427N	SKIDU20100180427N
SKIDU20200180427N	SKIDU20200180427N
SKIDU20300180427N	SKIDU20300180427N
SKIDU10100180427N	SKIDU10100180427N
*SKIDU10100180427N	SKIDU10200180427N
*SKIDU10100180427N	SKIDU10300180427N

Client Authorization

Proceed with Analysis: (YES) NO Signature and Date [signature] 5/16/18

Client Comments/Instructions Per Dorin Bogdan use container label ID for samples.

June 15, 2018

Vista Work Order No. 1800936

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 May 12, 2018. This sample set was analyzed on a standard turn-around time, under your Project Name 'Lapeer'.

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

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

Sincerely,

Martha Maier
Laboratory Director

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

Vista Work Order No. 1800936
Case Narrative

Sample Condition on Receipt:

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

Analytical Notes:

PFAS Isotope Dilution Method

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

Laboratory ID	Sample Name
1800936-02	SK1SW0100180509N
1800936-04	SK1DR0200180509N
1800936-05	SK1DR0100180509N
1800936-06	SK1SW0300180509N
1800936-07	SK1DR0400180509N
1800936-08	SK1DR0500180509N

The samples were extracted and analyzed for a selected list of PFAS using the PFAS Isotope Dilution Method (Modified EPA Method 537).

Holding Times

The samples were extracted and analyzed within the method hold times. The samples were re-extracted for 6:2 FTS; the re-extractions 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. A concentration of 4.47 ng/L of 6:2 FTS was detected in the original Method Blank. Results for this analyte were reported from re-extractions of all the samples except "SK1DR0400180509N". No other analytes were detected in the Method Blanks above 1/2 the LOQ. The recoveries of all reported analytes in the OPRs were within the method acceptance criteria.

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

QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
B8E0146-BLK1	B8E0146-BLK1	PFAS Isotope Dilution Method	13C8-PFOSA	H	49.1
B8E0146-BS1	B8E0146-BS1	PFAS Isotope Dilution Method	13C8-PFOSA	H	41.7
B8F0041-BLK1	B8F0041-BLK1	PFAS Isotope Dilution Method	13C8-PFOSA	H	41.3
B8F0041-BS1	B8F0041-BS1	PFAS Isotope Dilution Method	13C8-PFOSA	H	34.9
B8F0066-BLK1	B8F0066-BLK1	PFAS Isotope Dilution Method	13C8-PFOSA	H	36.0
B8F0066-BS1	B8F0066-BS1	PFAS Isotope Dilution Method	13C8-PFOSA	H	42.6

H = Recovery was outside laboratory acceptance criteria.

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800936-01	SK1SW0200180509N	09-May-18 15:05	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800936-02	SK1SW0100180509N	09-May-18 15:45	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800936-03	SK1DR0300180509N	09-May-18 16:15	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800936-04	SK1DR0200180509N	09-May-18 16:30	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800936-05	SK1DR0100180509N	09-May-18 17:05	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800936-06	SK1SW0300180509N	09-May-18 17:15	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800936-07	SK1DR0400180509N	09-May-18 17:20	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800936-08	SK1DR0500180509N	09-May-18 17:30	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0146-BLK1
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.365	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFPeA	2706-90-3	ND	0.640	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFBS	375-73-5	ND	0.895	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
4:2 FTS	757124-72-4	ND	1.37	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFHxA	307-24-4	ND	1.09	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFPeS	2706-91-4	ND	1.37	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFHpA	375-85-9	ND	0.296	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFHxS	355-46-4	ND	0.474	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
6:2 FTS	27619-97-2	4.47	1.00	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFOA	335-67-1	ND	0.326	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFHpS	375-92-8	ND	0.469	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFNA	375-95-1	ND	0.405	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFOSA	754-91-6	ND	0.885	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFOS	1763-23-1	ND	0.404	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFDA	335-76-2	ND	0.745	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
8:2 FTS	39108-34-4	ND	1.03	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFNS	68259-12-1	ND	1.94	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
MeFOSAA	2355-31-9	ND	0.825	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
EtFOSAA	2991-50-6	ND	0.685	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFUnA	2058-94-8	ND	0.525	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFDS	335-77-3	ND	0.615	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFDoA	307-55-1	ND	0.396	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFTrDA	72629-94-8	ND	0.247	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFTeDA	376-06-7	ND	0.378	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.4	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C3-PFPeA	IS	95.8	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C3-PFBS	IS	108	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C2-PFHxA	IS	97.4	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C4-PFHpA	IS	99.1	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
18O2-PFHxS	IS	98.0	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C2-PFOA	IS	84.8	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C5-PFNA	IS	84.9	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C8-PFOSA	IS	49.1	50 - 150	H	B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C8-PFOS	IS	99.1	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C2-PFDA	IS	72.3	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
d3-MeFOSAA	IS	66.2	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
d5-EtFOSAA	IS	70.1	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0146-BLK1
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	58.8	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C2-PFDoA	IS	77.3	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C2-PFTeDA	IS	64.8	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: OPR

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0146-BS1
Column: BEH C18

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	38.1	40.0	95.3	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFPeA	2706-90-3	38.5	40.0	96.3	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFBS	375-73-5	37.6	40.0	94.0	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
4:2 FTS	757124-72-4	36.3	40.0	90.7	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFHxA	307-24-4	39.0	40.0	97.6	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFPeS	2706-91-4	37.7	40.0	94.3	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFHpA	375-85-9	42.1	40.0	105	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFHxS	355-46-4	38.4	40.0	96.0	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
6:2 FTS	27619-97-2	37.8	40.0	94.4	60 - 130	B	B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFOA	335-67-1	36.8	40.0	92.0	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFHpS	375-92-8	44.1	40.0	110	60 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFNA	375-95-1	38.6	40.0	96.4	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFOSA	754-91-6	36.8	40.0	92.1	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFOS	1763-23-1	38.1	40.0	95.2	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFDA	335-76-2	38.0	40.0	95.1	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
8:2 FTS	39108-34-4	32.7	40.0	81.7	60 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFNS	68259-12-1	41.2	40.0	103	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
MeFOSAA	2355-31-9	35.6	40.0	88.9	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
EtFOSAA	2991-50-6	40.4	40.0	101	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFUnA	2058-94-8	36.4	40.0	91.1	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFDS	335-77-3	48.6	40.0	122	60 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFDoA	307-55-1	42.0	40.0	105	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFTrDA	72629-94-8	46.0	40.0	115	60 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFTeDA	376-06-7	47.4	40.0	118	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.9	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C3-PFPeA	IS	95.4	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C3-PFBS	IS	116	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C2-PFHxA	IS	99.9	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C4-PFHpA	IS	89.2	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
18O2-PFHxS	IS	99.6	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C2-PFOA	IS	85.1	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C5-PFNA	IS	93.1	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C8-PFOSA	IS	41.7	50- 150	H	B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C8-PFOS	IS	104	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1

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

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0146-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	87.1	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
d3-MeFOSAA	IS	81.6	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
d5-EtFOSAA	IS	78.2	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C2-PFUnA	IS	68.3	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C2-PFDoA	IS	81.5	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C2-PFTeDA	IS	69.7	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1

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

Client Data
Name: Merit LaboratorieKs, I cn
Project: Lapeer
Matrix: AqCeoCK

Laboratory Data
Lab Sample: B8E00146BL- 4
. olCmI : BuH . 48

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PEBA	Fy5622 6l	ND	0nF35	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PEPeA	2y036706F	ND	0n310	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PEBS	Fy56yF65	ND	0n875	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
1:2 E9S	y5y4216y26l	ND	4nFy	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PEHxA	F0y62 16l	ND	4n07	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PEPeS	2y036746l	ND	4nFy	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PEHpA	Fy568567	ND	0n273	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PEHxS	F556l 36l	ND	0nly1	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
3:2 E9S	2y34767y62	ND	4n00	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PETA	FF563y64	ND	0nF23	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PEHpS	Fy567268	ND	0nl37	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PENA	Fy567564	ND	0nl05	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PETSA	y5167463	ND	0n885	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PETS	4y3F62F64	ND	0nl01	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PEDA	FF56y362	ND	0ny15	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
8:2 E9S	F74086F16l	ND	4n0F	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PENS	3825764264	ND	4n71	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
MeETSAA	2F556F467	ND	0n825	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
utETSAA	277465063	ND	0n385	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PEOIA	205867168	ND	0n625	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PEDS	FF56yy6F	ND	0n345	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PEDoA	F0y65564	ND	0nF73	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PE9rDA	y232767168	ND	0n21y	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
PE9eDA	Fy36036y	ND	0nFy8	2n50	1n00		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
4F. F6PEBA	,S	78n5	50 6 450		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
4F. F6PEPeA	,S	73n8	50 6 450		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
4F. F6PEBS	,S	445	50 6 450		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
4F. 26PEHxA	,S	73n5	50 6 450		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
4F. 16PEHpA	,S	77nF	50 6 450		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
48T 26PEHxS	,S	404	50 6 450		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
4F. 26PETA	,S	88nl	50 6 450		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
4F. 56PENA	,S	7FnF	50 6 450		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
4F. 86PETSA	,S	14nF	50 6 450	H	B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
4F. 86PETS	,S	88n3	50 6 450		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
4F. 26PEDA	,S	85n3	50 6 450		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
UF6MeETSAA	,S	33n2	50 6 450		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4
U56utETSAA	,S	73nl	50 6 450		B8E0014	086JCI 648	0n250 L	406JCI 648 08:14	4

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

Client Data

Name: Merit LaboratorieKs, I cn
Project: Lapeer
Matrix: AqCeoCK

Laboratory Data

Lab Sample: B8E00146BL- 4 . olCmI : BuH . 48

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
4F. 26PEOI A	,S	80nF	50 6 450		B8E0014	086JCI648	0n250 L	406JCI648 08:14	4
4F. 26PEDoA	,S	85n0	50 6 450		B8E0014	086JCI648	0n250 L	406JCI648 08:14	4
4F. 26PE9eDA	,S	87ny	50 6 450		B8E0014	086JCI648	0n250 L	406JCI648 08:14	4

DL 6DetectioI Limit
LTD 6Limit of DetectioI
LTQ 6Limit of qCaI titatioI
L. L6O. L6Lod er coI trol limit 6Cpper coI trol limit
weKCltKreporteUto tRe DLn
h ReI reporteUsPEHxSs PETA aI UPETS iI clCUe botR IiI ear aI UbraI cReUiKomerKn
T I1WtRe IiI ear iKomer iKreporteUfor all otRer aI alWeKn

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

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous
Project: Lapeer

Laboratory Data

Lab Sample: B8F0041-BS1 Column: BEH C18

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	39.0	40.0	97.5	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFPeA	2706-90-3	38.3	40.0	95.6	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFBS	375-73-5	38.7	40.0	96.7	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
4:2 FTS	757124-72-4	37.7	40.0	94.3	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFHxA	307-24-4	38.2	40.0	95.5	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFPeS	2706-91-4	38.2	40.0	95.4	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFHpA	375-85-9	36.9	40.0	92.3	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFHxS	355-46-4	32.6	40.0	81.6	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
6:2 FTS	27619-97-2	46.3	40.0	116	60 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFOA	335-67-1	43.5	40.0	109	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFHpS	375-92-8	40.8	40.0	102	60 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFNA	375-95-1	40.2	40.0	101	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFOSA	754-91-6	31.4	40.0	78.6	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFOS	1763-23-1	42.9	40.0	107	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFDA	335-76-2	35.0	40.0	87.5	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
8:2 FTS	39108-34-4	28.6	40.0	71.5	60 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFNS	68259-12-1	34.6	40.0	86.6	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
MeFOSAA	2355-31-9	47.9	40.0	120	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
EtFOSAA	2991-50-6	37.5	40.0	93.9	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFUnA	2058-94-8	36.8	40.0	92.1	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFDS	335-77-3	42.1	40.0	105	60 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFDoA	307-55-1	38.0	40.0	95.0	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFTrDA	72629-94-8	40.1	40.0	100	60 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFTeDA	376-06-7	42.0	40.0	105	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	98.3	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C3-PFPeA	IS	95.9	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C3-PFBS	IS	111	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C2-PFHxA	IS	92.3	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C4-PFHpA	IS	100	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
18O2-PFHxS	IS	98.8	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C2-PFOA	IS	96.2	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C5-PFNA	IS	85.8	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C8-PFOSA	IS	34.9	50- 150	H	B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C8-PFOS	IS	90.3	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1

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

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8F0041-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	90.0	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
d3-MeFOSAA	IS	78.8	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
d5-EtFOSAA	IS	104	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C2-PFUnA	IS	96.2	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C2-PFDoA	IS	80.2	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C2-PFTeDA	IS	83.9	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1

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

Client Data
Name: Merit LaboratorieKs, I cn
Project: Lapeer
Matrix: AqCeoCK

Laboratory Data
Lab Sample: B8E00114BL6 -
. olCmI : BuH . - 8

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PEBA	Fy34DD42	N5	0rF13	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PEPeA	Dy014704F	N5	0rl120	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PEBS	Fy34yF43	N5	0r873	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
2:DE9 S	y3y- D24yD42	N5	- rFy	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PEHxA	F0y4D242	N5	- r07	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PEPeS	Dy0147- 42	N5	- rFy	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PEHpA	Fy348347	N5	0rD71	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PEHxS	F3342142	N5	0r2y2	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
1:DE9 S	Dy1- 747y4D	N5	- r00	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PET A	FF341y4-	N5	0rFD1	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PEHpS	Fy347D48	N5	0r217	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PENA	Fy34734-	N5	0r203	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PET SA	y3247- 41	N5	0r883	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PET S	- y1F4DF4-	N5	0r202	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PE5 A	FF34y14D	N5	0ry23	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
8:DE9 S	F7- 084F242	N5	- r0F	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PENS	18D874- D4-	N5	- r72	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
MeET SAA	DF334F- 47	N5	0r8D3	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
utET SAA	D77- 43041	N5	0rl83	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PEOI A	D03847248	N5	0r3D3	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PE5 S	FF34yy4F	N5	0rl- 3	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PE5 oA	F0y4334-	N5	0rF71	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PE9r5 A	yDI D747248	N5	0rD2y	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
PE9e5 A	Fy14014y	N5	0rFy8	Dr30	2r00		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
- F. F4PEBA	,S	77rD	30 4 - 30		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
- F. F4PEPeA	,S	- 03	30 4 - 30		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
- F. F4PEBS	,S	77r8	30 4 - 30		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
- F. D4PEHxA	,S	- 07	30 4 - 30		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
- F. 24PEHpA	,S	7Fr8	30 4 - 30		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
- 8T D4PEHxS	,S	73r8	30 4 - 30		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
- F. D4PET A	,S	77rl	30 4 - 30		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
- F. 34PENA	,S	88rD	30 4 - 30		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
- F. 84PET SA	,S	F1r0	30 4 - 30	H	B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
- F. 84PET S	,S	81rl	30 4 - 30		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
- F. D4PE5 A	,S	y3r3	30 4 - 30		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
UF4MeET SAA	,S	3Frl	30 4 - 30		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-
U34utET SAA	,S	32r3	30 4 - 30		B8E0011	- D4JCI 4- 8	0rD30 L	- 24JCI 4- 8 0y:3D	-

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

Client Data

Name: Merit LaboratorieKs, I cn
Project: Lapeer
Matrix: AqCeoCK

Laboratory Data

Lab Sample: B8E00114BL6 - . olCmI : BuH . - 8

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
- F. D4PEOI A	,S	yDD	30 4 - 30		B8E0011	- D4JCI 4- 8	0nD30 L	- 24JCI 4- 8 0y:3D	-
- F. D4PE5 oA	,S	11n0	30 4 - 30		B8E0011	- D4JCI 4- 8	0nD30 L	- 24JCI 4- 8 0y:3D	-
- F. D4PE9e5 A	,S	- - 0	30 4 - 30		B8E0011	- D4JCI 4- 8	0nD30 L	- 24JCI 4- 8 0y:3D	-

5 L 45 etectioI Limit
LT5 4Limit of 5 etectioI
LTQ 4Limit of qCaI titatioI
L. L4O. L4Lod er coI trol limit 4Cpper coI trol limit
weKCltKreporteUto tRe 5 Ln
h ReI reporteUsPEHxSs PETA aI UPETS iI clCUe botR IiI ear aI UbraI cReUiKomerKn
T I1WtRe IiI ear iKomer iKreporteUfor all otRer aI alWeKn

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

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous
Project: Lapeer

Laboratory Data

Lab Sample: B8F0044lBS- Column: BEH C-8

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	5J7122l3	3-.8	30.0	-07	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFPeA	2J0416015	56.6	30.0	66.8	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFBS	5J71J517	30.J	30.0	-02	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
3:2 FTS	J7J-23lJ213	37.7	30.0	--3	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFHxA	50J12313	58.3	30.0	67.6	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFPeS	2J0416-13	54.6	30.0	62.2	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFHpA	5J718716	32.4	30.0	-0J	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFHxS	57713413	74.6	30.0	-32	J0 1-50	H	B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
4:2 FTS	2J4-616J12	57.-	30.0	8J.J	40 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFOA	55714J1-	3-.0	30.0	-02	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFHpS	5J716218	58.-	30.0	67.5	40 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFNA	5J71671-	56.2	30.0	68.0	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFOSA	J7316-14	5J.6	30.0	63.8	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFOS	-J451251-	56.7	30.0	68.J	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFDA	5571J412	56.-	30.0	6J.J	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
8:2 FTS	56-08153l3	5J.J	30.0	63.2	40 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFNS	482761-21-	30.4	30.0	-02	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
MeFOSAA	257715-16	33.J	30.0	--2	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
EtFOSAA	266-17014	33.4	30.0	---	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFUnA	2078163l8	33.3	30.0	---	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFDS	5571JJ15	3-.J	30.0	-03	40 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFDoA	50J1771-	54.6	30.0	62.2	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFTrDA	J2426163l8	37.8	30.0	--7	40 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
PFTeDA	5J4104lJ	55.2	30.0	85.-	J0 1-50		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
-5C5lPFBA	IS	-00	701-70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
-5C5lPFPeA	IS	-03	701-70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
-5C5lPFBS	IS	6J.8	701-70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
-5C2lPFHxA	IS	-05	701-70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
-5C3lPFHpA	IS	62.8	701-70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
-8O2lPFHxS	IS	86.7	701-70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
-5C2lPFOA	IS	-06	701-70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
-5C7lPFNA	IS	68.4	701-70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
-5C8lPFOSA	IS	32.4	701-70	H	B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
-5C8lPFOS	IS	6-.4	701-70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-

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

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8F0044lBS-
Column: BEH C-8

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
-5C2lPFDA	IS	83.2	70l - 70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
d5lMeFOSAA	IS	70.8	70l - 70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
d7lEtFOSAA	IS	75.4	70l - 70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
-5C2lPFUnA	IS	J4.J	70l - 70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
-5C2lPFDoA	IS	J8.6	70l - 70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-
-5C2lPFTeDA	IS	--7	70l - 70		B8F0044	-219un1-8	0.270 L	-319un1-8 0J:32	-

Sample ID: SK1SW0200180509N — **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n11e33-SK01
Matrix: Aqueous
Date Collected: 09-May-18 15:05

Laboratory Data

Lab Sample: 1800936-01
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	6.02	0.356	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFPeA	2706-90-3	1.25	0.625	2.44	3.91	J	B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFBS	375-73-5	3.81	0.874	2.44	3.91	J	B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
4:2 FTS	757124-72-4	ND	1.34	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFHxA	307-24-4	1.79	1.06	2.44	3.91	J	B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFPeS	2706-91-4	ND	1.34	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFHpA	375-85-9	1.11	0.289	2.44	3.91	J	B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFHxS	355-46-4	1.26	0.462	2.44	3.91	J	B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
6:2 FTS	27619-97-2	ND	1.03	2.57	4.12		B8F0041	08-Jun-18	0.243 L	10-Jun-18 09:34	1
PFOA	335-67-1	0.790	0.318	2.44	3.91	J	B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFHpS	375-92-8	ND	0.458	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFNA	375-95-1	ND	0.396	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFOSA	754-91-6	ND	0.864	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFOS	1763-23-1	ND	0.394	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFDA	335-76-2	ND	0.728	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
8:2 FTS	39108-34-4	ND	1.01	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFNS	68259-12-1	ND	1.89	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
MeFOSAA	2355-31-9	ND	0.806	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
EtFOSAA	2991-50-6	ND	0.669	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFUnA	2058-94-8	ND	0.513	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFDS	335-77-3	ND	0.601	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFDoA	307-55-1	ND	0.387	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFTrDA	72629-94-8	ND	0.241	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
PFTeDA	376-06-7	ND	0.369	2.44	3.91		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.1	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
13C3-PFPeA	IS	94.1	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
13C3-PFBS	IS	110	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
13C2-PFHxA	IS	93.4	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
13C4-PFHpA	IS	94.5	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
18O2-PFHxS	IS	89.7	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
13C2-PFOA	IS	94.1	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
13C5-PFNA	IS	88.4	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
13C8-PFOSA	IS	58.0	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
13C8-PFOS	IS	106	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
13C2-PFDA	IS	95.8	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
d3-MeFOSAA	IS	85.1	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
d5-EtFOSAA	IS	97.9	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1

Sample ID: SK1SW0200180509N **PFAS Isotope Dilution Method**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Aqueous
Project:	Lapeer	Date Collected:	09-May-18 15:05
Location:	08n11e33-SK01		

Laboratory Data

Lab Sample:	1800936-01	Column:	BEH C18
Date Received:	12-May-18 09:57		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	73.1	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
13C2-PFDoA	IS	96.7	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1
13C2-PFTeDA	IS	72.8	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:15	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: SK1SW0100180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I n cu
Project: Lapeer
Locatio. : 08. 11e33-SF 01

Matrix: q yBeoB,
Date Collected: 09-Ma5-18 1R:vR

Laboratory Data

Lab Sample: 1800936-0s
Date 2 ecei7ed: 1s-Ma5-18 09:RK

ColBm. : EHA C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
P4Eq	3KR-ss-v	Rus6	0u3Rv	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4Peq	sK06-90-3	suv0	0u6s1	suvs	3u88	J	E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4ES	3KR-K3-R	su61	0u869	suvs	3u88	J	E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
v:s 4TS	KRK1sv-Ks-v	ND	1u33	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4Axq	30K-sv-v	ND	1u06	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4PeS	sK06-91-v	ND	1u33	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4Apq	3KR-8R-9	3u36	0us8K	suvs	3u88	J	E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4AxS	3RR-v6-v	1u68	0uv60	suvs	3u88	J	E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
6:s 4TS	sK619-9K-s	ND	0u98K	suvK	3u9R		E8400v1	08-JB. -18	0usR3 L	10-JB. -18 09:vv	1
P4Oq	33R-6K-1	Ku3v	0u316	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4ApS	3KR-9s-8	ND	0uvRR	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4Nq	3KR-9R-1	0u9s8	0u393	suvs	3u88	J	E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4OSq	KRv-91-6	ND	0u8R9	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4OS	1K63-s3-1	R1uv	0u39s	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4Dq	33R-K6-s	ND	0uKs3	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
8:s 4TS	39108-3v-v	ND	1u00	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4NS	68sR9-1s-1	ND	1u88	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
Me4OSq q	s3RR-31-9	ND	0u801	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
Ht4OSq q	s991-R0-6	ND	0u66R	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4U. q	s0R8-9v-8	ND	0uR10	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4DS	33R-KK-3	ND	0uR9K	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4Doq	30K-RR-1	ND	0u38v	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4TrDq	Ks6s9-9v-8	ND	0usv0	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
P4TeDq	3K6-06-K	ND	0u36K	suvs	3u88		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-P4Eq	nS	K8uK	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
13C3-P4Peq	nS	8KuR	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
13C3-P4ES	nS	91u0	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
13Cs-P4Axq	nS	90u8	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
13Cv-P4Apq	nS	86uK	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
18Os-P4AxS	nS	86u3	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
13Cs-P4Oq	nS	K9u9	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
13CR-P4Nq	nS	8vu6	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
13C8-P4OSq	nS	K6u6	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
13C8-P4OS	nS	8vu0	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
13Cs-P4Dq	nS	K3u8	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
d3-Me4OSq q	nS	83uR	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
dR-Ht4OSq q	nS	9Ru8	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1

Sample ID: SK1SW0100180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I n cu
Project: Lapeer
Locatio. : 08. 11e33-SF 01

Matrix: q yBeoB,
Date Collected: 09-Ma5-18 1R:vR

Laboratory Data

Lab Sample: 1800936-0s
Date 2 ecei7ed: 1s-Ma5-18 09:RK

ColBm. : EHA C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13Cs-P4U. q	nS	63uv	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
13Cs-P4Doq	nS	K8us	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1
13Cs-P4TeDq	nS	69u0	R0 - 1R0		E8H01v6	s3-Ma5-18	0usR8 L	03-JB. -18 0v:sR	1

DL - Detectio. Limit
LOD - Limit of Detectio.
LOQ - Limit of yBa. titatio.
LCL-UCL- Lower co. trol limit - Bpper co. trol limit
2 e, Blt, reported to the DLu
Whe. reportedI P4AxSI P4Oq a. d P4OS i. clBde both li. ear a. d bra. ched i, omer, u
O. l5 the li. ear i, omer i, reported for all other a. al5te, u

Sample ID: SK1DR0300180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n11e33-SK01
Matrix: Aqueous
Date Collected: 09-May-18 16:15

Laboratory Data

Lab Sample: 1800936-03
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	5.70	0.355	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFPeA	2706-90-3	3.55	0.624	2.44	3.90	J	B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFBS	375-73-5	13.8	0.873	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
4:2 FTS	757124-72-4	ND	1.34	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFHxA	307-24-4	6.19	1.06	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFPeS	2706-91-4	ND	1.34	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFHpA	375-85-9	6.16	0.288	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFHxS	355-46-4	5.29	0.462	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
6:2 FTS	27619-97-2	ND	1.03	2.56	4.10		B8F0066	12-Jun-18	0.244 L	14-Jun-18 08:03	1
PFOA	335-67-1	26.1	0.317	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFHpS	375-92-8	2.71	0.457	2.44	3.90	J	B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFNA	375-95-1	4.70	0.395	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFOSA	754-91-6	ND	0.863	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFOS	1763-23-1	2080	1.97	12.2	19.5	D	B8E0146	23-May-18	0.256 L	07-Jun-18 10:57	5
PFDA	335-76-2	5.55	0.726	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
8:2 FTS	39108-34-4	ND	1.00	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFNS	68259-12-1	2.08	1.89	2.44	3.90	J	B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
MeFOSAA	2355-31-9	ND	0.804	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
EtFOSAA	2991-50-6	ND	0.668	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFUnA	2058-94-8	0.614	0.512	2.44	3.90	J	B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFDS	335-77-3	ND	0.600	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFDoA	307-55-1	0.424	0.386	2.44	3.90	J	B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFTrDA	72629-94-8	ND	0.241	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
PFTeDA	376-06-7	ND	0.368	2.44	3.90		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	97.1	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
13C3-PFPeA	IS	95.1	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
13C3-PFBS	IS	110	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
13C2-PFHxA	IS	105	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
13C4-PFHpA	IS	101	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
18O2-PFHxS	IS	103	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
13C2-PFOA	IS	83.7	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
13C5-PFNA	IS	81.5	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
13C8-PFOSA	IS	80.4	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
13C8-PFOS	IS	111	50 - 150	D	B8E0146	23-May-18	0.256 L	07-Jun-18 10:57	5
13C2-PFDA	IS	106	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
d3-MeFOSAA	IS	104	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
d5-EtFOSAA	IS	103	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1

Sample ID: SK1DR0300180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n11e33-SK01
Matrix: Aqueous
Date Collected: 09-May-18 16:15

Laboratory Data

Lab Sample: 1800936-03
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	89.6	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
13C2-PFDoA	IS	87.4	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1
13C2-PFTeDA	IS	77.5	50 - 150		B8E0146	23-May-18	0.256 L	03-Jun-18 04:36	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: SK1DR0200180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I n cu
Project: Lapeer
Locatio. : 08. 11e33-SF 01

Matrix: q yBeoB,
Date Collected: 09-Ma5-18 16:30

Laboratory Data

Lab Sample: 1800936-0s
Date Received: 12-Ma5-18 09:7K

ColBm. : EHA C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
P4Eq	3K7-22-s	7u88	0u379	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4Peq	2K06-90-3	1u01	0u631	2us6	3u9s	J	E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4ES	3K7-K3-7	ND	0u883	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
s:2 4TS	K7K12s-K2-s	ND	1u37	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4Axq	30K-2s-s	ND	1u0K	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4PeS	2K06-91-s	ND	1u37	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4Apq	3K7-87-9	ND	0u291	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4AxS	377-s6-s	1u30	0us6K	2us6	3u9s	J	E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
6:2 4TS	2K619-9K-2	6u28	0u9K9	2us7	3u92		E8400s1	08-JB. -18	0u277 L	10-JB. -18 09:77	1
P4Oq	337-6K-1	1u07	0u321	2us6	3u9s	J	E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4ApS	3K7-92-8	ND	0us62	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4Nq	3K7-97-1	ND	0u399	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4OSq	K7s-91-6	ND	0u8K3	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4OS	1K63-23-1	2u9s	0u398	2us6	3u9s	J	E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4Dq	337-K6-2	ND	0uK37	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
8:2 4TS	39108-3s-s	ND	1u02	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4NS	68279-12-1	ND	1u91	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
Me4OSq q	2377-31-9	ND	0u81s	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
Ht4OSq q	2991-70-6	ND	0u6K7	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4U. q	2078-9s-8	ND	0u718	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4DS	337-KK-3	ND	0u606	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4Doq	30K-77-1	ND	0u391	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4TrDq	K2629-9s-8	ND	0u2ss	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
P4TeDq	3K6-06-K	ND	0u3K2	2us6	3u9s		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-P4Eq	nS	92u6	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
13C3-P4Peq	nS	93u6	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
13C3-P4ES	nS	102	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
13C2-P4Axq	nS	93u2	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
13Cs-P4Apq	nS	93u3	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
18O2-P4AxS	nS	91u6	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
13C2-P4Oq	nS	90ul	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
13C7-P4Nq	nS	92u0	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
13C8-P4OSq	nS	83u8	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
13C8-P4OS	nS	96ul	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
13C2-P4Dq	nS	97us	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
d3-Me4OSq q	nS	91u6	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
d7-Ht4OSq q	nS	90u7	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1

Sample ID: SK1DR0200180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I n cu
Project: Lapeer
Locatio. : 08. 11e33-SF 01

Matrix: q yBeoB,
Date Collected: 09-Ma5-18 16:30

Laboratory Data

Lab Sample: 1800936-0s
Date Received: 12-Ma5-18 09:7K

ColBm. : EHA C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-P4U. q	nS	8su2	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
13C2-P4Doq	nS	86u6	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1
13C2-P4TeDq	nS	K6u2	70 - 170		E8H01s6	23-Ma5-18	0u27s L	03-JB. -18 0s:s6	1

DL - Detectio. Limit
LOD - Limit of Detectio.
LOQ - Limit of yBa. titatio.
LCL-UCL- Lower co. trol limit - Bpper co. trol limit
Re, Blt, reported to the DLu
Whe. reportedIP4AxSIP4Oq a. d P4OS i. clBde both li. ear a. d bra. ched i, omer, u
O. l5 the li. ear i, omer i, reported for all other a. al5te, u

Sample ID: SK1DR0100180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I n cu
Project: Lapeer
Locatio. : 08. 11e33-SK01

Matrix: q yBeoB,
Date Collected: 09-Ma5-18 1R:0s

Laboratory Data

Lab Sample: 1800936-0s
Date v ecei2ed: 17-Ma5-18 09:sR

ColBm. : EHA C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFEq	3Rs-77-4	4u3s	0u367	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFPeq	7R06-90-3	1u7R	0u63s	7u48	3u9R	J	E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFES	3Rs-R3-s	7u09	0u888	7u48	3u9R	J	E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
4:7 FTS	RsR174-R7-4	ND	1u36	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFAxq	30R-74-4	ND	1u08	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFPeS	7R06-91-4	ND	1u36	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFApq	3Rs-8s-9	0uR37	0u793	7u48	3u9R	J	E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFAxS	3ss-46-4	0uR47	0u4R0	7u48	3u9R	J	E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
6:7 FTS	7R619-9R-7	4u93	1u07	7us s	4u08		E8F0041	08-JB. -18	0u74s L	10-JB. -18 10:0s	1
PFOq	33s-6R-1	7ul 8	0u373	7u48	3u9R	J	E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFApS	3Rs-97-8	ND	0u46s	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFNq	3Rs-9s-1	ND	0u407	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFOSq	Rs4-91-6	ND	0u8R8	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFOS	1R63-73-1	17u0	0u400	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFDq	33s-R6-7	ND	0uR39	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
8:7 FTS	39108-34-4	ND	1u07	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFNS	687s9-17-1	ND	1u97	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
MeFOSq q	73ss-31-9	ND	0u819	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
HtFOSq q	7991-s0-6	ND	0u680	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFU. q	70s8-94-8	ND	0us 71	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFDS	33s-RR-3	ND	0u610	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFDoq	30R-ss-1	ND	0u393	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFTrDq	R7679-94-8	ND	0u74s	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
PFTeDq	3R6-06-R	ND	0u3Rs	7u48	3u9R		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFEq	nS	93u3	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
13C3-PFPeq	nS	96uR	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
13C3-PFES	nS	111	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
13C7-PFAxq	nS	99u8	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
13C4-PFApq	nS	10R	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
18O7-PFAxS	nS	100	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
13C7-PFOq	nS	90uR	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
13Cs-PFNq	nS	R8u3	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
13C8-PFOSq	nS	RRus	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
13C8-PFOS	nS	94u0	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
13C7-PFDq	nS	83us	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
d3-MeFOSq q	nS	8Ru3	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
ds-HtFOSq q	nS	103	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1

Sample ID: SK1DR0100180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I n cu
Project: Lapeer
Locatio. : 08. 11e33-SK01

Matrix: q yBeoB,
Date Collected: 09-Ma5-18 1R:0s

Laboratory Data

Lab Sample: 1800936-0s
Date v ecei2ed: 17-Ma5-18 09:sR

ColBm. : EHA C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C7-PFU. q	nS	RRus	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
13C7-PFDoq	nS	83ul	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1
13C7-PFTeDq	nS	R6u7	s0 - 1s0		E8H0146	73-Ma5-18	0u7s7 L	03-JB. -18 04:sR	1

DL - Detectio. Limit
LOD - Limit of Detectio.
LOQ - Limit of yBa. titatio.
LCL-UCL- Lower co. trol limit - Bpper co. trol limit
v e, Blt, reported to the DLu
Whe. reportedI PFAxSI PFOq a. d PFOS i. clBde both li. ear a. d bra. ched i, omer, u
O. l5 the li. ear i, omer i, reported for all other a. al5te, u

Sample ID: SK1SW0300180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n11e33-SK01
Matrix: Aqueous
Date Collected: 09-May-18 15:1R

Laboratory Data

Lab Sample: 1800936-06
Date v ecei2ed: 17-May-18 09:R5
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	35R-77-4	6.05	0.408	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFPeA	7506-90-3	1.44	0.515	7.80	4.48	J	B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFBS	35R-53-R	ND	1.00	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
4:7 FTS	5R5174-57-4	ND	1.R3	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFHxA	305-74-4	ND	1.77	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFPeS	7506-91-4	ND	1.R3	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFHpA	35R-8R-9	0.816	0.331	7.80	4.48	J	B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFHxS	3RR-46-4	ND	0.R30	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
6:7 FTS	75619-95-7	ND	0.997	7.48	3.95		B8F0041	08-Jun-18	0.7R7 L	10-Jun-18 10:1R	1
PFOA	33R-65-1	0.R9R	0.364	7.80	4.48	J	B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFHpS	35R-97-8	ND	0.R7R	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFNA	35R-9R-1	ND	0.4R3	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFOSA	5R4-91-6	ND	0.991	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFOS	1563-73-1	ND	0.4R7	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFDA	33R-56-7	ND	0.834	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
8:7 FTS	39108-34-4	ND	1.1R	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFNS	687R9-17-1	ND	7.15	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
MeFOSAA	73RR-31-9	ND	0.974	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
EtFOSAA	7991-R0-6	ND	0.565	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFUnA	70R8-94-8	ND	0.R88	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFDS	33R-55-3	ND	0.689	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFDoA	305-RR-1	ND	0.443	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFTrDA	57679-94-8	ND	0.755	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
PFTeDA	356-06-5	ND	0.473	7.80	4.48		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	91.3	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
13C3-PFPeA	IS	86.3	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
13C3-PFBS	IS	98.9	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
13C7-PFHxA	IS	89.1	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
13C4-PFHpA	IS	93.1	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
18O7-PFHxS	IS	94.R	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
13C7-PFOA	IS	80.8	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
13CR-PFNA	IS	91.9	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
13C8-PFOSA	IS	85.4	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
13C8-PFOS	IS	94.7	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
13C7-PFDA	IS	93.1	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
d3-MeFOSAA	IS	107	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
dR-EtFOSAA	IS	99.9	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1

Sample ID: SK1SW0300180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n11e33-SK01
Matrix: Aqueous
Date Collected: 09-May-18 15:1R

Laboratory Data

Lab Sample: 1800936-06
Date v ecei2ed: 17-May-18 09:R5
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C7-PFUnA	IS	93.9	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
13C7-PFDoA	IS	58.4	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1
13C7-PFTeDA	IS	53.8	R0 - 1R0		B8E0146	73-May-18	0.773 L	03-Jun-18 0R:05	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
v esults reported to the DL.

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

Sample ID: SK1DR0400180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I n cu
Project: Lapeer
Locatio. : 08. 11e33-SK01

Matrix: q yBeoB,
Date Collected: 09-Ma5-18 1s:R0

Laboratory Data

Lab Sample: 1800936-0s
Date v ecei2ed: 1R-Ma5-18 09:7s

ColBm. : EHA C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFEq	3s7-RR-J	Ru81	0u86R	RuJ9	3u98	4	E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFPeq	Rs06-90-3	ND	0u636	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFES	3s7-s3-7	1uJ0	0u890	RuJ9	3u98	4	E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
J:RFTS	s7s1RJ-sR-J	ND	1u86	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFAxq	30s-RJ-J	ND	1u08	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFPeS	Rs06-91-J	ND	1u86	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFApq	3s7-87-9	0u801	0uR9J	RuJ9	3u98	4	E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFAxS	377-J6-J	Ru70	0uJs1	RuJ9	3u98	4	E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
6:RFTS	Rs619-9s-R	ND	0u99J	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFOq	337-6s-1	3u0s	0u8RJ	RuJ9	3u98	4	E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFApS	3s7-9R-8	ND	0uJ66	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFNq	3s7-97-1	ND	0uJ03	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFOSq	s7J-91-6	ND	0u880	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFOS	1s63-R3-1	7u78	0uJ01	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFDq	337-s6-R	ND	0usJ1	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
8:RFTS	39108-3J-J	ND	1u0R	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFNS	68R79-1R-1	ND	1u9R	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
MeFOSq q	R377-31-9	ND	0u8R0	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
HtFOSq q	R991-70-6	ND	0u681	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFU. q	R078-9J-8	ND	0u7RR	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFDS	337-ss-3	ND	0u611	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFDoq	30s-77-1	ND	0u89J	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFTrDq	sR6R9-9J-8	ND	0uRJ6	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
PFTeDq	3s6-06-s	ND	0u8s7	RuJ9	3u98		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFEq	nS	93u8	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
13C3-PFPeq	nS	100	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
13C3-PFES	nS	113	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
13CR-PFAxq	nS	96u7	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
13CJ-PFApq	nS	99u8	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
18OR-PFAxS	nS	101	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
13CR-PFOq	nS	83u9	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
13C7-PFNq	nS	8Jus	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
13C8-PFOSq	nS	s8u9	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
13C8-PFOS	nS	93uJ	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
13CR-PFDq	nS	88uR	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
d3-MeFOSq q	nS	88uJ	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
d7-HtFOSq q	nS	97u7	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1

Sample ID: SK1DR0400180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratorie, I n cu
Project: Lapeer
Locatio. : 08. 11e33-SK01

Matrix: q yBeoB,
Date Collected: 09-Ma5-18 1s:R0

Laboratory Data

Lab Sample: 1800936-0s
Date v ecei2ed: 1R-Ma5-18 09:7s

ColBm. : EHA C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13CR-PFU. q	nS	s6u0	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
13CR-PFDoq	nS	9Ju3	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1
13CR-PFTeDq	nS	sRu6	70 - 170		E8H01J6	R3-Ma5-18	0uR71 L	03-4B. -18 07:18	1

DL - Detectio. Limit
LOD - Limit of Detectio.
LOQ - Limit of yBa. titatio.
LCL-UCL- Lower co. trol limit - Bpper co. trol limit
v e, Blt, reported to the DLu
Whe. reportedI PFAxSI PFOq a. d PFOS i. clBde both li. ear a. d bra. ched i, omer, u
O. l5 the li. ear i, omer i, reported for all other a. al5te, u

Sample ID: SK1DR0800150809N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n11e33-SK01
Matrix: Aqueous
Date Collected: 09-May-18 15:30

Laboratory Data

Lab Sample: 1800936-08
Date Received: 12-May-18 09:75
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	357-22-4	3.97	0.378	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFPeA	2506-90-3	2.49	0.628	2.47	3.93	J	B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFBS	357-53-7	11.4	0.859	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
4:2 FTS	575124-52-4	ND	1.34	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFHxA	305-24-4	ND	1.05	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFPeS	2506-91-4	ND	1.34	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFHpA	357-87-9	3.17	0.290	2.47	3.93	J	B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFHxS	377-46-4	2.02	0.467	2.47	3.93	J	B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
6:2 FTS	25619-95-2	10.6	0.993	2.48	3.95		B8F0041	08-Jun-18	0.272 L	10-Jun-18 10:26	1
PFOA	337-65-1	8.13	0.320	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFHpS	357-92-8	ND	0.460	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFNA	357-97-1	0.703	0.398	2.47	3.93	J	B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFOSA	574-91-6	ND	0.869	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFOS	1563-23-1	90.2	0.396	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFDA	337-56-2	ND	0.531	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
8:2 FTS	39108-34-4	ND	1.01	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFNS	68279-12-1	ND	1.90	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
MeFOSAA	2377-31-9	ND	0.810	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
EtFOSAA	2991-70-6	ND	0.652	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFUnA	2078-94-8	ND	0.717	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFDS	337-55-3	ND	0.604	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFDoA	305-77-1	ND	0.389	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFTrDA	52629-94-8	ND	0.242	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
PFTeDA	356-06-5	ND	0.351	2.47	3.93		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	93.0	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
13C3-PFPeA	IS	90.6	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
13C3-PFBS	IS	96.1	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
13C2-PFHxA	IS	90.1	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
13C4-PFHpA	IS	89.0	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
18O2-PFHxS	IS	88.4	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
13C2-PFOA	IS	85.7	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
13C7-PFNA	IS	59.3	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
13C8-PFOSA	IS	56.8	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
13C8-PFOS	IS	94.6	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
13C2-PFDA	IS	99.3	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
d3-MeFOSAA	IS	53.1	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
d7-EtFOSAA	IS	85.3	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1

Sample ID: SK1DR0800150809N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n11e33-SK01
Matrix: Aqueous
Date Collected: 09-May-18 15:30

Laboratory Data

Lab Sample: 1800936-08
Date Received: 12-May-18 09:75
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	53.7	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
13C2-PFDoA	IS	101	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1
13C2-PFTeDA	IS	54.0	70 - 170		B8E0146	23-May-18	0.277 L	03-Jun-18 07:28	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	**This compound was also detected in the method blank**
Conc.	**Concentration**
D	**Dilution**
DL	**Detection limit**
E	**The associated compound concentration exceeded the calibration range of the instrument**
H	**Recovery and/or RPD was outside laboratory acceptance limits**
I	**Chemical Interference**
J	**The amount detected is below the Reporting Limit/LOQ**
LOD	**Limits of Detection**
LOQ	**Limits of Quantitation**
M	**Estimated Maximum Possible Concentration (CA Region 2 projects only)**
NA	**Not applicable**
ND	**Not Detected**
Q	**Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)**
TEQ	**Toxic Equivalency**
U	**Not Detected (specific projects only)**
*****	**See Cover Letter**

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

CERTIFICATIONS

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	17-015-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-18
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2016026
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207717
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-008
Pennsylvania Department of Environmental Protection	014
Texas Commission on Environmental Quality	T104704189-17-8
Virginia Department of General Services	9077
Washington Department of Ecology	C584
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.

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800936 Temp: 1.7, 1.9 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: **Lapeer PFAS Biosolids Investigation** PO#: **60570635** Sampler: **Stan Krenz** (name)

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

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

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Dorin Bogdan	5/16/2018	17:30			
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

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

ATTN: Jennifer Miller

Method of Shipment: ~~FED EX~~

Tracking No.:

Add Analysis(es) Requested

Container(s)

PFAS Isotope Dilution

USEPA Method 537

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
SK1SW0200180509N	5/9/18	1505	08n11e33-SK01	2	P	AQ			X							
SK1SW0100180509N	5/9/18	1545	08n11e33-SK01	2	P	AQ			X							
SK1DR0300180509N	5/9/18	1615	08n11e33-SK01	2	P	AQ			X							
SK1DR0200180509N	5/9/18	1630	08n11e33-SK01	2	P	AQ			X							
SK1DR0100180509N	5/9/18	1705	08n11e33-SK01	2	P	AQ			X							
SK1SW0300180509N	5/9/18	1715	08n11e33-SK01	2	P	AQ			X							
SK1DR0400180509N	5/9/18	1720	08n11e33-SK01	2	P	AQ			X							
SK1DR0500180509N	5/9/18	1730	08n11e33-SK01	2	P	AQ			X							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street**
City: **Lansing** State: **MI** Zip: **48909**
Phone: **517-897-1597** Fax: **517-241-3571**
Email: dorin.bogdan@aecom.com

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

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

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

Revised COC - received from Dorin Bogdan 5/17/18 (JW)

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800936 Temp: 1.7, 1.9 °C
Storage ID: WR-2 Storage Secured: Yes [X] No [ ]

Project ID: **Lapeer** PO#: **60570635** Sampler: **Stan Krenz** (name)

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

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

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Stan Krenz	5-11-18	1245	Bettie Benedict	05/12/18	1030
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

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

ATTN: Jennifer Miller

Method of Shipment: ~~FED EX~~

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	PFAS Isotope Dilution: List of 21	List of 21 w/isomers	List of 24	List of 24 w/isomers	List of 28	Other: Please List Below	USEPA Method 537: PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
SK1SW0200180509N	5/9/18	1505	Lapeer	2	P	AQ			X							
SK1SW0100180509N	5/9/18	1545	Lapeer	2	P	AQ			X							
SK1DR0300180509N	5/9/18	1615	Lapeer	2	P	AQ			X							
SK1DR0200180509N	5/9/18	1630	Lapeer	2	P	AQ			X							
SK1DR0100180509N	5/9/18	1705	Lapeer	2	P	AQ			X							
SK1SW0300180509N	5/9/18	1715	Lapeer	2	P	AQ			X							
SK1DR0400180509N	5/9/18	1720	Lapeer	2	P	AQ			X							
SK1DR0500180509N	5/9/18	1730	Lapeer	2	P	AQ			X							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street**
City: **Lansing** State: **MI** Zip: **48909**
Phone: **517-897-1597** Fax: **517-241-3571**
Email: dorin.bogdan@aecom.com

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

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

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

Vista Analytical Laboratory

Sample Log-in Checklist

Vista Work Order #: 1800936 **TAT** std

Samples Arrival:	**Date/Time** 05/12/18 0957	**Initials:**	**Location:** WR-2 **Shelf/Rack:** NA
Logged In:	**Date/Time** 05/12/18 1201	**Initials:** MWS	**Location:** WR-2 **Shelf/Rack:** 3-4

Delivered By:	(FedEx)	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	(Ice)		Blue Ice		Dry Ice		None

Temp °C: 1.8 (uncorrected)	**Time:** 1028 MWS 05/12/18	**Thermometer ID:** IR-4
Temp °C: 1.7 (corrected)	**Probe used: Yes☑ No☐**	

	YES	NO	NA
Adequate Sample Volume Received?	MWS		
Holding Time Acceptable?	MWS		
Shipping Container(s) Intact?	BLB		
Shipping Custody Seals Intact?	BLB		
Shipping Documentation Present?	BLB		
Airbill 1 of 2 Trk # 7722 1188 4532	BLB		
Sample Container Intact?	MWS		
Sample Custody Seals Intact?			MWS
Chain of Custody / Sample Documentation Present?	BLB		
COC Anomaly/Sample Acceptance Form completed?		MWS	MWS

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

Comments:

Vista Analytical Laboratory

Sample Log-in Checklist

Vista Work Order #: 1800936 **TAT** std

Samples Arrival:	**Date/Time** 05/12/18 0957	**Initials:** BLB	**Location:** WR-2 **Shelf/Rack:** NA
Logged In:	**Date/Time** 05/12/18 1201	**Initials:** WWS	**Location:** WR-2 **Shelf/Rack:** 2-4

Delivered By:	(FedEx)	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	(Ice)		Blue Ice		Dry Ice		None

Temp °C: 2.0 (uncorrected)	**Time:** 1034	**Thermometer ID:** IR-4
Temp °C: 1.9 (corrected)	**Probe used:** Yes☐ No☑	

	YES	NO	NA
Adequate Sample Volume Received?	WWS		
Holding Time Acceptable?	WWS		
Shipping Container(s) Intact?	BLB		
Shipping Custody Seals Intact?	BLB		
Shipping Documentation Present?	BLB		
Airbill 2 of 2 Trk # 7722 1188 4554	BLB		
Sample Container Intact?	WWS		
Sample Custody Seals Intact?			WWS
Chain of Custody / Sample Documentation Present?		BLB	
COC Anomaly/Sample Acceptance Form completed?		WWS	WWS
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			WWS

Preservation Documented:	$Na_2S_2O_3$	Trizma	(None)	Yes	(No)	(NA)
Shipping Container	(Vista)	Client	Retain	Return	Dispose	

Comments:

Appendix D

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Memorandum

Project	Lapeer Area PFAS	Page 1
Laboratory	Vista Analytical Laboratory, El Dorado Hills, CA	
Laboratory Work Number	1800898	
Analyses/Method	Per- and Polyfluoroalkyl Substances (PFAS)/Vista Lab SOP No 49, Rev 10	
Validation Level	Limited	
AECOM Project Number	60570365-01	
Prepared by	Waverly Braunstein	
Reviewed by	Robert Kennedy	Completed: July 27, 2018

SUMMARY

A limited validation was performed for the samples collected on April 26, April 27, April 30, May 1, and May 2, 2018 at the Lapeer site. The samples were submitted to Vista Analytical Laboratory (Vista) in El Dorado Hills, CA for analysis. Vista reported the samples under laboratory work order number 1800898.

Sample IDs
CLIDU10100180501N
CLIDU10200180501N
CLIDU10300180501N
CLIDU20100180501N
CLIDU20200180501N
CLIDU20300180501N
CLIDU30100180502N
CLIDU30200180502N
CLIDU30300180502N
TGIDU10100180426N
TGIDU10200180427N
TGIDU10300180427N
TGIDU20100180430N
TGIDU20200180430N
TGIDU20300180430N
TGIDU30100180426N
TGIDU30200180426N
TGIDU30300180426N

Data validation activities were conducted with reference to:

- Vista Analytical Laboratory SOP: Preparation and Analysis for the Determination of Per- and Poly-Fluorinated Compounds (SOP No. 49, Revision 10);
- USEPA National Functional Guidelines for Organic Superfund Methods Data Review (January 2017); and

- USEPA National Functional Guidelines for High Resolution Superfund Methods Data Review (April 2016);

In the absence of method-specific information, laboratory quality control (QC) limits and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following review elements:

✓	Data completeness (chain-of-custody (COC)/sample integrity
✓	Holding times and sample preservation
✓	Initial calibration/initial calibration and continuing calibration verification
✓	Laboratory method blanks/field blanks
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Ongoing precision and recovery (OPR) results
NA	Field duplicate results
✗	Extracted internal standard results
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An "NA" indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. Select data points were qualified as estimated due to nonconformances of certain QC criteria (see discussion below).

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Holding Times and Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Initial Calibration/Initial and Continuing Calibration Verification

Calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- the initial calibration (ICAL) percent relative standard deviation (%RSD) or correlation coefficient (r)/coefficient of determination (r^2) method acceptance criteria were met;
- the initial calibration verification standard (ICV) percent recovery (%R) acceptance criteria were met; and
- the continuing calibration verification standard (CCV) frequency and method acceptance criteria were met.

All QC acceptance limits were met or qualification of the data was not required.

Laboratory Method Blanks/Field Blanks

Laboratory method blanks and field blanks are evaluated as to whether there are contaminants detected above the detection limit (DL). Target compounds were not detected in the method blank associated with the sample in this data set. A field blank was not submitted with the sample reported in this data set.

MS/MSD Results

MS/MSD analyses were not performed on a sample in this data set. No data validation actions were taken on this basis.

OPR Results

The OPR percent recoveries were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met or qualification of the data was not required.

Field Duplicate Results

Field duplicate samples were not submitted with this data set. No data validation actions were taken on this basis.

Extracted Internal Standard Results

The extracted internal standard (IS) results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met except for the extracted IS results summarized below.

Sample ID	Extraction IS	% Recovery	QC Limits	Associated Compounds
CLIDU10100180501N	13C8-PFOSA	49.70	50 - 150	PFOSA
CLIDU20100180501N	13C3-PFBA	43.00	50 - 150	PFBA
CLIDU20200180501N	13C3-PFBA	30.40	50 - 150	PFBA
CLIDU20200180501N	13C8-PFOSA	47.50	50 - 150	PFOSA
CLIDU20300180501N	13C3-PFBA	41.10	50 - 150	PFBA
CLIDU20300180501N	13C8-PFOSA	42.70	50 - 150	PFOSA

Samples were qualified as follows (based on NFG 2016):

Criteria	Actions[1]	
	Detected	Nondetected
%R > Upper Acceptance Limit	J	UJ
%R >10% but < Lower Acceptance Limit	J	UJ
%R <10%	See below	
<10% and S/N >10:1	J	R
<10% and S/N <10:1	R	R
[1]The PFAS method is performed using isotope dilution technique; therefore, professional judgment was applied and bias codes were not included in data qualification.		

Qualified sample results are summarized in Table 1.

Sample Results/Reporting Issues

If applicable, compounds detected at concentrations less than the level of quantitation (LOQ) but greater than the DL are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

It should be noted that the overall bias is considered to be indeterminate in cases where cumulative nonconformances do not show a consistent bias or in cases of the presence of conflicting high and low biases.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Qualifier Codes and Explanations

Attachment B: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	LOQ	Units	Validation Qualifiers	Validation Reason
CLIDU20100180501N	SO	Perfluorobutanoic acid	0.497	1.38	2.77	ng/g	J	lc
CLIDU20100180501N	SO	Perfluorooctane sulfonamide		1.38	2.77	ng/g	UJ	lc
CLIDU20200180501N	SO	Perfluorobutanoic acid	0.646	1.17	2.33	ng/g	J	lc
CLIDU20200180501N	SO	Perfluorooctane sulfonamide	0.319	1.17	2.33	ng/g	J	lc
CLIDU20300180501N	SO	Perfluorobutanoic acid	0.572	1.22	2.44	ng/g	J	lc
CLIDU20300180501N	SO	Perfluorooctane sulfonamide	0.558	1.22	2.44	ng/g	J	lc

Attachment A

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential low bias.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential high bias.
JN	The analyte was tentatively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment B

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas (including recovery standards)
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Extracted internal standard recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

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Memorandum

Project	Lapeer Area PFAS	Page 1
Laboratory	Vista Analytical Laboratory, El Dorado Hills, CA	
Laboratory Work Number	1800937	
Analyses/Method	Per- and Polyfluoroalkyl Substances (PFAS)/Vista Lab SOP No 49, Rev 10	
Validation Level	Limited	
AECOM Project Number	60570365-01	
Prepared by	Paula DiMattei	
Reviewed by	Robert Kennedy	Completed: July 27, 2018

SUMMARY

A limited validation was performed for the samples collected on May 3, 4, 8, and 9, 2018 at the Lapeer site. The samples were submitted to Vista Analytical Laboratory (Vista) in El Dorado Hills, CA for analysis. Vista reported the samples under laboratory work order number 1800937.

Sample IDs
CL1DR0100180508N
CL1DR0200180509N
CL1DR0300180508N
CL1SW0100180509N
CL1SW0200180509N
CL1SW0300180508N
CL1SW0400180508N
CL1SW0500180508N
CL1TMW0118180503N
CL1TMW0405180504N

Data validation activities were conducted with reference to:

- Vista Analytical Laboratory SOP: Preparation and Analysis for the Determination of Per- and Poly-Fluorinated Compounds (SOP No. 49, Revision 10);
- USEPA National Functional Guidelines for Organic Superfund Methods Data Review (January 2017); and
- USEPA National Functional Guidelines for High Resolution Superfund Methods Data Review (April 2016);

In the absence of method-specific information, laboratory quality control (QC) limits and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following review elements:

✓	Data completeness (chain-of-custody (COC)/sample integrity
✗	Holding times and sample preservation
✓	Initial calibration/initial calibration and continuing calibration verification
✓	Laboratory method blanks/field blanks
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Ongoing precision and recovery (OPR) results
NA	Field duplicate results
✗	Extracted internal standard results
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An "NA" indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. Select data points were qualified as estimated due to nonconformances of certain QC criteria (see discussion below).

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Holding Times and Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria. All samples were initially extracted and analyzed within holding times. However, samples CL1DR0200180509N and CL1TMW0405180504N were re-extracted outside of holding time because perfluoroundecanoic acid and perfluorodecane sulfonic acid were detected in the these samples in the original analysis and the recoveries in the associated OPR exceeded the upper acceptance limits. These results were reported from the re-extraction as they were associated with compliant OPR recoveries. Professional judgment, as stipulated in the NFG, was applied to qualify these results as estimated (J).

Initial Calibration/Initial and Continuing Calibration Verification

Calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- the initial calibration (ICAL) percent relative standard deviation (%RSD) or correlation coefficient (r)/coefficient of determination (r^2) method acceptance criteria were met;
- the initial calibration verification standard (ICV) percent recovery (%R) acceptance criteria were met; and
- the continuing calibration verification standard (CCV) frequency and method acceptance criteria were met.

All QC acceptance limits were met or qualification of the data was not required.

Laboratory Method Blanks/Field Blanks

Laboratory method blanks and field blanks are evaluated as to whether there are contaminants detected above the detection limit (DL). Target compounds were not detected in the method blank associated with the sample in this data set. A field blank was not submitted with the sample reported in this data set.

MS/MSD Results

MS/MSD analyses were not performed on a sample in this data set. No data validation actions were taken on this basis.

OPR Results

The OPR percent recoveries were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met or qualification of the data was not required.

Field Duplicate Results

Field duplicate samples were not submitted with this data set. No data validation actions were taken on this basis.

Extracted Internal Standard Results

The extracted internal standard (IS) results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met except for the extracted IS results summarized below.

Sample ID	Extraction IS	% Recovery	QC Limits	Associated Compounds
CL1DR0200180509N	13C8PFOSA	41.4	50 – 150	PFOSA
CL1TMW0118180503N	13C8PFOSA	45.2	50 – 150	PFOSA
CL1TMW0405180504N	13C8PFOSA	34.3	50 – 150	PFOSA

Samples were qualified as follows (based on NFG 2016):

Criteria	Actions[1]	
	Detected	Nondetected
%R > Upper Acceptance Limit	J	UJ
%R >10% but < Lower Acceptance Limit	J	UJ
%R <10%	See below	

Criteria	Actions[1]	
	Detected	Nondetected
<10% and S/N >10:1	J	R
<10% and S/N <10:1	R	R
[1]The PFAS method is performed using isotope dilution technique; therefore, professional judgment was applied and bias codes were not included in data qualification.		

Qualified sample results are summarized in Table 1.

Sample Results/Reporting Issues

If applicable, compounds detected at concentrations less than the level of quantitation (LOQ) but greater than the DL are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

It should be noted that the overall bias is considered to be indeterminate in cases where cumulative nonconformances do not show a consistent bias or in cases of the presence of conflicting high and low biases.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Qualifier Codes and Explanations

Attachment B: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	LOQ	Units	Validation Qualifiers	Validation Reason
CL1DR0200180509N	WG	Perfluorooctane sulfonamide		2.51	4.01	ng/l	UJ	lc
CL1DR0200180509N	WG	Perfluoroundecanoic acid	2.41	2.49	3.98	ng/l	J	h
CL1DR0200180509N	WG	Perfluorodecanesulfonic acid	1.17	2.49	3.98	ng/l	J	h
CL1TMW0118180503N	WG	Perfluorooctane sulfonamide		2.47	3.96	ng/l	UJ	lc
CL1TMW0405180504N	WG	Perfluorooctane sulfonamide	12.1	2.47	3.96	ng/l	J	lc
CL1TMW0405180504N	WG	Perfluoroundecanoic acid	10.0	2.45	3.93	ng/l	J	h
CL1TMW0405180504N	WG	Perfluorodecanesulfonic acid	2.03	2.45	3.93	ng/l	J	h

Attachment A

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential low bias.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential high bias.
JN	The analyte was tentatively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment B

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas (including recovery standards)
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Extracted internal standard recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

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Memorandum

Project	Lapeer Area PFAS	Page 1
Laboratory	Vista Analytical Laboratory, El Dorado Hills, CA	
Laboratory Work Number	1800896, 1800897, 1800899, 1800933, 1800934, 1800936, and 1800938	
Analyses/Method	Per- and Polyfluoroalkyl Substances (PFAS)/Vista Lab SOP No 49, Rev 10	
Validation Level	Level 1 Plus	
AECOM Project Number	60570365-01	
Prepared by	Waverly Braunstein	
Reviewed by	Robert Kennedy	Completed: August 5, 2018

SUMMARY

A limited validation was performed for the samples collected on April 26 through May 10, 2018 at the Lapeer site. This 'Level 1 Plus' review excluded calibration but included all batch QC elements listed below. The samples were submitted to Vista Analytical Laboratory (Vista) in El Dorado Hills, CA for analysis. Vista reported the samples under laboratory work order numbers 1800896, 1800897, 1800899, 1800933, 1800934, 1800936, and 1800938.

Work Order	Sample IDs	Laboratory ID	Matrix
1800896	SKITMW113180501N	1800896-01	Groundwater
1800896	SKITMW211180501N	1800896-02	Groundwater
1800896	SKITMW308180430N	1800896-03	Groundwater
1800896	SKITMW410180430N	1800896-04	Groundwater
1800896	SKITMW506180430N	1800896-05	Groundwater
1800896	SKITMW606180501N	1800896-06	Groundwater
1800896	EB01-180426	1800896-07	Equipment/field blank
1800896	QC-180426	1800896-08	Equipment/field blank
1800896	EB01-180427	1800896-09	Equipment/field blank
1800896	QC1-180430	1800896-10	Equipment/field blank
1800896	FB1-180430	1800896-11	Equipment/field blank
1800896	EB1-180430	1800896-12	Equipment/field blank
1800896	FB1-180502	1800896-13	Equipment/field blank
1800897	TG1TMW318180502N	1800897-01	Groundwater
1800897	TG1-2-TMW1	1800897-02	Soil
1800897	TG1-2-TMW2	1800897-03	Soil
1800897	TG1-2-TMW4	1800897-04	Soil
1800897	TG1-2-TMW5	1800897-05	Soil
1800897	TG1-2-TMW6	1800897-06	Soil
1800899	SKIDU30300180427N	1800899-01	Soil
1800899	SKIDU30200180427N	1800899-02	Soil
1800899	SKIDU30100180427N	1800899-03	Soil
1800899	SKIDU20100180427N	1800899-04	Soil
1800899	SKIDU20200180427N	1800899-05	Soil
1800899	SKIDU20300180427N	1800899-06	Soil

Work Order	Sample IDs	Laboratory ID	Matrix
1800899	SKIDU10100180427N	1800899-07	Soil
1800899	SKIDU10200180427N	1800899-08	Soil
1800899	SKIDU10300180427N	1800899-09	Soil
1800933	FB1-180503	1800933-01	Equipment/field blank
1800933	FB1-180504	1800933-02	Equipment/field blank
1800933	QC1-180504	1800933-03	Equipment/field blank
1800933	QC1-180509	1800933-04	Equipment/field blank
1800933	FB01-180509	1800933-05	Equipment/field blank
1800933	FB02-180509	1800933-06	Equipment/field blank
1800933	FB03-180509	1800933-07	Equipment/field blank
1800933	FB1-180510	1800933-08	Equipment/field blank
1800934	TG1SW0300180509N	1800934-01	Groundwater
1800934	TG1SW0200180509N	1800934-02	Groundwater
1800934	TG1SW0100180509N	1800934-03	Groundwater
1800936	SK1SW0200180509N	1800936-01	Groundwater
1800936	SK1SW0100180509N	1800936-02	Groundwater
1800936	SK1DR0300180509N	1800936-03	Groundwater
1800936	SK1DR0200180509N	1800936-04	Groundwater
1800936	SK1DR0100180509N	1800936-05	Groundwater
1800936	SK1SW0300180509N	1800936-06	Groundwater
1800936	SK1DR0400180509N	1800936-07	Groundwater
1800936	SK1DR0500180509N	1800936-08	Groundwater
1800938	CL1MW0124180510N	1800938-01	Groundwater
1800938	CL1MW0324180510N	1800938-02	Groundwater
1800938	CL1MW0229180510N	1800938-03	Groundwater
1800938	CL1MW0414180510N	1800938-04	Groundwater
1800896	SKITMW113180501N	1800896-01	Groundwater
1800896	SKITMW211180501N	1800896-02	Groundwater
1800896	SKITMW308180430N	1800896-03	Groundwater

Data validation activities were conducted with reference to:

- Vista Analytical Laboratory SoilP: Preparation and Analysis for the Determination of Per- and Poly-Fluorinated Compounds (SoilP No. 49, Revision 10);
- USEPA National Functional Guidelines for Organic Superfund Methods Data Review (January 2017); and
- USEPA National Functional Guidelines for High Resolution Superfund Methods Data Review (April 2016);

In the absence of method-specific information, laboratory quality control (QC) limits and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following review elements:

✓ Data completeness (chain-of-custody (COC)/sample integrity

✓ Holding times and sample preservation
✗ Laboratory method blanks/field blanks
NA Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✗ Ongoing precision and recovery (OPR) results
NA Field duplicate results
✗ Extracted internal standard results
✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An "NA" indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. Select data points were negated or qualified as estimated due to nonconformances of certain QC criteria (see discussion below). No data were rejected

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

No significant issues were encountered.

Holding Times and Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

All samples were initially extracted and analyzed within holding times. The samples tabulated below were re-extracted outside of holding times because 6:2 Fluorotelomer sulfonic acid was detected above the quantitation limit in one or more method blanks.

SampleID
FB1-180502
TG1SW0100180509N
TG1SW0200180509N
TG1SW0300180509N
SK1DR0100180509N
SK1DR0200180509N

SampleID
SK1DR0300180509N
SK1DR0500180509N
SK1SW0100180509N
SK1SW0200180509N
SK1SW0300180509N
CL1MW0124180510N
CL1MW0229180510N
CL1MW0414180510N

Laboratory Method Blanks/Field Blanks

Laboratory method blanks and field blanks are evaluated as to whether there are contaminants detected above the detection limit (DL). Target compounds were not detected in the method blank associated with the sample in this data set. In general, method blanks were free from contamination or the associated samples were re-extracted. There were two exceptions to this resulting in the negation of perfluorooctanoic acid in sample TG1TMW318180502N, and 6:2 fluorotelomer sulfonic acid in sample CL1MW0324180510N.

Multiple field and equipment blanks were submitted with the sample reported in these data sets. The results were not used to qualify data, but were used for informational purposes only. No elevated or systematic contamination issues were noted. The following table summarizes all detected compounds in all field and equipment blanks.

Sample ID	Compound	Result (ng/L)	Quantitation Limit (ng/L)
EB01-180426	Perfluorooctanesulfonic acid	1.59	3.80
EB01-180426	Perfluorooctanoic acid	1.63	3.80
QC1-180504	Perfluoroheptanoic acid	0.432	3.89
QC1-180504	Perfluorohexanesulfonic acid	0.562	3.89
QC1-180504	Perfluorooctanesulfonic acid	0.928	3.89
QC1-180504	Perfluorooctanoic acid	1.13	3.89
FB02-180509	Perfluorooctanesulfonic acid	1.18	3.87

MS/MSD Results

MS/MSD analyses were not performed on a sample in this data set. No data validation actions were taken on this basis.

OPR Results

The OPR percent recoveries were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met or qualification of the data was not required, with the exception of the perfluorooctanesulfonic acid results in samples FB02-180509 and QC1-180504, which were qualified as estimated with a potential high bias due to elevated OPR recoveries.

Field Duplicate Results

Field duplicate samples were not submitted with this data set. No data validation actions were taken on this basis.

Extracted Internal Standard Results

The extracted internal standard (IS) results were reviewed for conformance with the QC acceptance criteria. In general, the recoveries met the acceptance limits. However, there were minor

nonconformances that resulted in qualification of the results as estimated (J/UJ). Details can be found in the validation worksheets.

Sample Results/Reporting Issues

If applicable, compounds detected at concentrations less than the level of quantitation (LOQ) but greater than the DL are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

It should be noted that the overall bias is considered to be indeterminate in cases where cumulative nonconformances do not show a consistent bias or in cases of the presence of conflicting high and low biases.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Qualifier Codes and Explanations

Attachment B: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	LOQ	Units	Validation Qualifiers	Validation Reason
EB01-180426	WQ	Perfluorooctane sulfonamide		2.38	3.80	ng/l	UJ	lc
EB01-180427	WQ	Perfluorooctane sulfonamide		2.57	4.11	ng/l	UJ	lc
FB1-180430	WQ	Perfluorooctane sulfonamide		2.37	3.79	ng/l	UJ	lc
FB1-180502	WQ	Perfluorooctanesulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluoroundecanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorooctane sulfonamide		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	4:2 FLUOROTELOMER SULFONIC ACID		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	PERFLUORONONANE SULFONIC ACID		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorotridecanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorotetradecanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	8:2 Fluorotelomer sulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluoroheptanesulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorononanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorobutanesulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluoroheptanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorohexanesulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorobutanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorodecanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorodecanesulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorododecanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorooctanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	EtFOSAA		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorohexanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	PERFLUOROPENTANE SULFONIC ACID		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	6:2 Fluorotelomer sulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	MeFOSAA		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluoropentanoic acid		2.44	3.91	ng/l	UJ	h
QC1-180430	WQ	Perfluorooctane sulfonamide		2.38	3.80	ng/l	UJ	lc
QC-180426	WQ	Perfluorooctane sulfonamide		2.41	3.86	ng/l	UJ	lc
SKITMW113180501N	WG	Perfluorooctane sulfonamide		2.39	3.82	ng/l	UJ	lc
SKITMW113180501N	WG	Perfluorobutanesulfonic acid	11.2	2.39	3.82	ng/l	J	lc
SKITMW211180501N	WG	Perfluorobutanesulfonic acid	44.9	2.39	3.82	ng/l	J	lc
SKITMW308180430N	WG	Perfluorooctane sulfonamide		2.53	4.05	ng/l	UJ	lc
SKITMW410180430N	WG	Perfluorooctane sulfonamide		2.41	3.86	ng/l	UJ	lc
SKITMW506180430N	WG	Perfluorobutanesulfonic acid	9.97	2.41	3.86	ng/l	J	lc
TG1TMW318180502N	WG	Perfluorooctanoic acid		3.96	3.96	ng/l	U	bl
TG1-2-TMW1	SO	Perfluorooctane sulfonamide		1.08	2.15	ng/g	UJ	lc
TG1-2-TMW1	SO	Perfluorobutanoic acid		1.08	2.15	ng/g	UJ	lc
TG1-2-TMW2	SO	Perfluorooctane sulfonamide		1.05	2.10	ng/g	UJ	lc
TG1-2-TMW2	SO	Perfluorobutanoic acid		1.05	2.10	ng/g	UJ	lc

Sample ID	Matrix	Compound	Result	LOD	LOQ	Units	Validation Qualifiers	Validation Reason
TG1-2-TMW4	SO	Perfluorooctane sulfonamide		1.05	2.10	ng/g	UJ	lc
TG1-2-TMW5	SO	Perfluorooctane sulfonamide		1.09	2.19	ng/g	UJ	lc
TG1-2-TMW5	SO	Perfluorobutanoic acid		1.09	2.19	ng/g	UJ	lc
TG1-2-TMW6	SO	Perfluorooctane sulfonamide		1.04	2.08	ng/g	UJ	lc
TG1-2-TMW6	SO	Perfluorobutanoic acid		1.04	2.08	ng/g	UJ	lc
FB01-180509	WQ	Perfluorooctane sulfonamide		2.38	3.80	ng/l	UJ	lc
FB02-180509	WQ	Perfluorooctanesulfonic acid	1.18	2.42	3.87	ng/l	J+	l
FB02-180509	WQ	Perfluorooctane sulfonamide		2.42	3.87	ng/l	UJ	lc
FB03-180509	WQ	Perfluorooctane sulfonamide		2.40	3.85	ng/l	UJ	lc
FB1-180503	WQ	Perfluorooctane sulfonamide		2.41	3.86	ng/l	UJ	lc
FB1-180504	WQ	Perfluorooctane sulfonamide		2.45	3.93	ng/l	UJ	lc
FB1-180510	WQ	Perfluorooctane sulfonamide		2.44	3.91	ng/l	UJ	lc
QC1-180504	W	Perfluorooctanesulfonic acid	0.928	2.43	3.89	ng/l	J+	l
QC1-180504	W	Perfluorooctane sulfonamide		2.43	3.89	ng/l	UJ	lc
QC1-180509	W	Perfluorooctane sulfonamide		2.43	3.89	ng/l	UJ	lc
TG1SW0100180509N	WG	Perfluorooctanesulfonic acid	1.64	2.63	4.20	ng/l	J+	l
TG1SW0100180509N	WG	Perfluorotridecanoic acid		2.63	4.20	ng/l	UJ	lc
TG1SW0100180509N	WG	Perfluorotetradecanoic acid		2.63	4.20	ng/l	UJ	lc
TG1SW0100180509N	WG	6:2 Fluorotelomer sulfonic acid		2.48	3.97	ng/l	UJ	h
TG1SW0200180509N	WG	EtFOSAA		2.48	3.96	ng/l	UJ	lc
TG1SW0200180509N	WG	MeFOSAA		2.48	3.96	ng/l	UJ	lc
TG1SW0200180509N	WG	6:2 Fluorotelomer sulfonic acid		2.50	4.00	ng/l	UJ	h
TG1SW0300180509N	WG	Perfluorooctane sulfonamide		2.49	3.99	ng/l	UJ	lc
TG1SW0300180509N	WG	Perfluorotridecanoic acid		2.49	3.99	ng/l	UJ	lc
TG1SW0300180509N	WG	Perfluorotetradecanoic acid		2.49	3.99	ng/l	UJ	lc
TG1SW0300180509N	WG	EtFOSAA		2.49	3.99	ng/l	UJ	lc
TG1SW0300180509N	WG	MeFOSAA		2.49	3.99	ng/l	UJ	lc
TG1SW0300180509N	WG	6:2 Fluorotelomer sulfonic acid	9.90	2.53	4.05	ng/l	J-	h
SK1DR0100180509N	WG	6:2 Fluorotelomer sulfonic acid	4.93	2.55	4.08	ng/l	J	h
SK1DR0200180509N	WG	6:2 Fluorotelomer sulfonic acid	6.28	2.45	3.92	ng/l	J	h
SK1DR0300180509N	WG	6:2 Fluorotelomer sulfonic acid		2.56	4.10	ng/l	UJ	h
SK1DR0500180509N	WG	6:2 Fluorotelomer sulfonic acid	10.6	2.48	3.97	ng/l	J	h
SK1SW0100180509N	WG	6:2 Fluorotelomer sulfonic acid		2.47	3.95	ng/l	UJ	h
SK1SW0200180509N	WG	6:2 Fluorotelomer sulfonic acid		2.57	4.12	ng/l	UJ	h
SK1SW0300180509N	WG	6:2 Fluorotelomer sulfonic acid		2.48	3.97	ng/l	UJ	h
CL1MW0124180510N	WG	6:2 Fluorotelomer sulfonic acid		2.38	3.81	ng/l	UJ	h
CL1MW0229180510N	WG	6:2 Fluorotelomer sulfonic acid		2.50	4.00	ng/l	UJ	h
CL1MW0324180510N	WG	6:2 Fluorotelomer sulfonic acid		3.96	3.96	ng/l	U	bl
CL1MW0414180510N	WG	6:2 Fluorotelomer sulfonic acid	4.03	2.48	3.97	ng/l	J	h

Attachment A

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential low bias.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential high bias.
JN	The analyte was tentatively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment B

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas (including recovery standards)
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Extracted internal standard recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

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