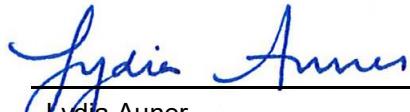


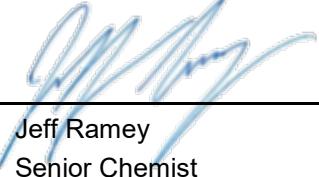
Phase 1: Initial PFAS Characterization

Evaluation of PFAS Sampling Results from Madison Metropolitan Sewerage District's Nine Springs Wastewater Treatment Plant

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ACRONYM LIST

ADONA	4,8-dioxa-3H-perfluororononanoic acid
AFFF	aqueous film-forming foam
CSM	conceptual site model
DEP	Department of Environmental Protection
EGLE	Environment, Great Lakes, and Energy
FOSA	perfluorooctanesulfonamide
FTSs	fluorotelomer sulfonic acids
IPP	Industrial Pretreatment Program
LDPE	low-density polyethylene
MMSD	Madison Metropolitan Sewerage District
NEtFOSAA	N-ethylperfluorooctanesulfonamido acetic acid
NEtFOSE	N-ethylperfluoroocanesulfonamido ethanol
ng/L	nanograms per liter
NMeFOSAA	N-methylperfluorooctanesulfonamido acetic acid
NMeFOSE	N-methylperfluorooctanesulfonamido ethanol
PFAAs	perfluoroalkyl acids
PFAS	per- and polyfluoroalkyl substances
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFCAs	perfluorocarboxylic acids
PFDS	perfluorodecanesulfonic acid
PFHxA	perfluorohexanoic acid
PFHxDA	perfluorohexadecanoic acid
PFHxS	perfluorohexane sulfonic acid
PFNA	perfluororononanoic acid
PFOA	perfluorooctanoic acid
PFODA	perfluorooctadecanoic acid
PFOS	perfluorooctanesulfonic acid
PPPeA	perfluoropentanoic acid
PFSAs	perfluorosulfonic acids
ppb	parts per billion
ppt	parts per trillion
SAB	sampling and analysis blueprint
SOP	standard operating procedure
TOP	total oxidizable precursor
ug/kg	micrograms per kilogram
WDNR	Wisconsin Department of Natural Resources
WI	Wisconsin
WWTP	wastewater treatment plant

Executive Summary

Per- and polyfluoroalkyl substances (PFAS) are a group of over 9,000 synthetic chemicals that have been manufactured since the 1940s and are used in a variety of industrial and commercial products and processes. Some PFAS are resistant to degradation, are known to persist and be mobile once introduced into the environment, and have the potential to bioaccumulate. In addition, some PFAS have demonstrated toxicity at very low concentrations.

PFAS have become ubiquitous in the environment because of their prevalence and persistence and PFAS are also frequently detected in waste streams, including influents to municipal wastewater treatment plants (WWTPs). The concentrations of PFAS in influents to WWTPs are found to be higher in urbanized areas and in WWTPs that receive wastewater from significant industrial source(s) of PFAS.

The Madison Metropolitan Sewerage District (District) operates the Nine Springs WWTP, which provides wastewater treatment to over 380,000 people in a 184-square mile service area. The District retained TRC Environmental Corporation (TRC) to conduct PFAS sampling of its influent, effluent, polymers, biosolids, and struvite as part of an initial PFAS characterization. TRC and the District conducted the first phase of sampling in May and July 2021.

PFAS were expected to be detectable in the District's influent; however, because significant industrial sources of PFAS have not been identified in the District's service area, the influent PFAS concentrations were expected to be lower than in WWTPs that have significant industrial sources.

The results from the sampling completed as part of the District's initial characterization indicate PFAS are present in the WWTP influent, effluent, and biosolids at concentrations similar to those observed in other municipal WWTPs that service urbanized areas without significant industrial sources. Regulatory standards for PFAS in WWTP effluent or biosolids have not been established at the federal level or in Wisconsin at this time. Effluent sample results from the District indicate concentrations less than the WDNR's proposed surface water criteria published July 12, 2021.

1.0 Introduction

1.1 Background and Purpose

Per- and polyfluoroalkyl substances (PFAS) are a group of over 9,000 synthetic chemicals that have been manufactured since the 1940s and are used in a variety of industrial and commercial products and processes. PFAS have been used in aqueous film-forming foams (AFFF), metal plating, electronics, surfactants, textile and carpet treatments, coated papers, food packaging, cleaning products, personal care products, cookware, and many other applications. The same properties that make PFAS effective in industrial and consumer applications (e.g., non-reactive, stable, water and oil repellent, surfactant, and heat resistant) make PFAS persistent and ubiquitous in the environment. Recently, there has been a growing awareness and concern with the toxicity of certain PFAS compounds, their fate and transport in the environment, and potential for bioaccumulation.

Wastewater treatment plants (WWTPs) may receive PFAS from industrial or non-industrial sources and have the potential to discharge PFAS in their wastewater effluent and biosolids. The best solution currently available for reducing PFAS in WWTP discharge is source reduction because current PFAS treatment technologies are generally not feasible for municipal WWTPs. Some regulatory guidance for PFAS in environmental media exists at the state and/or federal level; however, regulatory standards for PFAS in WWTP effluent or biosolids have not been established at the federal level or in Wisconsin at this time.

The Madison Metropolitan Sewerage District (District) operates the Nine Springs WWTP, which provides wastewater collection and treatment for over 380,000 people, 19 significant industries, numerous commercial and smaller industrial operations, and several landfills in a 184-square mile service area. Significant industrial sources of PFAS have not been identified in the District's service area based on an internal review. A majority (approximately 99.77%) of the influent to Nine Springs WWTP enters through five force mains (pumping stations), and the remainder arrives as hauled waste. Wastewater received by the District proceeds through an advanced treatment process.

As part of the treatment process, three different polymers (referred to here as polymers 1, 2, and 3) are added to sludge to create biosolids. Effluents from the Nine Springs WWTP include liquid effluent, biosolids, and struvite. The majority of the liquid effluent is discharged to Badfish Creek with a smaller portion discharged to Badger Mill Creek. Struvite is an inorganic nutrient (magnesium ammonium phosphate) that is harvested from liquid filtrates from the treatment processes and sold as a slow-release fertilizer. The biosolids include Class A Cake, which can be used directly by farmers as fertilizer and soil conditioner, and Class B Liquid biosolids (Metrogro®), which is recycled to agricultural land in the fall and spring as fertilizer and soil conditioner. Refer to the PFAS Fate and Transport Report (TRC, 2020a) for a more detailed description of the Nine Springs WWTP treatment processes and a discussion of environmental cycling.

The District retained TRC Environmental Corporation (TRC) to conduct sampling for PFAS of its influent, effluent, polymers, biosolids, and struvite. TRC and the District conducted the first phase of PFAS sampling in May and July 2021. The purpose of this report is to summarize the findings of the initial phase of sampling in the context of PFAS results from other WWTPs, the current regulatory landscape, and the conceptual site model (CSM).

1.2 Relationship to Other Documents

The District previously retained TRC to develop a PFAS Sampling and Analysis Blueprint (SAB) (TRC, 2020b), PFAS Fate and Transport Report (TRC, 2020a), and CSM to support their PFAS action plan, all of which were completed in early 2020. TRC also prepared a standard operating procedure (SOP) for PFAS Sampling at MMSD Wastewater Treatment Facility (Appendix A).

2.0 Summary of Sampling and Analysis Program

This report describes results from two sampling events:

- May 2021: Phase 1 sampling of influent, effluent, biosolids, struvite, and polymers, conducted by TRC and the District
- July 2021: Re-sampling of Class B biosolids, conducted by the District

2.1 Sampling Methods

2.1.1 May 2021 Phase 1 Sampling

The Phase 1 Initial Characterization sampling was conducted at the District on May 6, 2021. Samples were collected from the five influent pumping stations, effluent, Class A cake biosolids, Class B Metrogro® biosolids, struvite, and polymers; four field duplicate samples and three field blanks were also collected. Additionally, an equipment blank was collected by the District on May 4, 2021, prior to the sampling, as described below. A photographic log of the sampling is provided in Appendix B.

Influent/Effluent

The influent and effluent samples were collected from the carboys used in the dedicated composite samplers, which collected composite samples on May 5, 2021 from 12 a.m. (midnight) until 11:59 p.m. The carboys used in the composite samplers were new and unused, to reduce the potential for cross-contamination, prior to the 24-hour collection period for the samples.

- The composite sampler carboys were opened by District staff at the end of the collection period (around 12 a.m. on May 6, 2021) to pour off a portion of the samples to be used for the routine laboratory analysis. The pour-offs were completed in the buildings where the composite samplers are located: the influent composite samplers are in the Headworks building and the effluent composite sampler is in the effluent building.
- After the pour-offs were completed, the composite sampler carboys were stored in a walk-in cooler in the Operations building until the PFAS samples were collected on the morning of May 6, 2021.
- The influent and effluent samples were collected in the walk-in cooler in the Operations building by inverting the carboys several times to mix their contents, then pouring directly into lab-provided sample bottles.
- Field duplicate samples were collected for Pumping Station 08 influent and the effluent sample.
- Field blanks were collected by pouring laboratory-provided PFAS-free water into empty sample bottles in three locations: in the Headworks and Effluent buildings (where the composite sampler carboys had been opened the night before for the pour-offs of sample material for routine laboratory analysis) and in the walk-in cooler during the influent and effluent sampling. Field blanks were collected on May 6, 2021.

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- An equipment blank was collected by the District on May 4, 2021 as a rinsate of an empty carboy prior to its use for collection of the effluent sample. The rinsate sample was collected by pouring PFAS-free water into the empty carboy and allowing it to contact the interior of the carboy before pouring the water into the lab-provided sample bottles in order to assess possible cross-contamination of the sample from the carboy.

Biosolids

The Class A cake biosolids sample was collected from the stockpile of Class A cake stored at the Nine Springs WWTP. The crust at the surface of the stockpile was scraped away with a shovel; samples to determine the percent moisture of the biosolids and its PFAS content were then collected by scooping biosolids directly from the pile into the lab container, using the lab container as a scoop. The sample for percent moisture was collected first; the sample for PFAS was then collected by scooping from the same area where the percent moisture sample was collected so that this sample was not in contact with the area scraped away with a shovel.

The Class B Metrogro® biosolids sample was collected at the end of the gravity belt directly into the lab containers. A field duplicate was collected for the Class B Metrogro® biosolids sample.

Struvite

The struvite samples were collected by scooping off-specification struvite stored in a sack. Off-specification struvite does not meet the District's grain size requirements for distribution, but otherwise meets requirements. The sample for PFAS analysis was collected from a few inches below the surface of the struvite, which was achieved by first scooping struvite from the surface with a different lab container prior to collecting the PFAS sample.

Polymers

The polymer samples (Polymers 1, 2, and 3) were collected directly from spigots coming off the polymer storage tanks. Prior to collecting the Polymer 2 sample, approximately 2 gallons of polymer were flushed from the spigot because it was known by District staff to not have been allowed to flow recently. A field duplicate was collected for the Polymer 3 sample.

Deviations from the SOP

A copy of the SOP for PFAS Sampling at MMSD Wastewater Treatment Facility is included in Appendix A. No significant deviations from the SOP were noted, with the following exceptions:

- The SOP states that the sample containers in the dedicated composite samplers should be evaluated to ensure that they are PFAS-free and should be replaced with PFAS-free containers if they are not. It also states certain materials including low-density polyethylene (LDPE) should not be in contact with samples unless known to be PFAS-free. The composite sampler carboys are made of LDPE. As stated previously, an equipment blank was collected as a rinsate sample of one of the carboys to assess the potential for contamination of the sample from the LDPE carboy.

- The SOP states that specific components of the dedicated composite samplers should be decontaminated or replaced prior to sampling in order to prevent potential contamination from the dedicated samplers, as follows: the strainer should be decontaminated or replaced between each sampling event and the suction line, distribution nozzle and sample bottle should be replaced between each sampling event. The composite sampler suction line tubing, strainers, and distribution nozzles were not decontaminated or replaced prior to PFAS sample collection. The suction line tubing used within the composite samplers was confirmed to be polyvinyl chloride (PVC) and silicone, which are approved materials for PFAS sampling.

Deviations from the SAB

Deviations from the initial characterization outlined in the SAB (TRC, 2020b) included the following:

- The SAB describes collecting the effluent sample from the effluent conveyance using a portable composite sampler. The effluent samples were instead collected from the dedicated composite sampler.
- Influent and effluent samples were collected from carboys stored in the walk-in cooler rather than in the Headworks building to ensure that they were refrigerated between the end of the composite sample collection period (midnight) and the time of PFAS sample collection.
- The SAB describes using trowels to collect samples of the Class A biosolids and struvite. These samples were instead collected directly into the laboratory containers to minimize potential cross-contamination from sampling equipment.
- The SAB describes subsampling by submerging the laboratory sample container in the container to be subsampled. Instead, subsampling of influent and effluent from the composite sampler carboys was performed by inverting the container to mix its contents and then pouring from the carboy into the laboratory sample containers.
- The SAB describes five possible equipment blanks for samples that may require sampling equipment (one each for influent, effluent, Class A cake, struvite, and polymer samples). Only one equipment blank was collected (from a composite sampler carboy). Sampling equipment was not needed for the biosolids, polymer, and struvite samples; therefore, equipment blanks were not collected for these samples.
- The resampling of the Class B biosolids in July 2021 resulted in an additional biosolids sample and duplicate sample outside the scope described in the SAB. Although the SAB specified one field blank for every day of sampling, an additional field blank was not collected during the July 2021 Class B biosolids resampling.
- The Polymer 1 sample was intentionally collected from a different spigot than specified in the photographic log (Appendix B) of the SAB because the planned spigot was known by District staff to be clogged.

Additionally, the following deviations from the sampling plan (not specified in the SAB) were noted:

- Field blanks for the influent and effluent carboy pour-offs were planned to be collected around the time that the composite sampler carboys were opened for the pour-offs around 12 a.m., but were instead collected on May 6, 2021 in the morning during the main Phase 1 sampling event.

2.1.2 July 2021 Class B Biosolids Re-sampling

The May 2021 Class B biosolids sample results had elevated detection limits due to a 10-times dilution applied by the lab, and PFAS were not detected above the elevated detection limits. The District re-sampled the Class B biosolids on July 19, 2021 so the biosolids could be analyzed using lower detection limits. The re-sampling included one biosolids sample and one field duplicate sample, both collected directly into the lab containers at the end of the gravity belt (as had been done during the May 2021 sampling).

2.2 WDNR PFAS Analytical List

The WDNR default PFAS analytical list for non-potable and solid matrices currently includes 33 individual PFAS compounds and will be referred to herein as the Wisconsin (WI) 33 PFAS list. This list was made effective by the WDNR on March 1, 2021.

The WI 33 PFAS list includes the following groupings of PFAS:

- 19 perfluoroalkyl acids (PFAAs), including 11 perfluorocarboxylic acids (PFCAs) and 8 perfluorosulfonic acids (PFSAs), which are terminal PFAS, meaning they do not transform;
- 3 fluorotelomer sulfonic acids (FTSs), which have the potential to undergo transformation to form other PFAS including PFCAs;
- 7 sulfonamides, sulfonamidoacetic acids, and sulfonamidoethanols, which have the potential to transform to other PFAS such as perfluorooctanesulfonic acid (PFOS); and
- 4 modern replacement chemicals such as GenX.

2.3 Laboratory Analysis

The influent, effluent, biosolids, and polymer samples were shipped under chain-of-custody to Eurofins|TestAmerica's lab in West Sacramento, California. Samples were analyzed for the WI 33 PFAS list using EPA Modified Method 537.1 following the WI Method Criteria established by the WDNR and certified under NR 149. In addition to analysis for PFAS, the influent and effluent samples were analyzed for total solids and total suspended solids, and the biosolids samples were analyzed for percent moisture/percent solids. The laboratory extracted the entire sample for influent and effluent samples and when high solid content was present in a sample that clogged the solid phase extraction cartridge, the laboratory rinsed the solids and included the rinsate in the extraction and subsequent analysis.

The three polymer samples were also analyzed for 21 PFAS using a total oxidizable precursor (TOP) assay by EPA Modified Method 537.1. The TOP assay subjects a sample to forced

oxidation using heat and strong oxidants, which can result in the transformation of precursor PFAS compounds to terminal PFAS products. The list of 21 PFAS, all of which are included in the WI 33 PFAS list, is determined by the lab's SOP. The TOP assay was only specified for the three polymer samples in the initial characterization described in the SAB.

3.0 Results

Analytical results are summarized in Tables 1-4. Bar graphs of the PFAS detections for influent, effluent, biosolids, and struvite samples are provided in Figures 1 and 2, and bar graphs of PFOA and PFOS detections are provided in Figures 3 and 4. Laboratory analytical reports are provided in Appendix C.

Comparisons of the analytical results from the District's samples to other studies and assessments of PFAS discussed in this section often include a sum or total value of PFAS. These aggregate PFAS values, including the aggregate PFAS values calculated for the District's results, are for comparative purposes only. Promulgated and proposed regulatory standards for each environmental media are for individual or several PFAS. None of the promulgated regulatory standards discussed in this section are for total analyzed PFAS.

3.1 Data Quality and Usability

A limited data validation was performed on the analytical data using the USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537 (EPA 910-R-18-001) (USEPA, 2018) and Wisconsin PFAS Aqueous (Non-Potable Water) and Non-Aqueous Matrices Method Expectations, Document ID EA-19-0001 (WDNR, 2019) as guidance for data review. EPA- 910-R-18-001 applies to EPA method 537 and drinking water matrices only but the guidance can be applied in part or in whole to evaluate data in non-drinking water matrices.

The data quality and usability review is documented in Appendix D. The data are usable for the purpose of this initial PFAS characterization report with the exception of the polymer TOP Assay PFAS analyses, which exhibited poor recoveries of isotope dilution surrogates. Based on the data quality review, some of the laboratory results have been qualified as estimated values (J) or estimated non-detects (UJ), as described in Appendix D. These data validation qualifiers are shown in Tables 1-4, which also include some of the qualifiers that were assigned by the laboratory. Some of the qualifiers assigned by the laboratory, as shown in the laboratory analytical reports in Appendix C, were determined not to be applicable based on the data validation and are not included in Tables 1-4. Note, J qualifiers assigned by the laboratory are for estimated results that are between the reporting limit and the method detection limit, whereas J qualifiers assigned based on the limited data validation are for estimated results due to sample and quality control results not meeting certain criteria. Numerical results discussed throughout this report include the J qualifier, when assigned.

The lab report flagged re-extracted polymer sample data as out of holding time, however, the WI PFAS method criteria designates hold times for aqueous and solid samples as 28 days to extract and 30 days to analyze and the re-extractions occurred within this hold time.

3.2 Influent

Influent sample results from the five pumping stations are presented in Table 1 and on Figures 1 and 3. Influent results are reported in nanograms per liter (ng/L), which are equivalent to parts per trillion (ppt). The influent samples were named based on their corresponding pump station number (i.e., the sample from Pump Station 11 is named Influent-11). The PFAS detected in influent samples generally consist of PFCAs and PFSAs, with smaller amounts of other PFAS.

One replacement chemical, 4,8-dioxa-3H-perfluorononanoic acid (trade name ADONA), was detected in samples from two influent stations. The sum of PFAS detected in influent samples from individual pumping stations ranged from approximately 23 ng/L in Influent-11 to 191 ng/L in the Influent-08 duplicate sample, where the majority of PFAS detected was perfluoropentanoic acid (PFPeA).

To estimate PFAS concentrations resulting from the combination of influent from all five pumping stations, combined influent concentrations were calculated as weighted averages based on the respective flow rates of the pumping stations as specified in the PFAS SAB. Non-detected results were represented by concentrations of zero for the purpose of the calculation. The combined influent concentrations resulting from this calculation are shown in Table 4 and presented graphically in Figure 1. The sum of PFAS for the calculated combined influent is approximately 84 ng/L. The PFAS compound with the highest calculated concentration in the combined influent is PFPeA (approximately 33 ng/L); other individual PFAS concentrations were calculated at levels less than 10 ng/L, including perfluorooctanoic acid (PFOA) (5.13 ng/L) and PFOS (6.86 ng/L). When weighted by flow rate, the individual pumping station samples contributed the following portions of the sum of PFAS in the calculated combined influent, rounded to the nearest percent:

- Influent-08: 40%
- Influent-18: 32%
- Influent-07: 16%
- Influent-11: 7%
- Influent-02: 6%

3.2.1 Comparison to Influent from Other WWTPs

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) conducted a statewide assessment of PFAS in 42 WWTPs, which included the 20 largest WWTPs and 22 other WWTPs selected to represent different flow rates and treatment processes (EGLE, 2021a). Of the 42 WWTPs studied, 35 were part of the Industrial Pretreatment Program (IPP). For EGLE's evaluation, samples of influent, effluent, and biosolids were analyzed for a list of 24 PFAS, all of which are included in the WI 33 list. This data set is considered one of the best points of reference available for comparison to the District's WWTP results and is referred to throughout this report.

Results from Michigan's statewide WWTP survey indicated influent results for the sum of 24 PFAS ranging from 5 ng/L to 8,667 ng/L (including detected results only), with a median of 52 ng/L and an average of 361 ng/L. The sum of the same 24 PFAS detected in the District's calculated combined influent is approximately 78 ng/L, between the median and average concentrations detected in Michigan. The District's combined influent concentrations for PFOA (5.13 ng/L) and PFOS (6.86 ng/L) are similar to the median concentrations from the Michigan influent results for PFOA (4.6 ng/L) and PFOS (7.5 ng/L) based on data including non-detect results represented by the detection limit.

In a study of 19 municipal WWTPs in Australia, the mean concentration of 21 PFAS in the influent was 110 parts per trillion (ppt, equivalent to ng/L), and the mean concentrations of the individual

compounds PFOA and PFOS were 19 ppt and 15 ppt, respectively (Coggan et al., 2019). In contrast, concentrations of PFOA and PFOS greater than 1,000 ppt were found in industrial wastewater (Hamid et al., 2016). the District's combined influent concentrations of PFOA and PFOS (5.13 ppt and 6.86 ppt, respectively) are lower than the mean concentrations from the municipal WWTPs in Australia (19 ppt and 15 ppt, respectively), and several orders of magnitude lower than the concentrations in the WWTP that accepted wastewater from a major PFAS industry.

3.3 Effluent

Effluent sample results are provided in Table 1 and shown on Figures 1 and 3. Effluent results are reported in ng/L, which are equivalent to ppt. By concentration, the PFAS detected in effluent samples consists mostly of terminal PFAS (approximately 80% PFCAs and 15%-20% PFSAs, by concentration), with only a few detections of other PFAS. Perfluorooctanesulfonamide (FOSA) was detected in the duplicate sample but not the primary sample. N-methylperfluorooctanesulfonamido acetic acid (NMeFOSAA) was detected at estimated concentrations <2 ng/L in both effluent samples.

The following PFAS compounds were detected at the highest concentrations in effluent samples:

- Perfluorohexanoic acid (PFHxA): 24 ng/L
- PFPeA: 17 ng/L (duplicate)
- Perfluorobutanoic acid (PFBA): 11 ng/L (duplicate)
- PFOA: 11 ng/L (duplicate)

Effluent results indicate PFOA concentrations ranging from 9.7 ng/L to 11 ng/L, and PFOS concentrations of 3.7 ng/L.

3.3.1 Comparison to Surface Water Standards

The WDNR published draft proposed surface water standards for PFOA and PFOS on July 12, 2021. These proposed standards are narrative criteria that contain the following numeric thresholds:

- PFOA: 20 ng/L in waters classified as public water supplies under Wisconsin Administrative Code ch. NR 104, and 95 ng/L for other surface waters.
- PFOS: 8 ng/L for all waters except those that cannot naturally support fish and do not have downstream waters that support fish.

The WDNR's proposed numeric thresholds for PFOS and PFOA are intended to be compared directly to effluent concentrations for the purpose of determining whether a discharger would need to implement a PFAS Minimization Plan. The concentrations of PFOA and PFOS in the District's effluent samples are less than the WDNR's proposed numeric surface water thresholds.

States that have promulgated statewide standards or values considered final guidance for PFAS in surface water include Alaska, Colorado, Michigan, and Minnesota (ITRC, 2021a, Table 5). It

should be noted that in general, some surface water standards are meant to be applied directly to effluent and some are not. Some of the surface water criteria are specifically for surface water used for drinking water or for surface water that has the potential to affect a drinking water supply. Most of these states have surface water criteria for PFOA and/or PFOS. Colorado's translation levels are also established for perfluorononanoic acid (PFNA); perfluorobutanesulfonic acid (PFBS); perfluorohexanesulfonic acid (PFHxS); and for the sum of PFOS, PFOA, perfluorononanoic acid (PFNA), and select precursors (referred to as parent constituents). Oregon has established initiation levels for municipal wastewater effluent, which are used to determine whether a wastewater facility must develop a pollution prevention plan (Table 5). The PFAS concentrations in the District's effluent samples are lower than the most stringent surface water or effluent criteria from these other states.

3.3.2 Comparison to Effluent from Other WWTPs

Effluent results from Michigan's statewide WWTP survey indicated a median concentration of 107 ng/L for the sum of 24 PFAS based on an evaluation of all effluent samples included in Table 18 of Michigan's report (EGLE, 2021a). The sum of the same 24 PFAS in the District's effluent samples ranged from approximately 81 to 82 ng/L. Based on the box plot of effluent PFAS detections from Michigan's statewide WWTP survey (EGLE, 2021a), the PFOA results from the District's effluent (9.7 to 11 ng/L) are similar to Michigan's mean and median detected PFOA concentrations, and the PFOS results from the District's effluent (3.7 ng/L) are lower than the mean or median detected PFOS results from Michigan. Note, the box plots show mean and median values graphically, but do not specify numerical values.

A study of eight WWTPs discharging to San Francisco Bay, including seven municipal WWTPs and one airport industrial treatment plant, found two of the WWTPs accepted wastewater from locations with significant AFFF sources and six WWTPs that did not have significant AFFF sources (Houtz et al., 2016). As stated in the background section, PFAS have been used in AFFF. The PFOA and PFOS concentrations in the District's effluent are lower than the median concentrations of PFOA (23 ng/L) and PFOS (15 ng/L) from the six municipal WWTPs that did not have significant AFFF sources. The PFOS concentrations in effluent from the two facilities with significant AFFF sources were 420 ng/L (municipal WWTP) and 560 ng/L (airport industrial treatment plant), more than 100 times higher than the concentrations in District effluent samples (3.7 ng/L PFOS).

3.3.3 Comparison to WDNR Surface Water Sample Results

The WDNR collected surface water samples from Badfish Creek and other targeted monitoring locations in 2021, and the sample results for PFOS and PFOA are available online (WDNR, 2021). WDNR's stated objectives of the sampling are to 1) describe PFAS concentrations in main exposure routes at sites with known or suspected contamination, 2) characterize background conditions in major water bodies, and 3) aid in the development of a water quality standard.

Effluent from the District is discharged into Badfish Creek, which flows into the Lower Yahara River downstream of the Madison lakes. The WDNR sampling included two locations along Badfish Creek, both downstream from where District effluent discharges into the creek: one at Schneider Road and one at Casey Road (farther downstream, near the confluence with the Yahara River). PFOA and PFOS were detected at lower concentrations in these surface water samples than were detected in the District effluent samples. PFOA was detected in Badfish Creek

surface water at concentrations ranging from 3.71 to 5.82 ng/L, and PFOS was detected at concentrations ranging from 0.701 to 2.26 ng/L.

3.4 Polymers

Polymer sample results are summarized in Table 3. Polymer results are reported in micrograms per kilogram (ug/kg), which are equivalent to parts per billion (ppb). As stated in Section 3.1, the TOP assay results are not usable due to laboratory data quality issues. Therefore, only the results of the polymer analyses for the WI 33 PFAS list are used for the purpose of this evaluation. The results indicate very low-level estimated concentrations less than 1 ug/kg of PFBA in Polymer 3, PFOS in the duplicate sample for Polymer 3, and no other detections of PFAS.

3.5 Biosolids

Biosolids sample results are summarized in Table 2 and shown in Figures 2 and 4. Biosolids results are reported on a dry weight basis, meaning that the results represent a concentration that has been corrected for moisture content. The biosolids results are reported in ug/kg, which is equivalent to ppb.

3.5.1 Class A

The Class A biosolids sample results indicate qualified detections of PFAS, including PFCAs ranging from C4 to C12, PFOS, perfluorodecanesulfonic acid (PFDS), NMeFOSAA, N-ethylperfluorooctanesulfonamido acetic acid (NEtFOSAA), and N-methylperfluorooctanesulfonamido ethanol (NMeFOSE). Replacement chemicals were not detected in Class A biosolids. The following PFAS compounds were detected at the highest concentrations in the Class A biosolids sample:

- NMeFOSAA: 41 J ug/kg
- PFHxA: 29 J ug/kg
- PFOS: 19 J ug/kg

3.5.2 Class B

The Class B biosolids were sampled in May 2021 as part of the initial characterization sampling and were resampled in July 2021, as explained in Section 2.1.3. The May 2021 Class B biosolids sample results had elevated detection limits due to a 10-times dilution applied by the lab, and PFAS were not detected above the elevated detection limits. The July 2021 biosolids samples were analyzed by the lab with no dilution, resulting in lower detection limits and the expected detection of several PFAS. As such, this report will focus on the July 2021 sample results as the non-detected PFAS results of the May 2021 sample are assumed to result from the elevated detection limits. PFAS detected in Class B biosolids samples include PFCAs, PFSAs, 8:2 FTS, FOSA, NMeFOSAA, NEtFOSAA, NMeFOSE, and NNetFOSE. Replacement chemicals were not detected in Class B biosolids. The following PFAS compounds were detected at the highest concentrations in the Class B biosolids sample or duplicate sample:

- NMeFOSAA: 16 ug/kg

-
- NMeFOSE: 12 ug/kg
 - PFOS: 10 ug/kg

3.5.3 Comparison to Biosolids Standards

The Class A and B biosolids are land-applied as soil amendments. The WDNR has not established PFAS standards for land application of biosolids in Wisconsin. States that have developed criteria for PFAS in biosolids include Michigan and Maine (Table 6). The EPA is currently conducting a risk assessment for PFOA and PFOS in biosolids, and because Wisconsin is federally delegated to administer the EPA biosolids program, Wisconsin is expected to adopt standards that are at least as stringent as any standards that are established by EPA under the Clean Water Act.

Michigan's Interim Strategy for Land Application of Biosolids Containing PFAS (EGLE, 2021b), uses a tiered approach based on PFOS concentrations in biosolids samples. The proposed action levels in this guidance are not risk-based, but rather are based on a statistical review of data from PFAS sampling conducted at WWTPs in Michigan. The interim guidance specifies thresholds for which biosolids cannot be land applied (150 ug/kg), for which land application should be limited to 1.5 tons per acre, or approximately half the average rate (50 ug/kg), and for which investigation of sources and sampling of effluent is recommended but land application is not restricted (20 ug/kg). The PFOS concentrations detected in the District's biosolids samples for Class A (19 J ug/kg) and Class B (8.0 to 10 ug/kg) are less than the 50 ug/kg threshold for limited land application rates and also slightly less than the 20 ug/kg threshold for suggested source investigation and effluent sampling.

The Maine Department of Environmental Protection (DEP) has established screening levels for beneficial use of solid wastes for PFOS (5.2 ug/kg), PFOA (2.5 ug/kg) and PFBS (1,900 ug/kg), which are based on the leaching to groundwater pathway (Maine DEP, 2018). The District's Class A and B biosolids PFOS results exceed Maine's screening levels for PFOS, and the Class A biosolids PFOA results (16 ug/kg) exceed Maine's screening level for PFOA. PFBS was not detected in the Class A or B biosolids.

3.5.4 Comparison to Biosolids from Other WWTPs

In general, the biosolids sample results are similar to those found in studies of other municipal WWTPs that do not accept industrial wastewater from major PFAS sources. For example, PFOS was detected at concentrations of 8 to 10 ug/kg in the District's Class B biosolids and at a concentration of 19 ug/kg in the Class A biosolids. At a WWTP in Decatur, Alabama that accepted wastewater from a PFAS manufacturer, the biosolids had PFOS concentrations up to 400 ug/kg; whereas, biosolids from a municipal WWTP in New York City had PFOS concentrations between 30 and 80 ug/kg (NEBRA, 2017). The New York WWTP levels are in line with other studies which found PFOS levels around 25 ug/kg in municipal WWTPs' biosolids (NGWA, 2017).

The Michigan study of 42 municipal WWTPs reported PFOS detected in 43 of 45 final treated solids (sludge or biosolids) samples, most of which had detection limits around 1 ug/kg (EGLE, 2021a). The study found a median concentration of 13 ug/kg and an average concentration of 184 ug/kg. For the WWTPs deemed to not be "industrially impacted" (based on having PFOS concentrations less than 150 ug/kg), the average PFOS concentration was 18 ug/kg and the

median concentration was 11 ug/kg. These results are similar to the PFOS concentrations in Class A (19 J ug/kg) and Class B (8 to 10 ug/kg) biosolids samples from the District. The Michigan study found PFOA detected in 60% of WWTP biosolids samples, with concentrations up to approximately 25 ug/kg. The PFOA results from District biosolids samples are within this range.

The Michigan study also included a summary of PFOS concentrations in biosolids from published literature from other locations, including Switzerland, Kenya, Australia, and the United States. Based on the box plots presented in the EGLE (2021a) report, the concentrations of PFOS in biosolids samples from the District are lower than the 25th percentile of PFOS concentrations from the other biosolids studies conducted in Switzerland, Australia, and the U.S., and are higher than the concentrations from a study conducted in Kenya, where a smaller fraction of the WWTPs sampled receive industrial discharge (EGLE, 2021a).

3.5.5 Comparison to Biosolids-Based Fertilizers

Lazcano et al. (2020) analyzed samples of 13 commercially available biosolid-based products. Samples were analyzed for 17 PFAAs, 15 of which are included in the WI 33 list. (The two PFAAs analyzed in the study that are not included in the WI 33 PFAS list are PFHxDA and PFODA). The study results indicated a range of total PFAAs in biosolid-based products from 9 ug/kg to 199 ug/kg based on the 17 PFAAs analyzed. The sums of PFAS detected in the District's individual Class A and B biosolids sample results fall within this range whether the sum includes only the 15 PFAAs that overlap with the Lazcano 17 PFAA list (27 to 105 ug/kg) or all 33 PFAS in the WI list (64 to 170 ug/kg).

Sierra Club published a report on PFAS results from nine commercially available biosolids-based fertilizers (Sierra Club, 2021). Note, the Sierra Club report was not peer-reviewed or published in a scientific journal. The commercial products analyzed as part of their study were all derived from Class A biosolids and included Milorganite 6-4-0 from Milwaukee, Wisconsin. Samples were analyzed for the compounds included in the WI 33 PFAS list. The study reported concentration ranges for total PFAS (38 to 223 ug/kg), PFOA (0.67 to 23.8 ug/kg), and PFOS (3.71 to 22.1 ug/kg). Results from the District's Class A biosolids sample fall within the ranges from this study, as follows: sum of detected PFAS (170 ug/kg), PFOA (16 ug/kg), and PFOS (19 J ug/kg).

3.6 Struvite

Struvite results are provided in Table 2 and shown on Figures 2 and 4. Results indicate PFHxA detected at an estimated concentration of 0.067 J ug/kg while the other PFAS in the WI 33 PFAS list were not detected in the struvite sample.

4.0 Discussion of Conceptual Site Model

4.1 Influent Results and Possible Sources

The distribution and concentrations of PFAS detected in the District's influent are generally similar to results from other municipal WWTPs in urbanized areas without significant industrial sources. Potential sources of PFAS in the Nine Springs WWTP influent sanitary sewer lines may include sanitary waste from households and businesses; occasional AFFF use (e.g., fire suppression systems); landfill leachate; permitted industrial dischargers; other industrial and commercial users; municipal wastewater residual sludges trapped in the sanitary sewer infrastructure; and PFAS-impacted groundwater or surface water (e.g., inflow and infiltration, temporary construction dewatering, or disposal of remediation groundwater). Hauled wastes are received separately via individual truckloads, and therefore would not be represented in the influent samples from the pumping stations. Hauled waste comprises less than one percent of the total amount of wastewater treated at the Nine Springs WWTP.

The PFAS compounds with the highest concentrations in the combined influent include PFPeA, PFBA, PFHxA, PFOA, PFHxS, and PFOS. PFPeA was detected at a higher concentration in one influent line (Influent-08) relative to other PFAS in the influent. PFPeA is widely used and present in clothing and leather coatings, cosmetics, floor coverings, carpet treatment chemicals, nonstick food wrappers, textiles, upholstery, and other products (Glüge, 2020) and is a potential breakdown product of fluorotelomers, including modern fluorotelomer AFFFs referred to as "C6 foams" (ITRC, 2021b). Other PFAS detected in the influent are also present in several industrial and commercial products and AFFF. PFOA and PFOS were phased out of production in the United States but still may be present in existing stocks of materials, such as PFOS-based AFFF, and also may be produced in other countries and imported to the United States.

The presence of NMeFOSAA and NEtFOSAA and their ethanol precursors NMeFOSE and NEtFOSE may be associated with surface protection products or surfactants (i.e., detergents) (Buck, 2011). The ethanol precursors are some of the raw materials for surfactant and surface protection products, including coated papers. Although NMeFOSAA, NEtFOSAA and their ethanol precursors added up to only about 7% of the detected PFAS in the combined influent, they comprised about 38%-55% of detected PFAS in the biosolids samples, and NMeFOSE was detected in influent from all five pumping stations. The paper coating industry also uses a wide range of NEtFOSE-based phosphate ester surfactants that are not on the WI 33 PFAS list (Trier, 2017), but which may be precursors for these and other PFAS compounds.

4.2 Transformation and Partitioning

Influent and effluent sample results may be compared to assess potential transformation and/or partitioning of PFAS within the WWTP. A comparison of influent and effluent results is provided in Table 4. These results are from influent and effluent samples collected on the same day and do not represent the same material before and after treatment due to hydraulic retention time. However, they are used here for the purpose of general comparison.

Some studies at other WWTPs have generally found that the concentrations of PFAS detected in the effluent are higher than in the influent. The higher concentrations in effluent have been found in numerous studies worldwide and have been attributed to transformation of precursors within the WWTP processes, which results in PFAS that are detectable by available laboratory methods

(Gallen et al., 2018). It should be noted that any sums of detected PFAS will be dependent on the compounds included in the analytical list and the laboratory detection limits. District samples were analyzed for a combination of PFAAs and precursors. The results from the District's influent and effluent samples indicate that the sum of detected PFAS in the effluent sample (81.45 ng/L) is similar to the sum of detected PFAS in the calculated combined influent (83.96 ng/L).

The District's results indicate that some PFAS compounds were detected at higher concentrations in the influent, and some were detected at higher concentrations in the effluent (Table 4). For example, PFOA was detected at a higher concentration in the effluent (9.7 ng/L) than in the combined influent (5.1 ng/L), whereas PFOS was detected at a lower concentration in the effluent (3.7 ng/L) than in the combined influent (6.9 ng/L). These differences in concentrations could result from transformation of PFAS during treatment and/or partitioning between solids and liquids or air. Differences could also result from variation in influent concentrations over time because the samples do not represent the exact same material before and after treatment. Most of the PFCAs that were detected were found at higher concentrations in the effluent than in the influent, which could be due to transformation from precursors or partitioning between liquid and solid. In general, short-chain PFAS generally prefer the aqueous phase and long-chain PFAS generally adsorb and partition to organic carbon in the solid phase.

The biosolids samples generally contain higher proportions of longer chain/larger molecule PFAS compared to the effluent samples, consistent with the expectation for partitioning of longer chain PFAS to solids based on greater sorption potential for these compounds. Relative to the effluent results, the biosolids results have especially high proportions of perfluorooctanesulfonamido acetic acids and perfluorooctanesulfonamido ethanols, which are large molecules that include fully fluorinated C8 tails.

The Class A cake biosolids sample generally had higher concentrations of PFAS than the Class B biosolids samples. The Class A cake also has a higher proportion of PFAAs and a higher ratio of breakdown product NMeFOSAA relative to its precursor NMeFOSE. One possible contributing factor for these differences is that the Class A cake undergoes additional thermophilic digestion separately from the Class B biosolids, which may result in additional breakdown of precursors.

For additional context, refer to the PFAS Fate and Transport Report (TRC, 2020a) for discussion of PFAS transformation and partitioning.

5.0 Conclusions

PFAS were detected in influent, effluent, and biosolids at concentrations similar to those found in other municipal WWTPs that do not receive industrial wastewater from major PFAS sources. The magnitude and distribution of PFAS concentrations in influent samples varied between the District's five influent pumping stations. Effluent sample results indicate concentrations less than the WDNR's proposed surface water criteria.

Polymer sample results indicate low, estimated concentrations of two PFAS in Polymer 3 or its duplicate sample.

Struvite sample results indicated only one PFAS detected at a low, estimated concentration.

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Table 1: Influent, Effluent, and Blank Results

Madison Metropolitan Sewerage District

Madison, Dane County, Wisconsin

TRC Project #390131.0001.0000

Sample Location ID/Type			INFLUENT-02	INFLUENT-07	INFLUENT-08		INFLUENT-11	INFLUENT-18	EFFLUENT-PERM		BLANKS			
Sample ID			INFLUENT-02-20210506	INFLUENT-07-20210506	INFLUENT-08-20210506	DUP01-20210506	INFLUENT-11-20210506	INFLUENT-18-20210506	EFFLUENT-PERM-20210506	DUP02-20210506	EB01-20210504	FB01-20210506	FB02-20210506	FB03-20210506
Sample Date			5/6/2021	5/6/2021	5/6/2021	5/6/2021	5/6/2021	5/6/2021	5/6/2021	5/4/2021	5/6/2021	5/6/2021	5/6/2021	5/6/2021
Analyte	CAS RN	Units												
Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	375-22-4	ng/L	4.6	21	5.8	5.1	3.3 J	10	10	11	<2.2	<2.1	<2.2	<2.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/L	3.7	15	160	170 J	<0.42	5.6	15	17	<0.45	<0.43	<0.45	<0.43
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	4.6	30	5.2	4.9 I	4.1	8.1	24	22	<0.53	<0.51	<0.53	<0.50
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.3 J	4.8	1.1 J	1.1 J	0.82 J	2.3	3.5	3.8	<0.23	<0.22	<0.23	<0.22
Perfluoroctanoic acid (PFOA)	335-67-1	ng/L	3.3	11	2.2	2.5	2.2	7.8	9.7	11	<0.78	<0.75	<0.78	<0.74
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	0.66 J	1.3 J	0.52 J	<0.23	0.72 J	0.93 J I	0.81 J	0.71 J	<0.25	<0.24	<0.25	<0.23
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	<0.25	1.1 J	0.48 J	<0.26	0.54 J	1.2 J	1.4 J	1.5 J	<0.28	<0.27	<0.29	<0.27
Perfluoroundecanoic acid (PFUnA)	2058-94-8	ng/L	<0.89	<0.93	<0.93	<0.92	<0.95	<0.90	<0.96	<1.0	<1.0	<0.97	<1.0	<0.96
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	<0.45 UJ	<0.46 UJ	<0.47 UJ	<0.46 UJ	<0.48 UJ	<0.45 UJ	<0.48	<0.51	<0.50	<0.48	<0.51	<0.48
Perfluorotridecanoic acid (PFTriA)	72629-94-8	ng/L	<1.1	<1.1 UJ	<1.1	<1.1 UJ	<1.1 UJ	<1.1	<1.1	<1.2	<1.2	<1.1	<1.2	<1.1
Perfluorotetradecanoic acid (PFTeA)	376-06-7	ng/L	<0.59	<0.61 UJ	<0.62	<0.61 UJ	<0.63 UJ	<0.60	<0.64	<0.67	<0.64	<0.67	<0.64	<0.63
Sulfonic Acids														
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ng/L	1.8 I	5.8	1.6 J	<0.17	1.2 J	4.0	3.9 J	<0.18 UJ	<0.18	<0.18	<0.18	<0.17
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	ng/L	<0.24	<0.25	<0.25	0.28 J	<0.26	1.6	0.54 J	0.91 J	<0.27	<0.26	<0.28	<0.26
Perfluorohexanesulfonic acid (PFhXS)	355-46-4	ng/L	4.9 I	7.6	3.3 I	2.1 I	2.7 I	15	7.5	7.0	<0.52	<0.50	<0.53	<0.50
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	ng/L	<0.15	<0.16	<0.16	<0.16	<0.16	0.35 J	<0.17	<0.18	<0.17	<0.17	<0.18	<0.17
Perfluoroctanesulfonic acid (PFOS)	1763-23-1	ng/L	6.9 I	6.2 I	2.6 I	2.3	3.5 I	12	3.7	3.7	<0.49	<0.47	<0.50	<0.47
Perfluoronanesulfonic acid (PFNS)	68259-12-1	ng/L	<0.30	<0.31	0.58 J I	<0.31	<0.32	<0.30	<0.32	<0.34	<0.34	<0.33	<0.34	<0.32
Perfluorodecanesulfonic acid (PFDS)	335-77-3	ng/L	<0.26	<0.27	<0.27	<0.27	<0.28	<0.26	<0.28	<0.29	<0.29	<0.28	<0.29	<0.28
Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	ng/L	<0.79	<0.82	<0.82	<0.81	<0.84	<0.80	<0.85	<0.89	<0.89	<0.85	<0.89	<0.84
4:2 FTS	757124-72-4	ng/L	<0.19	<0.20	<0.20	<0.20	<0.21	<0.20	<0.21	<0.22	<0.22	<0.22	<0.21	<0.21
6:2 FTS	27619-97-2	ng/L	<2.0	<2.1	<2.1	2.8 J	<2.2	3.8 J	<2.2	<2.3	<2.3	<2.2	<2.3	<2.2
8:2 FTS	39108-34-4	ng/L	<0.37	<0.39	<0.39	<0.39	<0.40	0.46 J I	<0.40	<0.42	<0.42	<0.40	<0.42	<0.40
Sulfonamides, Sulfomidoacetic acids, Sulfonamidoethanols														
Perfluoroctanesulfonamide (FOSA)	754-91-6	ng/L	<0.79	<0.82	<0.83	<0.82	<0.85	<0.81	<0.86	2.1	<0.90	<0.86	<0.90	<0.85
NMeFOSA	31506-32-8	ng/L	<0.35	<0.36	<0.36	<0.36	<0.37	<0.35	<0.38	<0.40	<0.39	<0.38	<0.40	<0.37
NEtFOSA	4151-50-2	ng/L	<0.71	1.6 J	<0.74	<0.73	<0.75	<0.71	<0.76	<0.80	<0.80	<0.76	<0.80	<0.76
NMeFOSAA	2355-31-9	ng/L	<0.97	4.6	<1.0	<1.0 UJ	<1.0 UJ	<0.99	1.4 J	1.3 J	<1.1	<1.1	<1.1	<1.0
NEtFOSAA	2991-50-6	ng/L	<1.1 UJ	2.3 J	<1.1 UJ	<1.1 UJ	<1.1 UJ	1.3 J	<1.1	<1.2	<1.2	<1.1	<1.2	<1.1
NMeFOSE	24448-09-7	ng/L	1.3 J	4.7	2.4 J	<1.2	4.4	2.9 J	<1.2	<1.3	<1.3	<1.2	<1.3	<1.2
NEtFOSE	1691-99-2	ng/L	<0.69	1.0 J	<0.72	<0.71	<0.74	3.7	<0.75	<0.78	<0.78	<0.75	<0.78	<0.74
Replacement Chemicals														
HFPO-DA (GenX) ⁽¹⁾	13252-13-6	ng/L	<1.2	<1.3	<1.3	<1.3	<1.3	<1.2	<1.3	<1.4	<1.4	<1.3	<1.4	<1.3
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	ng/L	1.2 J I	<0.34	<0.34	<0.33	<0.35	3.2 I	<0.35	<0.37	<0.37	<0.35	<0.37	<0.35
F-53B Major	756426-58-1	ng/L	<0.19	<0.20	<0.20	<0.20	<0.21	<0.20	<0.21	<0.22	<0.22	<0.21	<0.22	<0.21
F-53B Minor	763051-92-9	ng/L	<0.26	<0.27	<0.27	<0.27	<0.28	<0.26	<0.28	<0.29	<0.29	<0.28	<0.29	<0.28
Solids														
Total Solids	-	mg/L	1200	1400	1400	--	1300	1500	1200	--	--	--	--	--
Total Suspended Solids	-	mg/L	190	220	170	--	230	250	6.5	--	--	--	--	--
Sum of Detected PFAS														
Sum of Detected PFAS	-	ng/l	34.3	118.0	185.8	191.1	23.5	84.2	81.5	82.0	ND	ND	ND	ND

Notes

- ≡ Value not applicable

-- = Not analyzed

CAS RN = Chemical Abstracts Service Registry Number

ng/L = nanograms per liter (equivalent to parts per trillion [ppt])

mg/L = milligrams per liter (equivalent to parts per million [ppm])

< = Result not detected above laboratory method detection limit (MDL), reported as <MDL

ND = Not detected

Data Qualifiers

| = Estimated value

UJ = Estimated nondetect

| = Value is EMPC (estimated maximum possible concentration).

Blank Samples

EB01-20210504 - equipment blank collected as rinsate of effluent composite sampler carboy

EB01-20210506 - field blank collected in Operations building walk-in cooler

EB02-20210506 - field blank collected in Headworks building

EB03-20210506 - field blank collected in Effluent building

Footnotes

⁽¹⁾ GenX is a trade name for hexafluoropropylene oxide dimer acid (HFPO-DA).

Revised by: J. Auper 9/27/2021

Checked by: M. Ursin 9/27/2021

Table 2: Biosolids and Struvite Results
Madison Metropolitan Sewerage District
Madison, Dane County, Wisconsin
TRC Project #390131.0001.0000

Sample Location ID		BIOSOLIDS-A		BIOSOLIDS-B			STRUHITE		
Sample ID		BIOSOLIDS-A-20210506	BIOSOLIDS-B-20210506	DUP03-20210506	Class B Biosolids	Class B Biosolids Dup	STRUHITE-20210506		
Analyte		CAS RN	Units	5/6/2021	5/6/2021	5/6/2021	7/19/2021	7/19/2021	5/6/2021
Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	ug/kg	3.4 J	<4.7	<4.5	<0.74	<0.88	<0.027	
Perfluoropentanoic acid (PFPeA)	2706-90-3	ug/kg	11 J	<13	<12	<0.66	<0.79	<0.073	
Perfluorohexanoic acid (PFHxA)	307-24-4	ug/kg	29 J	<7.0	<6.8	3.2 I	3.8 I	0.067 J	
Perfluoroheptanoic acid (PFHpA)	375-85-9	ug/kg	<0.96	<4.8	<4.7	<0.61	<0.73	<0.028	
Perfluorooctanoic acid (PFOA)	335-67-1	ug/kg	16 J	<14	<14	1.2 J	1.6 J	<0.082	
Perfluorononanoic acid (PFNA)	375-95-1	ug/kg	1.3 J I	<6.0	<5.8	0.60 J	0.65 J	<0.034	
Perfluorodecanoic acid (PFDA)	335-76-2	ug/kg	15 J	<3.7	<3.5	4.9	5.7	<0.021	
Perfluoroundecanoic acid (PFUnA)	2058-94-8	ug/kg	<1.2	<6.0	<5.8	1.2 J	1.2 J	<0.034	
Perfluorododecanoic acid (PFDa)	307-55-1	ug/kg	5.4 J	<11	<11	2.6 J	3.0 J	<0.064	
Perfluorotridecanoic acid (PFTriA)	72629-94-8	ug/kg	<1.7	<8.5	<8.2	<0.34 UJ	<0.40	<0.048	
Perfluorotetradecanoic acid (PFTeA)	376-06-7	ug/kg	<1.8	<9.0	<8.7	1.0 J	0.85 J	<0.051	
Sulfonic Acids									
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ug/kg	<0.83	<4.2	<4.0	<0.61	<0.73	<0.024	
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	ug/kg	<0.66	<3.3	<3.2	<0.60	<0.71	<0.019	
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ug/kg	<1.0	<5.2	<5.0	2.0 J	2.4 J	<0.029	
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	ug/kg	<1.2	<5.9	<5.6	<0.79	<0.94	<0.033	
Perfluoroctanesulfonic acid (PFOS)	1763-23-1	ug/kg	19 J	<33	<32	8.0 I	10 I	<0.19	
Perfluorononanesulfonic acid (PFNS)	68259-12-1	ug/kg	<0.66	<3.3	<3.2	<0.47	<0.56	<0.019	
Perfluorodecanesulfonic acid (PFDS)	335-77-3	ug/kg	4.6 J	<6.5	<6.3	2.4 J	2.0 J	<0.037	
Perfluorododecanesulfonic acid (PFDsO)	79780-39-5	ug/kg	<2.0	<10	<9.6	<0.76 UJ	<0.90	<0.057	
4:2 FTS	757124-72-4	ug/kg	<12 UJ	<62	<59	<0.82	<0.98	<0.35	
6:2 FTS	27619-97-2	ug/kg	<5.0	<25	<24	<0.43	<0.52	<0.14	
8:2 FTS	39108-34-4	ug/kg	<8.3	<42	<40	0.60 J	0.67 J	<0.24	
Sulfonamides, Sulfomidoacetic acids, Sulfonamidoethanols									
Perfluoroctanesulfonamide (FOSA)	754-91-6	ug/kg	<2.7	<14	<13	1.0 J	1.2 J	<0.078	
NMeFOSA	31506-32-8	ug/kg	<1.4	<6.9	<6.6	<0.79	<0.94	<0.039	
NEtFOSA	4151-50-2	ug/kg	<0.79	<4.0	<3.9	<0.76	<0.90	<0.023	
NMeFOSAA	2355-31-9	ug/kg	41 J	<65	<63	13	16	<0.37	
NEtFOSAA	2991-50-6	ug/kg	14 J	<62	<59	7.9	9.1	<0.35	
NMeFOSE	24448-09-7	ug/kg	9.9 J	<12	<11	11	12	<0.067	
NEtFOSE	1691-99-2	ug/kg	<1.2	<6.0	<5.8	3.1 J	5.7	<0.034	
Replacement Chemicals									
HFPO-DA (GenX) ⁽¹⁾	13252-13-6	ug/kg	<3.6	<18	<18	<0.66	<0.79	<0.10	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	ug/kg	<0.60	<3.0	<2.9	<0.63	<0.75	<0.017	
F-53B Major	756426-58-1	ug/kg	<0.89	<4.5	<4.3	<0.56 UJ	<0.67	<0.026	
F-53B Minor	763051-92-9	ug/kg	<0.73	<3.7	<3.5	<0.50	<0.59	<0.021	
Solids									
Percent Moisture	-	%	73.5	94.6	94.0	93.9	94.9	--	
Percent Solids	-	%	26.5	5.4	6.0	6.1	5.1	--	
Sum of Detected PFAS									
Sum of Detected PFAS	-	ug/kg	169.6	ND	ND	63.7	75.9	0.067	

Notes
 - = Value not applicable
 -- = Not analyzed

CAS RN = Chemical Abstracts Service Registry Number

ug/kg = micrograms per kilogram (equivalent to parts per billion [ppb])

< = Result not detected above laboratory method detection limit (MDL), reported as <MDL
 ND = Not detected

Data Qualifiers
 J = Estimated value
 UJ = Estimated nondetect

I = Value is EMPC (estimated maximum possible concentration).

Revised by: L. Auner, 9/27/2021
 Checked by: M. Ursin 9/27/2021

Footnotes

⁽¹⁾ GenX is a trade name for hexafluoropropylene oxide dimer acid (HFPO-DA).

Table 3: Polymer Results
Madison Metropolitan Sewerage District
Madison, Dane County, Wisconsin
TRC Project #390131.0001.0000

Sample Location ID			POLYMER-1	POLYMER-2	POLYMER-3	
Sample ID			POLYMER-1-20210506	POLYMER-2-20210506	POLYMER-3-20210506	DUP04-20210506
Sample Date			5/6/2021	5/6/2021	5/6/2021	
Analyte	CAS RN	Units				
Carboxylic Acids						
Perfluorobutanoic acid (PFBA)	375-22-4	ug/kg	<0.27	<0.26	0.077 J	<0.27
Perfluoropentanoic acid (PFPeA)	2706-90-3	ug/kg	<0.19 UJ	<0.17	<0.18	<0.18
Perfluorohexanoic acid (PFHxA)	307-24-4	ug/kg	<0.10	<0.094	<0.099	<0.098
Perfluoroheptanoic acid (PFHpA)	375-85-9	ug/kg	<0.072	<0.065	<0.068	<0.067
Perfluoroctanoic acid (PFOA)	335-67-1	ug/kg	<0.21	<0.19	<0.20	<0.20
Perfluorononanoic acid (PFNA)	375-95-1	ug/kg	<0.089	<0.080	<0.085	<0.084
Perfluorodecanoic acid (PFDA)	335-76-2	ug/kg	<0.054	<0.049	<0.052	<0.051
Perfluoroundecanoic acid (PFUnA)	2058-94-8	ug/kg	<0.089	<0.080	<0.085	<0.084
Perfluorododecanoic acid (PFDoA)	307-55-1	ug/kg	<0.17	<0.63	<0.16	<0.16
Perfluorotridecanoic acid (PFTriA)	72629-94-8	ug/kg	<0.13	<0.48 UJ	<0.12	<0.12
Perfluorotetradecanoic acid (PFTeA)	376-06-7	ug/kg	<0.13	<0.12 UJ	<0.13	<0.13
Sulfonic Acids						
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ug/kg	<0.062	<0.056	<0.059	<0.058
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	ug/kg	<0.050	<0.045	<0.047	<0.047
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ug/kg	<0.077	<0.069	<0.073	<0.072
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	ug/kg	<0.087	<0.078	<0.082	<0.081
Perfluoroctanesulfonic acid (PFOS)	1763-23-1	ug/kg	<0.50	<0.45	<0.47	0.48 J
Perfluorononanesulfonic acid (PFNS)	68259-12-1	ug/kg	<0.050	<0.045	<0.047	<0.047
Perfluorodecanesulfonic acid (PFDS)	335-77-3	ug/kg	<0.097	<0.087	<0.092	<0.091
Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	ug/kg	<0.15	<0.13	<0.14	<0.14
4:2 FTS	757124-72-4	ug/kg	<0.92	<0.83	<0.87	<0.86
6:2 FTS	27619-97-2	ug/kg	<0.37	<0.33	<0.35	<0.35
8:2 FTS	39108-34-4	ug/kg	<0.62	<0.56	<0.59	<0.58
Sulfonamides, Sulfomidoacetic acids, Sulfonamidoethanols						
Perfluoroctanesulfonamide (FOSA)	754-91-6	ug/kg	<0.20	<0.18	<0.19	<0.19
NMeFOSA	31506-32-8	ug/kg	<0.099	<0.38	<0.094	<0.093
NEtFOSA	4151-50-2	ug/kg	<0.059 UJ	<0.23	<0.23	<0.23
NMeFOSAA	2355-31-9	ug/kg	<0.97	<0.87	<0.92	<0.91
NEtFOSAA	2991-50-6	ug/kg	<0.92	<0.83	<0.87	<0.86
NMeFOSE	24448-09-7	ug/kg	<0.18	<0.16 UJ	<0.17	<0.17
NEtFOSE	1691-99-2	ug/kg	<0.089	<0.34 UJ	<0.085	<0.084
Replacement Chemicals						
HFPO-DA (GenX) ⁽¹⁾	13252-13-6	ug/kg	<0.27	<0.25	<0.26	<0.26
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	ug/kg	<0.045	<0.040	<0.042	<0.042
F-53B Major	756426-58-1	ug/kg	<0.067	<0.060	<0.063	<0.063
F-53B Minor	763051-92-9	ug/kg	<0.054	<0.049	<0.052	<0.051

Notes

CAS RN = Chemical Abstracts Service Registry Number

ug/kg = micrograms per kilogram (equivalent to parts per billion [ppb])

*+ = LCS and/or LCSD is outside acceptance limits, high biased

Data Qualifiers

J = Estimated value

UJ = Estimated nondetect

Revised by: L. Auner, 9/27/2021

Checked by: M. Ursin 9/27/2021

Footnotes

⁽¹⁾ GenX is a trade name for hexafluoropropylene oxide dimer acid (HFPO-DA).

Table 4: Combined Influent Calculation and Comparison to Effluent
Madison Metropolitan Sewerage District
Madison, Dane County, Wisconsin
TRC Project #390131.0001.0000

Sample Location ID		INFLUENT-02	INFLUENT-07	INFLUENT-08	INFLUENT-11	INFLUENT-18	Combined Influent (Calculated) ⁽²⁾	EFLUENT-PERM	Effluent >, <, or = Influent ⁽³⁾
Sample ID	INFLUENT -02-20210506	INFLUENT -07-20210506	INFLUENT -08-20210506	INFLUENT -11-20210506	INFLUENT -18-20210506	EFLUENT-PERM- 20210506		5/6/2021	
Sample Date	5/6/2021	5/6/2021	5/6/2021	5/6/2021	5/6/2021	5/6/2021		5/6/2021	
Flow Rate (MGD)	5.82	4.18	6.68	8.87	11.81	37.36		39.05	
% of Combined Influent Flow Rate	16%	11%	18%	24%	32%	100%			
Analyte	CAS RN	Units							
Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	ng/L	4.6	21	5.8	3.3 J	10	8.05	10 >
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/L	3.7	15	160	<0.42	5.6	32.63	15 <
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	4.6	30	5.2	4.1	8.1	8.54	24 >
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.3 J	4.8	1.1 J	0.82 J	2.3	1.86	3.5 >
Perfluoroctanoic acid (PFOA)	335-67-1	ng/L	3.3	11	2.2	2.2	7.8	5.13	9.7 >
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	0.66 J	1.3 J	0.52 J	0.72 J	0.93 J I	0.81	0.81 J =
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	<0.25	1.1 J	0.48 J	0.54 J	1.2 J	0.72	1.4 J >
Perfluoroundecanoic acid (PFUnA)	2058-94-8	ng/L	<0.89	<0.93	<0.93	<0.95	<0.90	0	< 0.96 -
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	<0.45 UJ	<0.46 UJ	<0.47 UJ	<0.48 UJ	<0.45 UJ	0	< 0.48 -
Perfluorotridecanoic acid (PFTriA)	72629-94-8	ng/L	<1.1	<1.1 UJ	<1.1	<1.1 UJ	<1.1	0	< 1.1 -
Perfluorotetradecanoic acid (PFTeA)	376-06-7	ng/L	<0.59	<0.61 UJ	<0.62	<0.63 UJ	<0.60	0	< 0.64 -
Sulfonic Acids									
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ng/L	1.8 I	5.8	1.6 J	1.2 J	4.0	2.76	3.9 J >
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	ng/L	<0.24	<0.25	<0.25	<0.26	1.6	0.51	0.54 J >
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ng/L	4.9 I	7.6	3.3 I	2.7 I	15	7.59	7.5 <
Perfluoroheptanesulfonic Acid (PFHpsS)	375-92-8	ng/L	<0.15	<0.16	<0.16	<0.16	0.35 J	0.11	< 0.17 -
Perfluoroctanesulfonic acid (PFOS)	1763-23-1	ng/L	6.9 I	6.2 I	2.6 I	3.5 I	12	6.86	3.7 <
Perfluoronananesulfonic acid (PFNS)	68259-12-1	ng/L	<0.30	<0.31	0.58 J I	<0.32	<0.30	0.10	< 0.32 -
Perfluorodecanesulfonic acid (PFDS)	335-77-3	ng/L	<0.26	<0.27	<0.27	<0.28	<0.26	0	< 0.28 -
Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	ng/L	<0.79	<0.82	<0.82	<0.84	<0.80	0	< 0.85 -
4:2 FTS	757124-72-4	ng/L	<0.19	<0.20	<0.20	<0.21	<0.20	0	< 0.21 -
6:2 FTS	27619-97-2	ng/L	<2.0	<2.1	<2.1	<2.2	3.8 J	1.20	< 2.2 -
8:2 FTS	39108-34-4	ng/L	<0.37	<0.39	<0.39	<0.40	0.46 J I	0.15	< 0.4 -
Sulfonamides, Sulfomidoacetic acids, Sulfonamidoethanols									
Perfluorooctanesulfonamide (FOSA)	754-91-6	ng/L	<0.79	<0.82	<0.83	<0.85	<0.81	0	< 0.86 -
NMeFOSA	31506-32-8	ng/L	<0.35	<0.36	<0.36	<0.37	<0.35	0	< 0.38 -
NEtFOSA	4151-50-2	ng/L	<0.71	1.6 J	<0.74	<0.75	<0.71	0.18	< 0.76 -
NMeFOSAA	2355-31-9	ng/L	<0.97	4.6	<1.0	<1.0 UJ	<0.99	0.51	1.4 J >
NEtFOSAA	2991-50-6	ng/L	<1.1 UJ	2.3 J	<1.1 UJ	<1.1 UJ	1.3 J	0.67	< 1.1 -
NMeFOSE	24448-09-7	ng/L	1.3 J	4.7	2.4 J	4.4	2.9 J	3.12	< 1.2 <
NEtFOSE	1691-99-2	ng/L	<0.69	1.0 J	<0.72	<0.74	3.7	1.28	< 0.75 <
Replacement Chemicals									
HFPO-DA (GenX) ⁽¹⁾	13252-13-6	ng/L	<1.2	<1.3	<1.3	<1.3	<1.2	0	< 1.3 -
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	ng/L	1.2 J I	<0.34	<0.34	<0.35	3.2 I	1.20	< 0.35 <
F-53B Major	756426-58-1	ng/L	<0.19	<0.20	<0.20	<0.21	<0.20	0	< 0.21 -
F-53B Minor	763051-92-9	ng/L	<0.26	<0.27	<0.27	<0.28	<0.26	0	< 0.28 -
Sum of PFAS Results									
Sum of detected PFAS	-	ng/L	34.3	118.0	185.8	23.5	84.2	84.0	81.5 <

Notes

Data Qualifiers

= Value not applicable

I = Value is EMPC (estimated maximum possible concentration).

-- = Not analyzed

CAS RN = Chemical Abstracts Service Registry Number

ng/L = nanograms per liter (equivalent to parts per trillion [ppt])

MGD = millions of gallons per day

< or 0 = Result not detected above laboratory method detection limit (MDL), reported as <MDL, or reported as 0 for combined influent (see footnote 2).

Footnotes

⁽¹⁾ GenX is a trade name for hexafluoropropylene oxide dimer acid (HFPO-DA).

⁽²⁾ Combined influent concentrations were calculated as an average of the results from five pump station samples weighted by their respective flow rates, and nondetect results were represented with concentrations of zero for the purpose of the calculation.

⁽³⁾ In comparing influent to effluent, if the effluent concentration is non-detect and the effluent detection limit is greater than the detected combined influent concentration, no comparison is made.

Revised by: L. Auner, 9/27/2021

Checked by: M. Ursin 9/27/2021

Table 5: Surface Water or Effluent Criteria for PFAS from Other States

Madison Metropolitan Sewerage District

Madison, Dane County, Wisconsin

TRC Project #390131.0001.0000

State		Alaska	Colorado	Michigan	Michigan	Minnesota	Minnesota	Oregon
Standard/Guidance		Action Level	Translation Level	Human Noncancer Value	Human Noncancer Value	Health-based Value	Health-based Value	Initiation Level ⁽⁴⁾
Promulgated Rule (Y/N) ⁽¹⁾		N	Y	Y	Y	N	N	Y
Type		SW (water supply)	SW (drinking)	SW (non-drinking)		SW-Lake	SW-River	Municipal Wastewater Effluent
Analyte	CAS RN	Units						
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	-	-	-	-	-	300,000
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	70 ⁽²⁾	70 ⁽³⁾	420	12,000	-	24,000
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	-	70 ⁽³⁾	-	-	-	1,000
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ng/L	-	400,000	-	-	-	-
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ng/L	-	700	-	-	-	-
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ng/L	70 ⁽²⁾	70 ⁽³⁾	11	12	12	300,000
8:2 FTS	39108-34-4	ng/L	-	70 ⁽³⁾	-	-	-	-
Perfluorooctanesulfonamide (FOSA)	754-91-6	ng/L	-	70 ⁽³⁾	-	-	-	200
NMeFOSAA	2355-31-9	ng/L	-	70 ⁽³⁾	-	-	-	-
NEtFOSAA	2991-50-6	ng/L	-	70 ⁽³⁾	-	-	-	-

Notes

- = Value not established

CAS RN = Chemical Abstracts Service Registry Number

SW = surface water

ng/L = nanograms per liter (equivalent to parts per trillion [ppt])

Footnotes

⁽¹⁾ Promulgated (Yes/No) - Values are considered promulgated if they have been finalized into law or if the table of values is referenced in supporting law. Values are not considered promulgated when they are not finalized into law, but are listed here as they are considered final guidance and are confirmed to be in use by the applicable state. Proposed, draft, or recommended values are not included in this table.

⁽²⁾ Applies to the individual results for PFOA and PFOS, as well as the sum of PFOA + PFOS.

⁽³⁾ Translation level of 70 ng/L applies to PFOA, PFOS, and PFNA individually, and to the sum of PFOA, PFOS, PFNA, and adjusted concentrations of parent constituents NEtFOSAA, NMeFOSAA, FOSA, and 8:2 FTS. See Colorado Department of Public Health and Environment (2020) for details.

⁽⁴⁾ If initiation levels are exceeded in municipal wastewater effluent, wastewater facility must develop pollution prevention plan (Oregon DEQ, 2019).

Data Sources (full references provided in report)

Alaska Department of Environmental Conservation (2019)

Interstate Technology and Regulatory Council (2021)

Colorado Department of Public Health and Environment (2020)

Michigan EGLE (2020)

Oregon DEQ (2019)

Revised by: L. Auner, 9/27/2021

Checked by: M. Ursin 9/27/2021

Table 6: Biosolids Criteria for PFAS from Other States
Madison Metropolitan Sewerage District
Madison, Dane County, Wisconsin
TRC Project #390131.0001.0000

State		Michigan			Maine
Promulgated Rule (Y/N) ⁽¹⁾		N			Y
Description		Do Not Land Apply	Limit Land Application	Additional Investigation Suggested	Screening Level
Analyte	CAS RN	Units			
Perfluoroctanoic acid (PFOA)	335-67-1	ug/kg	-	-	2.5
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ug/kg	-	-	1,900
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ug/kg	150	50	20
Notes					
- = Value not established or not applicable					
CAS RN = Chemical Abstracts Service Registry Number					
ug/kg = micrograms per kilogram (equivalent to parts per billion [ppb])					

Revised by: L. Auner, 9/27/2021

Checked by: M. Ursin 9/27/2021

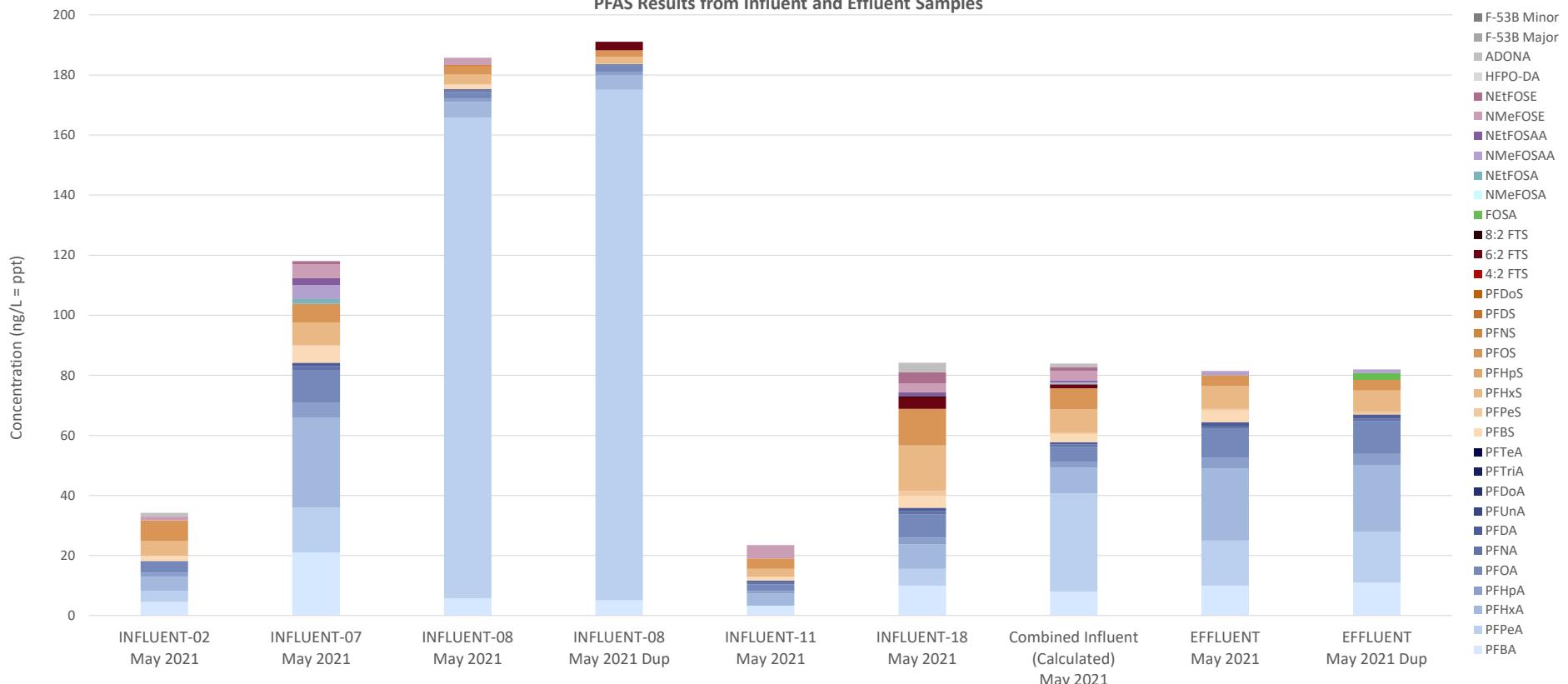
Footnotes

- ⁽¹⁾ Promulgated (Yes/No) - Values are considered promulgated if they have been finalized into law or if the table of values is referenced in supporting law. Values are not considered promulgated when they are not finalized into law, but are listed here as they are considered final guidance and are confirmed to be in use by the applicable state. Proposed, draft, or recommended values are not included in this table.

Data Sources (full references provided in report)

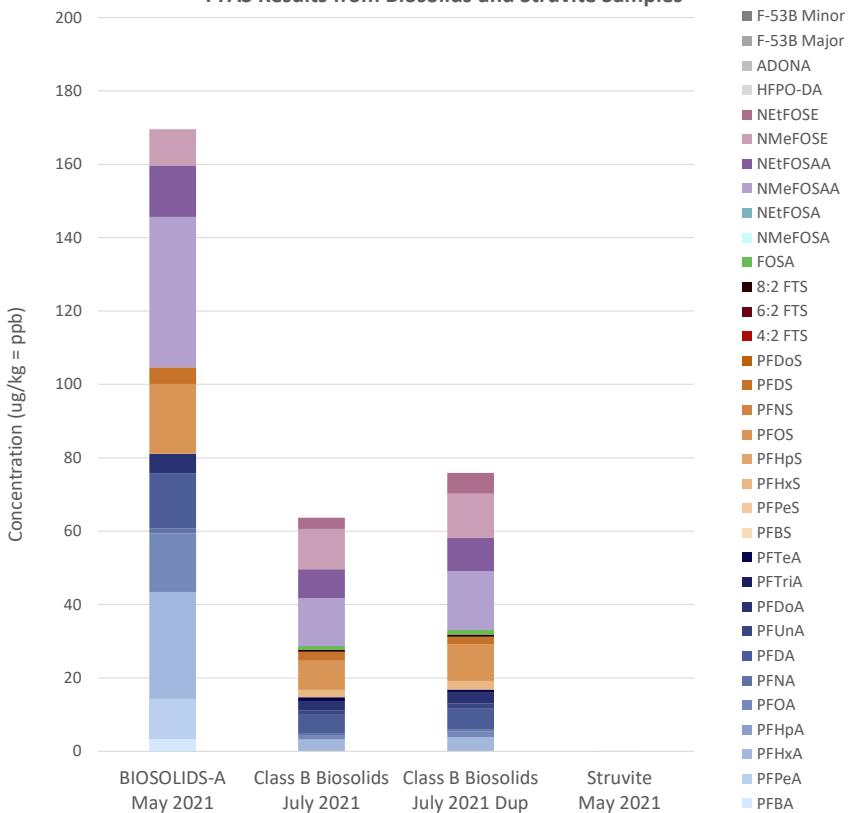
- Michigan EGLE (2021b)
Maine DEP (2018)

Figure 1
PFAS Results from Influent and Effluent Samples



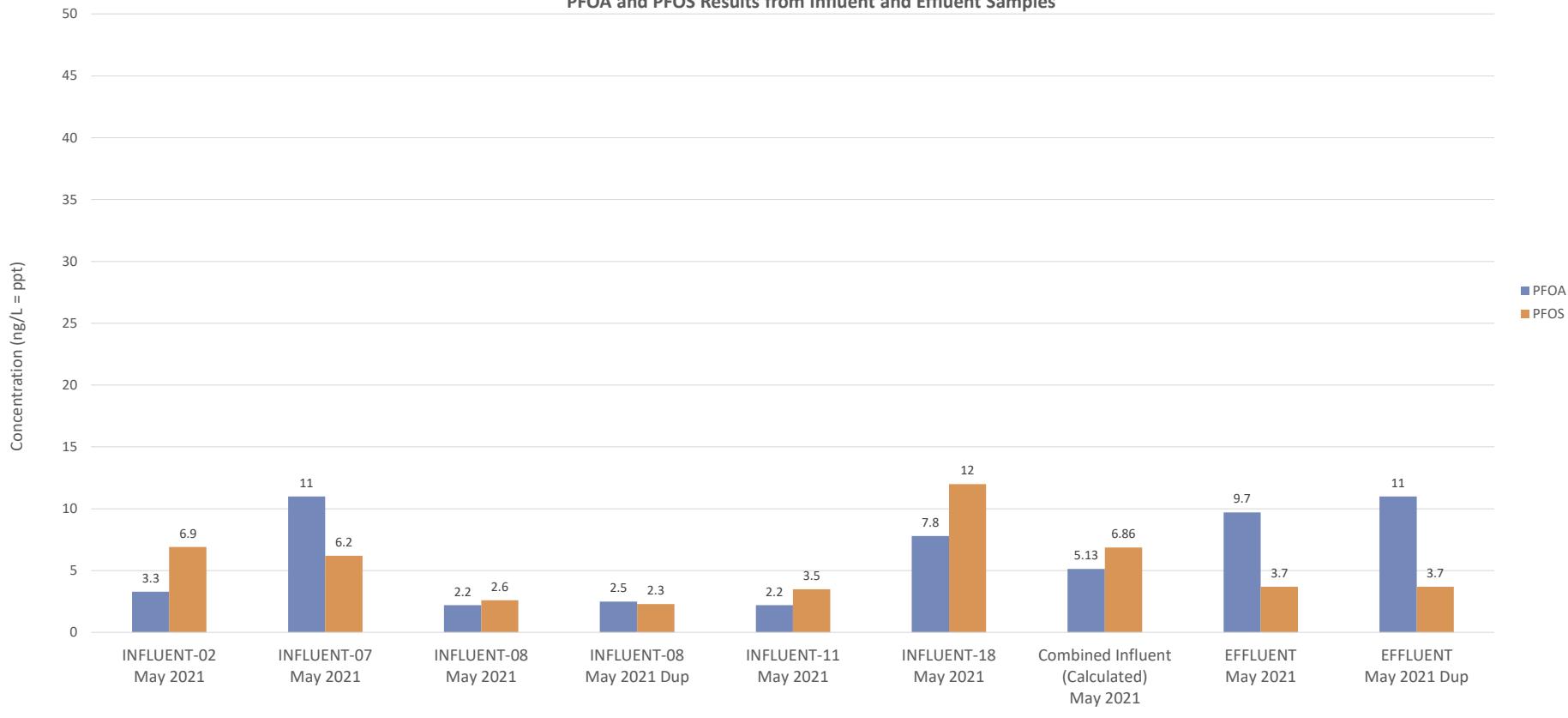
Revised by: L. Auner, 9/23/2021
 Checked by: M. Ursin 9/26/2021

Figure 2
PFAS Results from Biosolids and Struvite Samples



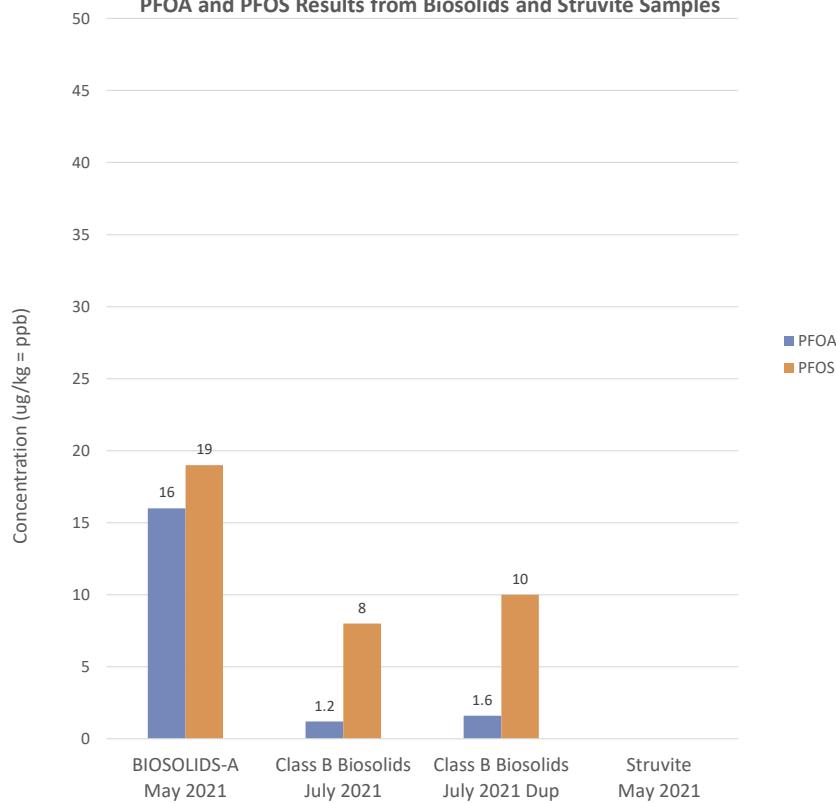
Prepared by: L. Auner, 8/26/2021
 Checked by: A. Enright, 8/27/2021

Figure 3
PFOA and PFOS Results from Influent and Effluent Samples



Prepared by: L. Auner, 9/24/2021
Checked by: M. Ursin 9/26/2021

Figure 4
PFOA and PFOS Results from Biosolids and Struvite Samples



Prepared by: L. Auner, 9/24/2021
Checked by: M. Ursin 9/26/2021



Appendix A: PFAS Sampling SOP

TRC SOP for PFAS Sampling at MMSD Wastewater Treatment Facility

April 28, 2020

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ACRONYM LIST

HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	High-density polyethylene
LDPE	Low-density polyethylene
MMSD	Madison Metropolitan Sewerage District
OSHA	Occupational Safety and Health Administration
PFAS	Per- and polyfluoroalkyl substances
PPE	Personal protective equipment
PTFE	Polytetrafluoroethylene
PVC	Polyvinyl chloride
SAB	Sampling and Analysis Blueprint
SOPs	Standard operating procedures
WAS	Waste Activated Sludge
WWTP	Wastewater treatment plant

1.0 Introduction

1.1 Scope and Applicability

This Standard Operating Procedure (SOP) was prepared to direct TRC personnel in the procedures for per- and polyfluoroalkyl substances (PFAS) sampling at the Madison Metropolitan Sewerage District's (MMSD's) Nine Springs Wastewater Treatment Facility, including sampling of plant influent, effluent, biosolids, struvite, polymers, and other in-plant sampling. The sampling protocols have been designed to aid in the collection of representative samples from various points of the wastewater treatment process and prevent cross-contamination that could occur during the sampling process. Other state or federal requirements may be above and beyond the scope of this SOP and will be followed, if applicable. In all instances, the actual procedures used should be documented and described in the field notes.

1.2 Summary of Method

Sampling methods vary depending on the type of sample media (liquid, solid, or slurry), the sample type (grab or composite) and the wastewater treatment plant equipment from which the sample is collected (such as tanks, pipes, belts, or basins). In general, sample locations such as tanks, pipes, and taps will be sampled by collecting a grab sample directly into the sample container, if possible, or by using disposable or reusable equipment such as scoops, dippers, or pumps with tubing that extends into the sample media. Composite samples will be collected from the dedicated and fixed automatic samplers for the plant influent and the waste activated sludge (WAS) from the clarifier, and from portable automatic samplers for the plant effluent.

Given the prevalence of PFAS compounds in many types of commonly used sampling equipment and commercial products and the low concentrations at which PFAS will be analyzed, it is important to follow this SOP to prevent cross-contamination of the samples. Procedures for sampling and decontamination are designed to prevent cross-contamination that may occur from field clothing, personal protective equipment (PPE), food and/or other products and materials handled by the sampling personnel, and from the sampling equipment itself.

1.3 Equipment

The following equipment may be used to collect samples from the wastewater treatment plant (WWTP). Specific precautions must be taken for PFAS sampling in order to avoid sample cross-contamination. Refer to Section 1.5 for guidance on materials that should and should not be used during PFAS sampling events. Site-specific conditions may warrant the use of additional equipment or deletion of items from this list.

- Appropriate level of PPE as specified in the site-specific Health and Safety Plan (HASP)
- Dippers, scoops, trowels, and buckets, with extension rod(s) if needed
- Portable automated composite samplers
- Peristaltic pump and tubing
- Sample containers
- Sample bottle labels

-
- Sample coolers
 - Ice
 - Field book and/or field forms
 - Chain-of-custody forms
 - Indelible marking pens
 - Plastic bags (e.g., Ziploc®)
 - Equipment decontamination supplies
 - Map of sampling locations
 - Project-specific work plan

A project-specific equipment list should be developed prior to each sampling event consistent with this SOP.

1.4 Health & Safety Considerations

TRC personnel will be on site when implementing this SOP. Therefore, TRC personnel shall prepare and follow a site-specific HASP, and use the appropriate level of PPE as defined in the HASP. The decontamination and staging areas will be defined in the site-specific HASP.

As indicated in the Request for Bids (MMSD, April 2020), air monitoring for hydrogen sulfide must be conducted using a gas meter prior to entering the WAS thickening building for the collection of the “before acid digestion” sample.

1.5 PFAS-Specific Precautions

Many materials commonly used in environmental sampling can potentially contain PFAS. Prior to PFAS sampling, field staff should review all materials and sampling protocols. Any sampling equipment, sample containers, or other materials that come into direct contact with the sample should be PFAS-free. When following proper sampling protocols, items that do not contact the sample material or sampling equipment should not have the potential to contaminate the sample. However, care should be taken to avoid any cross-contamination if these materials do come into contact with sample material or sampling equipment, and a conservative approach is recommended.

Specific guidance for sampling methods and equipment are provided in Section 2. Because preventing cross-contamination is critical to data quality, a summary of common items that are acceptable or that must be avoided when PFAS-sampling are highlighted below.

1.5.1 Equipment Which May Be in Contact with Samples

- Sample-contacting equipment such as sample containers, dippers, scoops, buckets, extension rods, or tubing must be made of materials known to be PFAS-free, such as stainless steel, uncoated aluminum, high-density polyethylene (HDPE), polypropylene, polyvinyl chloride (PVC), or silicone.

- Do not use any equipment or materials that contain polytetrafluoroethylene (PTFE) (includes trademark Teflon®), low-density polyethylene (LDPE) (unless known to be PFAS-free), or other fluoropolymers during sample collection. Items that may contain fluoropolymers include, but are not limited to tubing, galvanized or aluminized steel, aluminum foil, waterproof/resistant paper products, and Teflon® tape.
- If materials are used to secure the sample bottle to an extension rod, they should be made of natural rubber, nylon, uncoated metal springs, or other PFAS-free material.
- Do not use LDPE or glass sample containers, or containers with Teflon®-lined lids. HDPE or polypropylene containers and caps are acceptable for sample storage. These containers must be provided by the analytical laboratory.

1.5.2 Other Field Equipment and Supplies

- Avoid using waterproof labels for sample bottles. The use of paper labels covered with clear tape or placed in Ziploc® bags to avoid moisture on the sample label is acceptable.
- Avoid regular or thick-point Sharpies® when taking notes or labeling individual sample bottles. Ballpoint pens or fine and ultra-fine Point Sharpies® are acceptable.
- Do not use waterproof field books, plastic clipboards, or spiral bound notebooks. (Field notes recorded on loose paper field forms that are maintained in aluminum or Masonite clipboards, or on a field tablet computer are acceptable).
- Do not use Post-It® Notes during sample handling.

1.5.3 Field Clothing and PPE

- Tyvek® suits should not be worn during PFAS sampling events. Cotton coveralls may be worn.
- Boots and other field clothing (including rain gear) containing Gore-Tex™ or other waterproof or water-resistant material should not be worn. Boots made with polyurethane and PVC are acceptable.
- Stain resistant clothing should not be worn.
- Avoid wearing new clothing (recommended 6 washings since purchase) or clothing that has been recently laundered with fabric softeners. Clothing made of cotton is preferred.

1.5.4 Personal Care Products

- Do not bring personal care products such as sunscreen or insect repellent into the sampling area or decontamination area. If it is necessary to handle personal care products, do so after moving to the staging area and removing any PPE that will be worn during sampling. Wash hands after handling personal care products before resuming sampling.

1.5.5 Food and Beverage Packaging

- Food and drink should not be allowed within the sampling area or decontamination area. Pre-wrapped food or snacks should not be in the possession of sampling personnel during sampling. Bottled water and hydration drinks (e.g., Gatorade®) may be consumed in the staging area only.

1.6 Personnel Qualifications

Since this SOP will be implemented at sites or in work areas that entail potential exposure to toxic chemicals or hazardous environments, all TRC personnel must be adequately trained. Project- and client-specific training requirements for samplers and other personnel on site should be developed in project planning documents, such as the sampling plan or project-specific work plan. These requirements may include:

- Occupational Safety and Health Administration (OSHA) 40-hour Health and Safety Training for Hazardous Waste Operations and Emergency Response (HAZWOPER) workers
- 8-hour annual HAZWOPER refresher training

2.0 Procedures

2.1 Pre-Sampling Activities

- a. Request the laboratory provide PFAS-free water to be used for the equipment blank, field blank, and the final step of the decontamination process. The laboratory must be able to provide certification that the water is PFAS-free.
- b. Decontaminate any non-disposable sampling equipment that has previously been used prior to mobilization.
- c. Wear nitrile gloves at all times while prepping sample containers. Organize sampling equipment, taking care not to allow cross-contamination. This can be accomplished by laying new polyethylene sheeting near the sample location or using new buckets.
- d. Prepare to collect field notes on loose paper field forms that are maintained in aluminum or Masonite clipboards, or on a field tablet computer.
- e. Review the PFAS-precautions identified in this SOP with field staff.
- f. Record the sample location, time, date, and any deviations from the SOP in field notes and/or on field forms.

2.2 Sampling Procedures

2.2.1 Precautions During Sampling

The following precautions should be taken during PFAS sampling:

- a. Wash hands with soap and water after leaving vehicle, eating, or applying personal care products and before contacting sampling containers or equipment.

-
- b. Sampling staff will wear nitrile gloves at all times while prepping sample containers, collecting samples, or handling samples.
 - c. Don new nitrile gloves between each sample and at any time during the sampling process if unnecessary items are contacted.
 - d. Don new nitrile gloves between contacting the note-taking materials and handling the samples or sample containers.
 - e. Open sample container immediately prior to sampling and cap it immediately after sampling. Do not set the lid down unless it is placed on a PFAS-free surface.
 - f. Samples bottles should be individually bagged with Ziploc® bags and returned to the sampling cooler on ice after sampling.

2.2.2 Liquid Grab Samples

Liquid grab samples collected directly into the laboratory-provided sample container are preferred. An extension rod can be used to extend the sample container to the sampling point, if the connections are PFAS-free. If the water at the sample point is stagnant and deeper than the height of the sample container, then the sample container should be immersed into the water column to collect the sample. This is because PFAS have a tendency to accumulate at the air-water interface due to their surfactant properties. (Check the sampling and analysis plan if a surface sample is also needed at a location where there is not turbulent flow. Site-specific plans may call for submerged and/or surface samples at some locations.)

If direct sampling into the laboratory-provided sample container is not possible, alternative methods are acceptable. ***Any containers or equipment used in these alternative methods must be PFAS-free, and the equipment must be either disposable or decontaminated between sample locations.*** Alternative methods include, but are not limited to using a dipper to collect the liquid sample to transfer into the laboratory-provided container, or first collecting the liquid in a larger container (e.g., 5-gallon HDPE bucket) and then subsampling the liquid into the laboratory-provided container. If a grab sample needs to be subsampled from a larger container, then the laboratory-provided sample container should be filled by submerging it into the liquid in the larger container.

If the exterior of a sample container requires cleaning after sample collection, it may be wiped or rinsed. Prior to doing so, the sample container must first be tightly sealed, and any rinse should be with PFAS-free water.

Typically, two 250 mL containers will be filled for liquid grab samples for submittal to the analytical laboratory.

2.2.3 Solid Grab Samples

Grab samples of materials with high solids content that are in piles or containers should be collected using an HDPE or stainless-steel trowel and then placing the sample directly into the laboratory-provided sample container. A representative sample should be collected at a point below the surface of the bulk material.

Grab samples of slurries should be sampled directly into the laboratory-provided containers when possible (e.g., catch the biosolids in container as they exit from the gravity belt thickener). If direct

sampling is not possible, alternative methods are acceptable. **Any containers or equipment used in these alternative methods must be PFAS-free, and the equipment must be either disposable or decontaminated between sample locations.** Alternative methods include using a HDPE or stainless-steel dipper or scoop to collect the sample to transfer into the laboratory-provided container, or first collecting the material in a larger container (e.g., 5-gallon HDPE bucket) and then subsampling into the laboratory-provided container.

Solid grab samples will typically be put into one 4-8 oz. HDPE container for submittal to the analytical laboratory.

2.2.4 Composite Samples

MMSD has dedicated and fixed automatic composite samplers at each of the five individual pump intake stations and at the WAS at the clarifier. Composite sampling using the dedicated automated composite samplers should be performed for these fixed locations. To prevent contamination from the dedicated sampler, the strainer should be decontaminated or replaced between each sampling event. Additionally, the suction line, distribution nozzle and sample bottle should always be replaced between each sampling event. The sample containers in the dedicated composite samplers should be evaluated to ensure that they are PFAS-free and should be replaced with PFAS-free containers if they are not.

Portable automated composite samplers should be avoided, but may be used when called for in the site-specific sampling and analysis plan. Use fittings and tubing that are PFAS free and follow equipment decontamination procedures for the portable composite sampler. Collection of an equipment blank using PFAS-free water is recommended prior to sample collection if a single sample is collected. If multiple samples are collected, an equipment blank could be collected after decontamination.

Typically, two 250 mL containers will be filled for the composite samples submitted to the analytical laboratory. If the composite sampler container has a tapered neck or otherwise does not allow direct subsampling, the sample material should be poured directly into the laboratory-provided sample container(s) or should be subsampled as described in Section 2.2.2 for liquid grab samples.

2.2.5 Equipment Decontamination

Sampling equipment such as buckets, scoops, or extension rods that are reused between sample locations must be decontaminated between each sample. Special care should be taken when decontaminating equipment used for sampling for PFAS.

- a. Personnel involved with decontamination should wear a new pair of nitrile gloves after each decontamination procedure when handling equipment to avoid re-contamination. Avoid handling unnecessary items with nitrile gloves.
- b. Use new plastic buckets for wash and rinse water.
- c. Prepare a bucket with a mixture of potable water and PFAS-free soap. Use only Alconox® or Liquinox® soap; do not use Decon 90. Do not use an excessive amount of the soap (approximately 1 tablespoon of soap to 5 gallons of water), or rinsing the soap residue off of the equipment will be difficult.

-
- d. Brush or scrape any visible material off of the sampling equipment into a designated area before getting equipment wet.
 - e. Using a clean, coarse scrub brush, submerge and wash the sampling equipment in the soap solution in the first container, removing all visible dirt or sample material. Allow excess soap to drain off the equipment into the container when finished. New polyethylene, PVC, nylon, or metal bristle brushes should be used for mechanical cleaning methods.
 - f. Rinse the equipment with potable water over an appropriate container.
 - g. Include a final triple rinse with laboratory certified PFAS-free water in a new, clean 5-gallon bucket, or dispensed from an HDPE spray bottle. Commercially available deionized water in an HDPE container may be used for decontamination if the water and container are known to be PFAS-free.
 - h. Place decontaminated equipment on a clean surface (e.g., polyethylene sheeting) or inside a clean container). Do not store equipment on or cover equipment with aluminum foil after decontamination.
 - i. Dispose of decontamination fluids appropriately.

2.3 Post-Sampling Activities

- a. Label each sample. Avoid using waterproof labels for sample bottles. The use of paper labels covered with clear tape or placed in Ziploc® bags to avoid moisture on the sample label is acceptable.
- b. Place all samples in a cooler with ice. Regular ice in Ziploc® bags can be used. Blue Ice® (chemical ice packs) must not be used to cool samples or be used in sample coolers. Samples for PFAS analysis must be shipped at <10°C. Standard coolers are acceptable.
- c. The chain-of-custody should be filled out, signed, and placed in the cooler in a Ziploc® bag. Custody seals should be placed on the exterior of the cooler prior to delivering to the laboratory or shipping to the laboratory for next day receipt.
- d. Ensure samples are delivered to the laboratory well before the required holding time expires.

3.0 Quality Assurance/Quality Control

The quality control samples in MMSD's Sampling and Analysis Plan will be collected during sampling. The procedures for collecting the quality control samples are defined below:

3.1 Field Duplicates

The following procedures should be used for collecting field duplicates:

- a. Each duplicate sample will be typically submitted to the laboratory as a "blind" duplicate sample, in that a unique sample identification not tied to the primary sample identification will be assigned to the duplicate (e.g., DUP-01). Standard labeling procedures used for sampling will be employed. However, a sample collection time

-
- will not be included on the sample label or the chain-of-custody form. The actual source of the duplicate sample will be recorded in the field notes and/or on field forms.
- b. Each duplicate sample will be collected simultaneously with the actual sample by alternately filling sample and duplicate containers if more than one container is required for the proposed analyses.
 - c. All collection procedures outlined for sampling will be followed for each duplicate sample.

3.2 Field Blanks

The field blank is collected by pouring PFAS-free water into a sampling container while at the sampling site. The water is containerized in an appropriate bottle and shipped to the laboratory with the other field samples. The results are used to assess whether ambient/surrounding air conditions may have influenced analytical results.

3.3 Equipment Blanks

The equipment blank is collected using PFAS-free water run through the equipment or rinsed across the sample-contacting surfaces of the equipment before sampling (e.g., portable automated composite sampler) or after decontamination to demonstrate effective decontamination and the lack of contamination coming from the equipment materials. The equipment blanks are collected in the same sample containers as field samples. If dedicated or disposable systems are used, equipment blanks are not required, although an initial blank could be performed to demonstrate that the dedicated equipment is clean prior to use. If only dedicated tubing is used, the equipment blank will include only the pump in subsequent sampling events.

Ideally, the reagent water should come from the laboratory and be certified PFAS-free. If not certified and/or if not from the laboratory performing the analyses, a separate water blank that has not run through the sampling equipment should be sent to the laboratory for analysis.

4.0 References

Michigan Department of Environmental Quality (MDEQ). 2018. *Wastewater PFAS Sampling Guidance*. Revised October 11.

MDEQ. 2018. *General PFAS Sampling Guidance*. Revised October 16.



Appendix B: Photographic Log

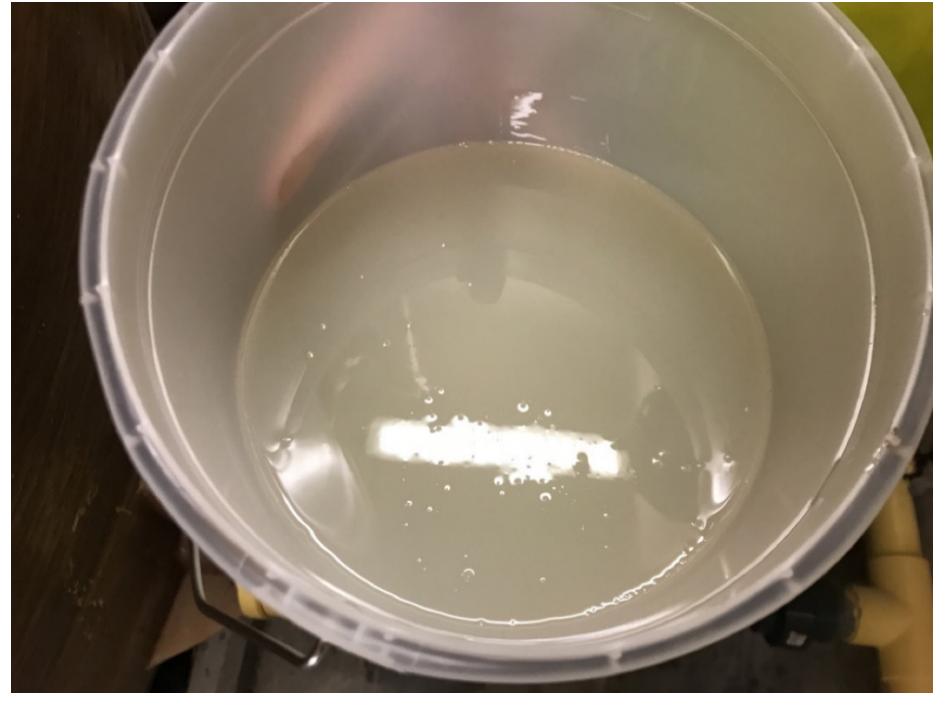
Photographic Log

Client Name:		Site Location:	Project No.:	
Madison Metropolitan Sewerage District		1610 Moorland Road Madison, WI 53713	390131.0001	
Photo No.	Date			
1	5/6/2021	<p>Description Carboys containing composite samples of influent and effluent, stored in walk-in cooler</p> 		
Photo No.	Date	<p>Description Class A cake biosolids pile showing location of sample collection</p> 		
2	5/6/2021			

Photographic Log

Client Name:		Site Location:	Project No.:	
Madison Metropolitan Sewerage District		1610 Moorland Road Madison, WI 53713	390131.0001	
Photo No.	Date			
3	5/6/2021	Description Class B biosolids sample collected from end of gravity belt thickener (foreground) 		
Photo No.	Date			
4	5/6/2021	Description Struvite sample collected from sack of off-spec struvite		

Photographic Log

Client Name:		Site Location:	Project No.:	
Madison Metropolitan Sewerage District		1610 Moorland Road Madison, WI 53713	390131.0001	
Photo No.	Date			
5	5/6/2021			
Description				
Polymer 1 sample spigot				
Photo No.	Date			
6	5/6/2021			
Description				
Polymer 1				

Photographic Log

Client Name:		Site Location:	Project No.:
Madison Metropolitan Sewerage District		1610 Moorland Road Madison, WI 53713	390131.0001
Photo No.	Date		
7	5/6/2021		
Description			
Polymer 2 sample spigot			
Photo No.	Date		
8	5/6/2021		
Description			
Polymer 3 sample spigot			



Appendix C: Laboratory Analytical Reports



Environment Testing
America



ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-73382-1
Client Project/Site: MMSD PFAS
Revision: 2

For:
TRC Environmental Corporation.
708 Heartland Trail
Madison, Wisconsin 53717

Attn: Mike Ursin

Authorized for release by:
7/12/2021 2:14:48 PM

David Alltucker, Project Manager I
(916)374-4383
David.Alltucker@Eurofinset.com

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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Qualifiers

LCMS	Qualifier Description
*5-	Isotope dilution analyte is outside acceptance limits, low biased.
*5+	Isotope dilution analyte is outside acceptance limits, high biased.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD recovery exceeds control limits.
H	Sample was prepped or analyzed beyond the specified holding time
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: TRC Environmental Corporation.

Project/Site: MMSD PFAS

Job ID: 320-73382-1

Job ID: 320-73382-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative 320-73382-1

Revision 6-28-2021: This report has been revised to include 1x injections on Biosolid samples.

Receipt

The samples were received on 5/7/2021 10:05 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 1.0° C, 2.0° C and 3.1° C.

Receipt Exceptions

The container label for the following sample(s) did not match the information listed on the Chain-of-Custody (COC): Samples#10, 11, and 12 COC lists to receive 8 container pre-sample, however lab received 6 container pre-sample. Sample container count was logged in based on how many containen received. POLYMER-1-20210506 (320-73382-10), POLYMER-2-20210506 (320-73382-11) and POLYMER-3-20210506 (320-73382-12).

LCMS

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analytes were outside of the established ratio limits. The qualitative identification of the analytes have some degree of uncertainty, and the reported values may have some high bias. However, analyst judgment was used to positively identify the analytes.

Method 537 (modified): Results for samples BIOSOLIDS-A-20210506 (320-73382-7), BIOSOLIDS-B-20210506 (320-73382-8), DUP03-20210506 (320-73382-15), (320-73382-A-7-B MS) and (320-73382-A-7-C MSD) were reported from the analysis of a diluted extract due to high concentration of the target analytes and matrix interferences in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits. Because of this dilution, the matrix spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Method 537 (modified): The matrix spike / matrix spike duplicate (MS/MSD) recoveries for several analytes in preparation batch 320-488275 and analytical batch 320-489473 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 537 (modified): The Isotope Dilution Analyte (IDA) recoveries associated with the following samples are below the method recommended limit for 13C2 PFDoA and d5-NEtFOSAA: INFLUENT-02-20210506 (320-73382-1) and INFLUENT-08-20210506 (320-73382-3). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples. Re-analysis confirms the low IDA recoveries. The original analysis is reported.

Method 537 (modified): Several Isotope Dilution Analyte (IDA) recoveries associated with the following samples are below the method recommended limits: INFLUENT-07-20210506 (320-73382-2) and INFLUENT-11-20210506 (320-73382-4). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples. Re-analysis confirms the low IDA recoveries. The original analysis is reported.

Method 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for M2-8:2 FTS the following samples: BIOSOLIDS-B-20210506 (320-73382-8), DUP03-20210506 (320-73382-15), (320-73382-A-7-B MS) and (320-73382-A-7-C MSD). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries. The sample was re-analyzed with at diliuton, both sets of data reported per client request

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for several IDA: POLYMER-1-20210506 (320-73382-10). The sample was re-extracted outside of holding time and the IDAs were in control. 13C4 PFBA is significantly below limits in the original extraction, therefore, both sets of data were reported for the associated target analyte. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Method 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for M2-8:2 FTS and d9-N-EtFOSE-M in the following sample: POLYMER-1-20210506 (320-73382-10). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries. The sample was re-analyzed with concurring results, therefore, the data was

Case Narrative

Client: TRC Environmental Corporation.

Project/Site: MMSD PFAS

Job ID: 320-73382-1

Job ID: 320-73382-1 (Continued)

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

reported.

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for several IDA: POLYMER-2-20210506 (320-73382-11). The sample was re-extracted outside of holding time where some IDAs were in control and some were still below the recommended limit. The associated target analytes are ND in both extractions. IDAs with recoveries significantly below limits in the original extraction were reported from both sets of data. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample except for the IDA compound d9-N-EtFOSE-M which was less than 10:1 signal to noise in the original extraction. In the re-extraction this IDA was in control. The associated target analyte is ND in both extractions. For this IDA and the associated target analyte, NEtFOSE, results are reported from both extractions.

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery of d-N-EtFOSA-M associated with the following sample is below the method recommended limit: POLYMER-2-20210506 (320-73382-11). The sample was re-extracted a dilution outside of holding time with improved results, which were still outside of recommended limits. Both sets of data were reported. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for 13C4 PFBA and d-N-EtFOSA-M: POLYMER-3-20210506 (320-73382-12). The sample was re-extracted outside of holding time and the IDAs were in control. The associated target analytes are ND in both extractions. d-N-EtFOSA-M is significantly below limits in the original extraction, therefore, both sets of data were reported for the associated target analyte. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Method 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for several IDA in the following samples: POLYMER-3-20210506 (320-73382-12) and DUP04-20210506 (320-73382-16). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries. The sample was re-analyzed with concurring results, therefore, the data was reported.

Method 537 (modified): Several Isotope Dilution Analyte (IDA) recoveries associated with the following sample are below the method recommended limit: DUP01-20210506 (320-73382-13). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample. The sample was re-analyzed with concurring results, therefore, the data was reported.

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for 13C4 PFBA and d-N-EtFOSA-M: DUP04-20210506 (320-73382-16). The sample was re-extracted outside of holding time and the IDAs were in control. The associated target analytes are ND in both extractions. d-N-EtFOSA-M and 13C4 PFBA are significantly below limits in the original extraction, therefore, both sets of data were reported for the associated target analytes. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

Method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-487831.

Method 3535: The following samples were light brown with particulates in the sample bottle prior to extraction: INFLUENT-02-20210506 (320-73382-1), INFLUENT-07-20210506 (320-73382-2), INFLUENT-08-20210506 (320-73382-3), INFLUENT-11-20210506 (320-73382-4), INFLUENT-18-20210506 (320-73382-5) and EFFLUENT-PERM-20210506 (320-73382-6). preparation batch 320-487831

Method 3535: During the solid phase extraction process, the following samples contain non-settable particulates which clogged the solid phase extraction column: INFLUENT-02-20210506 (320-73382-1), INFLUENT-07-20210506 (320-73382-2), INFLUENT-08-20210506 (320-73382-3), INFLUENT-11-20210506 (320-73382-4) and INFLUENT-18-20210506 (320-73382-5).

Case Narrative

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Job ID: 320-73382-1 (Continued)

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

preparation batch 320-487831

Method 3535: The following samples are light yellow after extraction and final volume: INFLUENT-02-20210506 (320-73382-1), INFLUENT-07-20210506 (320-73382-2), INFLUENT-08-20210506 (320-73382-3), INFLUENT-11-20210506 (320-73382-4), INFLUENT-18-20210506 (320-73382-5) and EFFLUENT-PERM-20210506 (320-73382-6).

preparation batch 320-487831

Method 3535: The following sample contained floating particulates in the sample bottle prior to extraction: DUP01-20210506 (320-73382-13).

preparation batch 320-488328

Method 3535: The following samples were yellow prior to extraction: DUP01-20210506 (320-73382-13) and DUP02-20210506 (320-73382-14).

preparation batch 320-488328

Method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-488328.

Method 3535: During the solid phase extraction process, the following sample contain non-settable particulates which clogged the solid phase extraction column: DUP01-20210506 (320-73382-13).

preparation batch 320-488328

Method 3535: The following samples were light yellow after extraction/final volume: DUP01-20210506 (320-73382-13) and DUP02-20210506 (320-73382-14).

preparation batch 320-488328

Method SHAKE: The following sample are yellow after extraction/final volume: BIOSOLIDS-A-20210506 (320-73382-7), BIOSOLIDS-B-20210506 (320-73382-8), DUP03-20210506 (320-73382-15), (320-73382-A-7 MS) and (320-73382-A-7 MSD).

preparation batch 320-488275

Method Dispersion Prep: The following samples were white cloudy after final extraction/volume. POLYMER-1-20210506 (320-73382-10), POLYMER-2-20210506 (320-73382-11), POLYMER-3-20210506 (320-73382-12) and DUP04-20210506 (320-73382-16)

Method Dispersion Prep: Due to the matrix, the following samples POLYMER-1-20210506 (320-73382-10), POLYMER-2-20210506 (320-73382-11), POLYMER-3-20210506 (320-73382-12) and DUP04-20210506 (320-73382-16) were prepared with an LCS/LCSD instead of a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-492151.

Method Dispersion Prep: The following samples POLYMER-1-20210506 (320-73382-10), POLYMER-2-20210506 (320-73382-11), POLYMER-3-20210506 (320-73382-12) and DUP04-20210506 (320-73382-16) in preparation batch 320-492151 were observed to be white and opaque in color after extraction and final voluming.

Method Dispersion Prep: The following sample POLYMER-1-20210506 (320-73382-10), POLYMER-2-20210506 (320-73382-11), POLYMER-3-20210506 (320-73382-12) and DUP04-20210506 (320-73382-16) in preparation batch 320-492151 were re-prepared outside of preparation holding time due to low IDA recoveries.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: INFLUENT-02-20210506

Lab Sample ID: 320-73382-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.6		4.1	1.9	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	3.7		1.6	0.40	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	4.6		1.6	0.47	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.3 J		1.6	0.20	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	3.3		1.6	0.69	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.66 J		1.6	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.8 I		1.6	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	4.9 I		1.6	0.46	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	6.9 I		1.6	0.44	ng/L	1		537 (modified)	Total/NA
NMeFOSE	1.3 J		3.2	1.1	ng/L	1		537 (modified)	Total/NA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.2 J I		1.6	0.32	ng/L	1		537 (modified)	Total/NA
Total Solids	1200		13	5.6	mg/L	1		SM 2540B	Total/NA
Total Suspended Solids	190		20	7.7	mg/L	1		SM 2540D	Total/NA

Client Sample ID: INFLUENT-07-20210506

Lab Sample ID: 320-73382-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	21		4.2	2.0	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	15		1.7	0.41	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	30		1.7	0.49	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.8		1.7	0.21	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	11		1.7	0.72	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.3 J		1.7	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.1 J		1.7	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	5.8		1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.6		1.7	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	6.2 I		1.7	0.45	ng/L	1		537 (modified)	Total/NA
NEtFOSA	1.6 J		1.7	0.73	ng/L	1		537 (modified)	Total/NA
NMeFOSAA	4.6		4.2	1.0	ng/L	1		537 (modified)	Total/NA
NEtFOSAA	2.3 J		4.2	1.1	ng/L	1		537 (modified)	Total/NA
NMeFOSE	4.7		3.4	1.2	ng/L	1		537 (modified)	Total/NA
NEtFOSE	1.0 J		1.7	0.72	ng/L	1		537 (modified)	Total/NA
Total Solids	1400		13	5.6	mg/L	1		SM 2540B	Total/NA
Total Suspended Solids	220		33	13	mg/L	1		SM 2540D	Total/NA

Client Sample ID: INFLUENT-08-20210506

Lab Sample ID: 320-73382-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	5.8		4.2	2.0	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	160		1.7	0.41	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	5.2		1.7	0.49	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.1 J		1.7	0.21	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	2.2		1.7	0.72	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.52 J		1.7	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.48 J		1.7	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.6 J		1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.3 I		1.7	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.6 I		1.7	0.46	ng/L	1		537 (modified)	Total/NA
Perfluoronananesulfonic acid (PFNS)	0.58 J I		1.7	0.31	ng/L	1		537 (modified)	Total/NA
NMeFOSE	2.4 J		3.4	1.2	ng/L	1		537 (modified)	Total/NA
Total Solids	1400		13	5.6	mg/L	1		SM 2540B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Detection Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: INFLUENT-08-20210506 (Continued)

Lab Sample ID: 320-73382-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Suspended Solids	170		33	13	mg/L	1		SM 2540D	Total/NA

Client Sample ID: INFLUENT-11-20210506

Lab Sample ID: 320-73382-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.3	J	4.3	2.1	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	4.1		1.7	0.50	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.82	J	1.7	0.22	ng/L	1		537 (modified)	Total/NA
Perfluoroctanoic acid (PFOA)	2.2		1.7	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.72	J	1.7	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.54	J	1.7	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.2	J	1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.7	I	1.7	0.49	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.5	I	1.7	0.47	ng/L	1		537 (modified)	Total/NA
NMeFOSE	4.4		3.5	1.2	ng/L	1		537 (modified)	Total/NA
Total Solids	1300		13	5.6	mg/L	1		SM 2540B	Total/NA
Total Suspended Solids	230		33	13	mg/L	1		SM 2540D	Total/NA

Client Sample ID: INFLUENT-18-20210506

Lab Sample ID: 320-73382-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	10		4.1	2.0	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PPPeA)	5.6		1.6	0.40	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	8.1		1.6	0.48	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.3		1.6	0.21	ng/L	1		537 (modified)	Total/NA
Perfluoroctanoic acid (PFOA)	7.8		1.6	0.70	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.93	J I	1.6	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.2	J	1.6	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	4.0		1.6	0.16	ng/L	1		537 (modified)	Total/NA
Perfluoropentanesulfonic acid (PPPeS)	1.6		1.6	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	15		1.6	0.47	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.35	J	1.6	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	12		1.6	0.44	ng/L	1		537 (modified)	Total/NA
NEtFOSAA	1.3	J	4.1	1.1	ng/L	1		537 (modified)	Total/NA
NMeFOSE	2.9	J	3.3	1.2	ng/L	1		537 (modified)	Total/NA
NEtFOSE	3.7		1.6	0.70	ng/L	1		537 (modified)	Total/NA
6:2 FTS	3.8	J	4.1	2.1	ng/L	1		537 (modified)	Total/NA
8:2 FTS	0.46	J I	1.6	0.38	ng/L	1		537 (modified)	Total/NA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	3.2	I	1.6	0.33	ng/L	1		537 (modified)	Total/NA
Total Solids	1500		13	5.6	mg/L	1		SM 2540B	Total/NA
Total Suspended Solids	250		33	13	mg/L	1		SM 2540D	Total/NA

Client Sample ID: EFFLUENT-PERM-20210506

Lab Sample ID: 320-73382-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	10		4.4	2.1	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PPPeA)	15		1.8	0.43	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	24		1.8	0.51	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.5		1.8	0.22	ng/L	1		537 (modified)	Total/NA
Perfluoroctanoic acid (PFOA)	9.7		1.8	0.75	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Detection Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: EFFLUENT-PERM-20210506 (Continued)

Lab Sample ID: 320-73382-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	0.81	J	1.8	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.4	J	1.8	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	3.9		1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluoropentanesulfonic acid (PFPeS)	0.54	J	1.8	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.5		1.8	0.50	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.7		1.8	0.47	ng/L	1		537 (modified)	Total/NA
NiMeFOSAA	1.4	J	4.4	1.1	ng/L	1		537 (modified)	Total/NA
Total Solids	1200		10	4.5	mg/L	1		SM 2540B	Total/NA
Total Suspended Solids	6.5		5.0	1.9	mg/L	1		SM 2540D	Total/NA

Client Sample ID: BIOSOLIDS-A-20210506

Lab Sample ID: 320-73382-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.4	J	6.6	0.93	ug/Kg	10	⊗	537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	11	F1	6.6	2.5	ug/Kg	10	⊗	537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	29	F1	6.6	1.4	ug/Kg	10	⊗	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	16	F1	6.6	2.8	ug/Kg	10	⊗	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.3	J F1	6.6	1.2	ug/Kg	10	⊗	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	15	F1	6.6	0.73	ug/Kg	10	⊗	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	5.4	J	6.6	2.2	ug/Kg	10	⊗	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	19	F1	17	6.6	ug/Kg	10	⊗	537 (modified)	Total/NA
Perfluorodecanesulfonic acid (PFDS)	4.6	J F1	6.6	1.3	ug/Kg	10	⊗	537 (modified)	Total/NA
NiMeFOSAA	41	J	66	13	ug/Kg	10	⊗	537 (modified)	Total/NA
NEtFOSAA	14	J F1	66	12	ug/Kg	10	⊗	537 (modified)	Total/NA
NiMeFOSE	9.9	F1	6.6	2.4	ug/Kg	10	⊗	537 (modified)	Total/NA

Client Sample ID: BIOSOLID-B-20210506

Lab Sample ID: 320-73382-8

No Detections.

Client Sample ID: STRUVITE-20210506

Lab Sample ID: 320-73382-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.067	J	0.19	0.040	ug/Kg	1		537 (modified)	Total/NA

Client Sample ID: POLYMER-1-20210506

Lab Sample ID: 320-73382-10

No Detections.

Client Sample ID: POLYMER-2-20210506

Lab Sample ID: 320-73382-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.31	J	0.45	0.063	ug/Kg	1		537 (modified)	Total/NA

Client Sample ID: POLYMER-3-20210506

Lab Sample ID: 320-73382-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.077	J	0.47	0.066	ug/Kg	1		537 (modified)	Total/NA

Client Sample ID: DUP01-20210506

Lab Sample ID: 320-73382-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	5.1		4.2	2.0	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	170		1.7	0.41	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Detection Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: DUP01-20210506 (Continued)

Lab Sample ID: 320-73382-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	4.9	I	1.7	0.49	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.1	J	1.7	0.21	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	2.5		1.7	0.71	ng/L	1		537 (modified)	Total/NA
Perfluoropentanesulfonic acid (PFPeS)	0.28	J	1.7	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.1	I	1.7	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.3		1.7	0.45	ng/L	1		537 (modified)	Total/NA
6:2 FTS	2.8	J	4.2	2.1	ng/L	1		537 (modified)	Total/NA

Client Sample ID: DUP02-20210506

Lab Sample ID: 320-73382-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	11		4.6	2.2	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	17		1.8	0.45	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	22		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.8		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	11		1.8	0.78	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.71	J	1.8	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.5	J	1.8	0.29	ng/L	1		537 (modified)	Total/NA
Perfluoropentanesulfonic acid (PFPeS)	0.91	J	1.8	0.28	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.0		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.7		1.8	0.50	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonamide (FOSA)	2.1		1.8	0.90	ng/L	1		537 (modified)	Total/NA
NMeFOSAA	1.3	J	4.6	1.1	ng/L	1		537 (modified)	Total/NA

Client Sample ID: DUP03-20210506

Lab Sample ID: 320-73382-15

No Detections.

Client Sample ID: DUP04-20210506

Lab Sample ID: 320-73382-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.48	J	1.2	0.47	ug/Kg	1		537 (modified)	Total/NA

Client Sample ID: EB01-20210504

Lab Sample ID: 320-73382-17

No Detections.

Client Sample ID: FB01-20210506

Lab Sample ID: 320-73382-18

No Detections.

Client Sample ID: FB02-20210506

Lab Sample ID: 320-73382-19

No Detections.

Client Sample ID: FB03-20210506

Lab Sample ID: 320-73382-20

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: INFLUENT-02-20210506

Lab Sample ID: 320-73382-1

Matrix: Water

Date Collected: 05/06/21 08:25

Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.6		4.1	1.9	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluoropentanoic acid (PFPeA)	3.7		1.6	0.40	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluorohexanoic acid (PFHxA)	4.6		1.6	0.47	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluoroheptanoic acid (PFHpA)	1.3 J		1.6	0.20	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluorooctanoic acid (PFOA)	3.3		1.6	0.69	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluorononanoic acid (PFNA)	0.66 J		1.6	0.22	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluorodecanoic acid (PFDA)	<0.25		1.6	0.25	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluoroundecanoic acid (PFUnA)	<0.89		1.6	0.89	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluorododecanoic acid (PFDoA)	<0.45		1.6	0.45	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluorotridecanoic acid (PFTriA)	<1.1		1.6	1.1	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluorotetradecanoic acid (PFTeA)	<0.59		1.6	0.59	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluorobutanesulfonic acid (PFBS)	1.8 I		1.6	0.16	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluoropentanesulfonic acid (PFPeS)	<0.24		1.6	0.24	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluorohexanesulfonic acid (PFHxS)	4.9 I		1.6	0.46	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluoroheptanesulfonic Acid (PFHxS)	<0.15		1.6	0.15	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluorooctanesulfonic acid (PFOS)	6.9 I		1.6	0.44	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluoronananesulfonic acid (PFNS)	<0.30		1.6	0.30	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluorodecanesulfonic acid (PFDS)	<0.26		1.6	0.26	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluorododecanesulfonic acid (PFDoS)	<0.79		1.6	0.79	ng/L	05/11/21 04:47	05/12/21 15:11		1
Perfluoroctanesulfonamide (FOSA)	<0.79		1.6	0.79	ng/L	05/11/21 04:47	05/12/21 15:11		1
NEtFOSA	<0.71		1.6	0.71	ng/L	05/11/21 04:47	05/12/21 15:11		1
NMeFOSA	<0.35		1.6	0.35	ng/L	05/11/21 04:47	05/12/21 15:11		1
NMeFOSAA	<0.97		4.1	0.97	ng/L	05/11/21 04:47	05/12/21 15:11		1
NETFOSAA	<1.1		4.1	1.1	ng/L	05/11/21 04:47	05/12/21 15:11		1
NMeFOSE	1.3 J		3.2	1.1	ng/L	05/11/21 04:47	05/12/21 15:11		1
NETFOSE	<0.69		1.6	0.69	ng/L	05/11/21 04:47	05/12/21 15:11		1
4:2 FTS	<0.19		1.6	0.19	ng/L	05/11/21 04:47	05/12/21 15:11		1
6:2 FTS	<2.0		4.1	2.0	ng/L	05/11/21 04:47	05/12/21 15:11		1
8:2 FTS	<0.37		1.6	0.37	ng/L	05/11/21 04:47	05/12/21 15:11		1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.2 J I		1.6	0.32	ng/L	05/11/21 04:47	05/12/21 15:11		1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.2		3.2	1.2	ng/L	05/11/21 04:47	05/12/21 15:11		1
F-53B Major	<0.19		1.6	0.19	ng/L	05/11/21 04:47	05/12/21 15:11		1
F-53B Minor	<0.26		1.6	0.26	ng/L	05/11/21 04:47	05/12/21 15:11		1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>			<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>	
13C4 PFBA	46		25 - 150			05/11/21 04:47	05/12/21 15:11		1
13C5 PFPeA	60		25 - 150			05/11/21 04:47	05/12/21 15:11		1
13C2 PFHxA	56		25 - 150			05/11/21 04:47	05/12/21 15:11		1
13C4 PFHpA	70		25 - 150			05/11/21 04:47	05/12/21 15:11		1
13C4 PFOA	73		25 - 150			05/11/21 04:47	05/12/21 15:11		1
13C5 PFNA	69		25 - 150			05/11/21 04:47	05/12/21 15:11		1
13C2 PFDA	43		25 - 150			05/11/21 04:47	05/12/21 15:11		1
13C2 PFUnA	37		25 - 150			05/11/21 04:47	05/12/21 15:11		1
13C2 PFDoA	21 *5-		25 - 150			05/11/21 04:47	05/12/21 15:11		1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: INFLUENT-02-20210506

Lab Sample ID: 320-73382-1

Matrix: Water

Date Collected: 05/06/21 08:25
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFTeDA	25		25 - 150	05/11/21 04:47	05/12/21 15:11	1
13C3 PFBS	76		25 - 150	05/11/21 04:47	05/12/21 15:11	1
18O2 PFHxS	74		25 - 150	05/11/21 04:47	05/12/21 15:11	1
13C4 PFOS	69		25 - 150	05/11/21 04:47	05/12/21 15:11	1
13C8 FOSA	40		10 - 150	05/11/21 04:47	05/12/21 15:11	1
d3-NMeFOSAA	33		25 - 150	05/11/21 04:47	05/12/21 15:11	1
d5-NEtFOSAA	17	*5-	25 - 150	05/11/21 04:47	05/12/21 15:11	1
d-N-MeFOSA-M	29		10 - 150	05/11/21 04:47	05/12/21 15:11	1
d-N-EtFOSA-M	24		10 - 150	05/11/21 04:47	05/12/21 15:11	1
d7-N-MeFOSE-M	27		10 - 150	05/11/21 04:47	05/12/21 15:11	1
d9-N-EtFOSE-M	21		10 - 150	05/11/21 04:47	05/12/21 15:11	1
M2-4:2 FTS	120		25 - 150	05/11/21 04:47	05/12/21 15:11	1
M2-6:2 FTS	142		25 - 150	05/11/21 04:47	05/12/21 15:11	1
M2-8:2 FTS	61		25 - 150	05/11/21 04:47	05/12/21 15:11	1
13C3 HFPO-DA	66		25 - 150	05/11/21 04:47	05/12/21 15:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	1200		13	5.6	mg/L			05/13/21 03:43	1
Total Suspended Solids	190		20	7.7	mg/L			05/12/21 16:31	1

Client Sample ID: INFLUENT-07-20210506

Lab Sample ID: 320-73382-2

Matrix: Water

Date Collected: 05/06/21 08:35
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	21		4.2	2.0	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluoropentanoic acid (PFPeA)	15		1.7	0.41	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluorohexanoic acid (PFHxA)	30		1.7	0.49	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluoroheptanoic acid (PFHpA)	4.8		1.7	0.21	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluorooctanoic acid (PFOA)	11		1.7	0.72	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluorononanoic acid (PFNA)	1.3 J		1.7	0.23	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluorodecanoic acid (PFDA)	1.1 J		1.7	0.26	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluoroundecanoic acid (PFUnA)	<0.93		1.7	0.93	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluorododecanoic acid (PFDoA)	<0.46		1.7	0.46	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluorotridecanoic acid (PFTriA)	<1.1		1.7	1.1	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluorotetradecanoic acid (PFTeA)	<0.61		1.7	0.61	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluorobutanesulfonic acid (PFBS)	5.8		1.7	0.17	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluoropentanesulfonic acid (PFPeS)	<0.25		1.7	0.25	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluorohexanesulfonic acid (PFHxS)	7.6		1.7	0.48	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.16		1.7	0.16	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluorooctanesulfonic acid (PFOS)	6.2 I		1.7	0.45	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluoronananesulfonic acid (PFNS)	<0.31		1.7	0.31	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluorodecanesulfonic acid (PFDS)	<0.27		1.7	0.27	ng/L		05/11/21 04:47	05/12/21 15:20	1
Perfluorododecanesulfonic acid (PFDoS)	<0.82		1.7	0.82	ng/L		05/11/21 04:47	05/12/21 15:20	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: INFLUENT-07-20210506

Lab Sample ID: 320-73382-2

Matrix: Water

Date Collected: 05/06/21 08:35
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroctanesulfonamide (FOSA)	<0.82		1.7	0.82	ng/L		05/11/21 04:47	05/12/21 15:20	1
N<i>Et</i>FOSA	1.6 J		1.7	0.73	ng/L		05/11/21 04:47	05/12/21 15:20	1
N <i>Me</i> FOSA	<0.36		1.7	0.36	ng/L		05/11/21 04:47	05/12/21 15:20	1
N<i>Me</i>FOSAA	4.6		4.2	1.0	ng/L		05/11/21 04:47	05/12/21 15:20	1
N<i>Et</i>FOSAA	2.3 J		4.2	1.1	ng/L		05/11/21 04:47	05/12/21 15:20	1
N<i>Me</i>FOSE	4.7		3.4	1.2	ng/L		05/11/21 04:47	05/12/21 15:20	1
N<i>Et</i>FOSE	1.0 J		1.7	0.72	ng/L		05/11/21 04:47	05/12/21 15:20	1
4:2 FTS	<0.20		1.7	0.20	ng/L		05/11/21 04:47	05/12/21 15:20	1
6:2 FTS	<2.1		4.2	2.1	ng/L		05/11/21 04:47	05/12/21 15:20	1
8:2 FTS	<0.39		1.7	0.39	ng/L		05/11/21 04:47	05/12/21 15:20	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.34		1.7	0.34	ng/L		05/11/21 04:47	05/12/21 15:20	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.3		3.4	1.3	ng/L		05/11/21 04:47	05/12/21 15:20	1
F-53B Major	<0.20		1.7	0.20	ng/L		05/11/21 04:47	05/12/21 15:20	1
F-53B Minor	<0.27		1.7	0.27	ng/L		05/11/21 04:47	05/12/21 15:20	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	48		25 - 150				05/11/21 04:47	05/12/21 15:20	1
13C5 PFPeA	63		25 - 150				05/11/21 04:47	05/12/21 15:20	1
13C2 PFHxA	64		25 - 150				05/11/21 04:47	05/12/21 15:20	1
13C4 PFHpA	77		25 - 150				05/11/21 04:47	05/12/21 15:20	1
13C4 PFOA	78		25 - 150				05/11/21 04:47	05/12/21 15:20	1
13C5 PFNA	73		25 - 150				05/11/21 04:47	05/12/21 15:20	1
13C2 PFDA	49		25 - 150				05/11/21 04:47	05/12/21 15:20	1
13C2 PFUnA	40		25 - 150				05/11/21 04:47	05/12/21 15:20	1
13C2 PFDmA	21 *5-		25 - 150				05/11/21 04:47	05/12/21 15:20	1
13C2 PFTeDA	23 *5-		25 - 150				05/11/21 04:47	05/12/21 15:20	1
13C3 PFBS	74		25 - 150				05/11/21 04:47	05/12/21 15:20	1
18O2 PFHxS	84		25 - 150				05/11/21 04:47	05/12/21 15:20	1
13C4 PFOS	78		25 - 150				05/11/21 04:47	05/12/21 15:20	1
13C8 FOSA	45		10 - 150				05/11/21 04:47	05/12/21 15:20	1
d3-N <i>Me</i> FOSAA	35		25 - 150				05/11/21 04:47	05/12/21 15:20	1
d5-N <i>Et</i> FOSAA	18 *5-		25 - 150				05/11/21 04:47	05/12/21 15:20	1
d-N-MeFOSA-M	32		10 - 150				05/11/21 04:47	05/12/21 15:20	1
d-N-EtFOSA-M	26		10 - 150				05/11/21 04:47	05/12/21 15:20	1
d7-N-MeFOSE-M	28		10 - 150				05/11/21 04:47	05/12/21 15:20	1
d9-N-EtFOSE-M	20		10 - 150				05/11/21 04:47	05/12/21 15:20	1
M2-4:2 FTS	141		25 - 150				05/11/21 04:47	05/12/21 15:20	1
M2-6:2 FTS	146		25 - 150				05/11/21 04:47	05/12/21 15:20	1
M2-8:2 FTS	65		25 - 150				05/11/21 04:47	05/12/21 15:20	1
13C3 HFPO-DA	73		25 - 150				05/11/21 04:47	05/12/21 15:20	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	1400		13	5.6	mg/L			05/13/21 03:45	1
Total Suspended Solids	220		33	13	mg/L			05/12/21 16:33	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: INFLUENT-08-20210506

Lab Sample ID: 320-73382-3

Matrix: Water

Date Collected: 05/06/21 08:43

Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	5.8		4.2	2.0	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluoropentanoic acid (PFPeA)	160		1.7	0.41	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluorohexanoic acid (PFHxA)	5.2		1.7	0.49	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluoroheptanoic acid (PFHpA)	1.1 J		1.7	0.21	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluorooctanoic acid (PFOA)	2.2		1.7	0.72	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluorononanoic acid (PFNA)	0.52 J		1.7	0.23	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluorodecanoic acid (PFDA)	0.48 J		1.7	0.26	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluoroundecanoic acid (PFUnA)	<0.93		1.7	0.93	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluorododecanoic acid (PFDa)	<0.47		1.7	0.47	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluorotridecanoic acid (PFTriA)	<1.1		1.7	1.1	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluorotetradecanoic acid (PFTeA)	<0.62		1.7	0.62	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluorobutanesulfonic acid (PFBS)	1.6 J		1.7	0.17	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluoropentanesulfonic acid (PFPeS)	<0.25		1.7	0.25	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluorohexanesulfonic acid (PFHxS)	3.3 I		1.7	0.48	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluoroheptanesulfonic Acid (PFHxP)	<0.16		1.7	0.16	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluoroctanesulfonic acid (PFOS)	2.6 I		1.7	0.46	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluorononanesulfonic acid (PFNS)	0.58 J I		1.7	0.31	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluorodecanesulfonic acid (PFDS)	<0.27		1.7	0.27	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluorododecanesulfonic acid (PFDaS)	<0.82		1.7	0.82	ng/L	05/11/21 04:47	05/12/21 15:29		1
Perfluorooctanesulfonamide (FOSA)	<0.83		1.7	0.83	ng/L	05/11/21 04:47	05/12/21 15:29		1
NEtFOSA	<0.74		1.7	0.74	ng/L	05/11/21 04:47	05/12/21 15:29		1
NMeFOSA	<0.36		1.7	0.36	ng/L	05/11/21 04:47	05/12/21 15:29		1
NMeFOSAA	<1.0		4.2	1.0	ng/L	05/11/21 04:47	05/12/21 15:29		1
NEtFOSAA	<1.1		4.2	1.1	ng/L	05/11/21 04:47	05/12/21 15:29		1
NMeFOSE	2.4 J		3.4	1.2	ng/L	05/11/21 04:47	05/12/21 15:29		1
NEtFOSE	<0.72		1.7	0.72	ng/L	05/11/21 04:47	05/12/21 15:29		1
4:2 FTS	<0.20		1.7	0.20	ng/L	05/11/21 04:47	05/12/21 15:29		1
6:2 FTS	<2.1		4.2	2.1	ng/L	05/11/21 04:47	05/12/21 15:29		1
8:2 FTS	<0.39		1.7	0.39	ng/L	05/11/21 04:47	05/12/21 15:29		1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.34		1.7	0.34	ng/L	05/11/21 04:47	05/12/21 15:29		1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.3		3.4	1.3	ng/L	05/11/21 04:47	05/12/21 15:29		1
F-53B Major	<0.20		1.7	0.20	ng/L	05/11/21 04:47	05/12/21 15:29		1
F-53B Minor	<0.27		1.7	0.27	ng/L	05/11/21 04:47	05/12/21 15:29		1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
13C4 PFBA	46		25 - 150			05/11/21 04:47	05/12/21 15:29		1
13C5 PFPeA	59		25 - 150			05/11/21 04:47	05/12/21 15:29		1
13C2 PFHxA	62		25 - 150			05/11/21 04:47	05/12/21 15:29		1
13C4 PFHpA	72		25 - 150			05/11/21 04:47	05/12/21 15:29		1
13C4 PFOA	73		25 - 150			05/11/21 04:47	05/12/21 15:29		1
13C5 PFNA	68		25 - 150			05/11/21 04:47	05/12/21 15:29		1
13C2 PFDA	43		25 - 150			05/11/21 04:47	05/12/21 15:29		1
13C2 PFUnA	33		25 - 150			05/11/21 04:47	05/12/21 15:29		1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.

Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: INFLUENT-08-20210506

Date Collected: 05/06/21 08:43

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-3

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	20	*5-	25 - 150	05/11/21 04:47	05/12/21 15:29	1
13C2 PFTeDA	25		25 - 150	05/11/21 04:47	05/12/21 15:29	1
13C3 PFBS	71		25 - 150	05/11/21 04:47	05/12/21 15:29	1
18O2 PFHxS	72		25 - 150	05/11/21 04:47	05/12/21 15:29	1
13C4 PFOS	68		25 - 150	05/11/21 04:47	05/12/21 15:29	1
13C8 FOSA	39		10 - 150	05/11/21 04:47	05/12/21 15:29	1
d3-NMeFOSAA	27		25 - 150	05/11/21 04:47	05/12/21 15:29	1
d5-NEtFOSAA	15	*5-	25 - 150	05/11/21 04:47	05/12/21 15:29	1
d-N-MeFOSA-M	28		10 - 150	05/11/21 04:47	05/12/21 15:29	1
d-N-EtFOSA-M	21		10 - 150	05/11/21 04:47	05/12/21 15:29	1
d7-N-MeFOSE-M	29		10 - 150	05/11/21 04:47	05/12/21 15:29	1
d9-N-EtFOSE-M	18		10 - 150	05/11/21 04:47	05/12/21 15:29	1
M2-4:2 FTS	137		25 - 150	05/11/21 04:47	05/12/21 15:29	1
M2-6:2 FTS	122		25 - 150	05/11/21 04:47	05/12/21 15:29	1
M2-8:2 FTS	54		25 - 150	05/11/21 04:47	05/12/21 15:29	1
13C3 HFPO-DA	65		25 - 150	05/11/21 04:47	05/12/21 15:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	1400		13	5.6	mg/L			05/13/21 03:47	1
Total Suspended Solids	170		33	13	mg/L			05/12/21 16:34	1

Client Sample ID: INFLUENT-11-20210506

Lab Sample ID: 320-73382-4

Matrix: Water

Date Collected: 05/06/21 08:47

Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	3.3	J	4.3	2.1	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluoropentanoic acid (PFPeA)	<0.42		1.7	0.42	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluorohexanoic acid (PFHxA)	4.1		1.7	0.50	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluoroheptanoic acid (PFHpA)	0.82	J	1.7	0.22	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluorooctanoic acid (PFOA)	2.2		1.7	0.74	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluorononanoic acid (PFNA)	0.72	J	1.7	0.23	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluorodecanoic acid (PFDA)	0.54	J	1.7	0.27	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluoroundecanoic acid (PFUnA)	<0.95		1.7	0.95	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluorododecanoic acid (PFDoA)	<0.48		1.7	0.48	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluorotridecanoic acid (PFTriA)	<1.1		1.7	1.1	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluorotetradecanoic acid (PFTeA)	<0.63		1.7	0.63	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluorobutanesulfonic acid (PFBS)	1.2	J	1.7	0.17	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluoropentanesulfonic acid (PFPeS)	<0.26		1.7	0.26	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluorohexanesulfonic acid (PFHxS)	2.7	I	1.7	0.49	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.16		1.7	0.16	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluorooctanesulfonic acid (PFOS)	3.5	I	1.7	0.47	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluoronananesulfonic acid (PFNS)	<0.32		1.7	0.32	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluorodecanesulfonic acid (PFDS)	<0.28		1.7	0.28	ng/L		05/11/21 04:47	05/12/21 15:39	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: INFLUENT-11-20210506

Lab Sample ID: 320-73382-4

Matrix: Water

Date Collected: 05/06/21 08:47

Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanesulfonic acid (PFDoS)	<0.84		1.7	0.84	ng/L		05/11/21 04:47	05/12/21 15:39	1
Perfluoroctanesulfonamide (FOSA)	<0.85		1.7	0.85	ng/L		05/11/21 04:47	05/12/21 15:39	1
NEtFOSA	<0.75		1.7	0.75	ng/L		05/11/21 04:47	05/12/21 15:39	1
NMeFOSA	<0.37		1.7	0.37	ng/L		05/11/21 04:47	05/12/21 15:39	1
NMeFOSAA	<1.0		4.3	1.0	ng/L		05/11/21 04:47	05/12/21 15:39	1
NETFOSAA	<1.1		4.3	1.1	ng/L		05/11/21 04:47	05/12/21 15:39	1
NMeFOSE	4.4		3.5	1.2	ng/L		05/11/21 04:47	05/12/21 15:39	1
NETFOSE	<0.74		1.7	0.74	ng/L		05/11/21 04:47	05/12/21 15:39	1
4:2 FTS	<0.21		1.7	0.21	ng/L		05/11/21 04:47	05/12/21 15:39	1
6:2 FTS	<2.2		4.3	2.2	ng/L		05/11/21 04:47	05/12/21 15:39	1
8:2 FTS	<0.40		1.7	0.40	ng/L		05/11/21 04:47	05/12/21 15:39	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.35		1.7	0.35	ng/L		05/11/21 04:47	05/12/21 15:39	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.3		3.5	1.3	ng/L		05/11/21 04:47	05/12/21 15:39	1
F-53B Major	<0.21		1.7	0.21	ng/L		05/11/21 04:47	05/12/21 15:39	1
F-53B Minor	<0.28		1.7	0.28	ng/L		05/11/21 04:47	05/12/21 15:39	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	41		25 - 150				05/11/21 04:47	05/12/21 15:39	1
13C5 PFPeA	54		25 - 150				05/11/21 04:47	05/12/21 15:39	1
13C2 PFHxA	51		25 - 150				05/11/21 04:47	05/12/21 15:39	1
13C4 PFHpA	62		25 - 150				05/11/21 04:47	05/12/21 15:39	1
13C4 PFOA	61		25 - 150				05/11/21 04:47	05/12/21 15:39	1
13C5 PFNA	55		25 - 150				05/11/21 04:47	05/12/21 15:39	1
13C2 PFDA	33		25 - 150				05/11/21 04:47	05/12/21 15:39	1
13C2 PFUnA	28		25 - 150				05/11/21 04:47	05/12/21 15:39	1
13C2 PFDaA	15 *5-		25 - 150				05/11/21 04:47	05/12/21 15:39	1
13C2 PFTeDA	17 *5-		25 - 150				05/11/21 04:47	05/12/21 15:39	1
13C3 PFBS	60		25 - 150				05/11/21 04:47	05/12/21 15:39	1
18O2 PFHxS	62		25 - 150				05/11/21 04:47	05/12/21 15:39	1
13C4 PFOS	56		25 - 150				05/11/21 04:47	05/12/21 15:39	1
13C8 FOSA	27		10 - 150				05/11/21 04:47	05/12/21 15:39	1
d3-NMeFOSAA	21 *5-		25 - 150				05/11/21 04:47	05/12/21 15:39	1
d5-NEtFOSAA	11 *5-		25 - 150				05/11/21 04:47	05/12/21 15:39	1
d-N-MeFOSA-M	20		10 - 150				05/11/21 04:47	05/12/21 15:39	1
d-N-EtFOSA-M	17		10 - 150				05/11/21 04:47	05/12/21 15:39	1
d7-N-MeFOSE-M	21		10 - 150				05/11/21 04:47	05/12/21 15:39	1
d9-N-EtFOSE-M	16		10 - 150				05/11/21 04:47	05/12/21 15:39	1
M2-4:2 FTS	140		25 - 150				05/11/21 04:47	05/12/21 15:39	1
M2-6:2 FTS	122		25 - 150				05/11/21 04:47	05/12/21 15:39	1
M2-8:2 FTS	51		25 - 150				05/11/21 04:47	05/12/21 15:39	1
13C3 HFPO-DA	54		25 - 150				05/11/21 04:47	05/12/21 15:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	1300		13	5.6	mg/L			05/13/21 03:49	1
Total Suspended Solids	230		33	13	mg/L			05/12/21 16:35	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: INFLUENT-18-20210506

Lab Sample ID: 320-73382-5

Matrix: Water

Date Collected: 05/06/21 08:53
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	10		4.1	2.0	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluoropentanoic acid (PFPeA)	5.6		1.6	0.40	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluorohexanoic acid (PFHxA)	8.1		1.6	0.48	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluoroheptanoic acid (PFHpA)	2.3		1.6	0.21	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluorooctanoic acid (PFOA)	7.8		1.6	0.70	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluorononanoic acid (PFNA)	0.93 J I		1.6	0.22	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluorodecanoic acid (PFDA)	1.2 J		1.6	0.25	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluoroundecanoic acid (PFUnA)	<0.90		1.6	0.90	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluorododecanoic acid (PFDoA)	<0.45		1.6	0.45	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluorotridecanoic acid (PFTriA)	<1.1		1.6	1.1	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluorotetradecanoic acid (PFTeA)	<0.60		1.6	0.60	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluorobutanesulfonic acid (PFBS)	4.0		1.6	0.16	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluoropentanesulfonic acid (PFPeS)	1.6		1.6	0.25	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluorohexanesulfonic acid (PFHxS)	15		1.6	0.47	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluoroheptanesulfonic Acid (PFHpS)	0.35 J		1.6	0.16	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluorooctanesulfonic acid (PFOS)	12		1.6	0.44	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluorononanesulfonic acid (PFNS)	<0.30		1.6	0.30	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluorodecanesulfonic acid (PFDS)	<0.26		1.6	0.26	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluorododecanesulfonic acid (PFDoS)	<0.80		1.6	0.80	ng/L	05/11/21 04:47	05/12/21 06:07		1
Perfluoroctanesulfonamide (FOSA)	<0.81		1.6	0.81	ng/L	05/11/21 04:47	05/12/21 06:07		1
NEtFOSA	<0.71		1.6	0.71	ng/L	05/11/21 04:47	05/12/21 06:07		1
NMeFOSA	<0.35		1.6	0.35	ng/L	05/11/21 04:47	05/12/21 06:07		1
NMeFOSAA	<0.99		4.1	0.99	ng/L	05/11/21 04:47	05/12/21 06:07		1
NEtFOSAA	1.3 J		4.1	1.1	ng/L	05/11/21 04:47	05/12/21 06:07		1
NMeFOSE	2.9 J		3.3	1.2	ng/L	05/11/21 04:47	05/12/21 06:07		1
NEtFOSE	3.7		1.6	0.70	ng/L	05/11/21 04:47	05/12/21 06:07		1
4:2 FTS	<0.20		1.6	0.20	ng/L	05/11/21 04:47	05/12/21 06:07		1
6:2 FTS	3.8 J		4.1	2.1	ng/L	05/11/21 04:47	05/12/21 06:07		1
8:2 FTS	0.46 J I		1.6	0.38	ng/L	05/11/21 04:47	05/12/21 06:07		1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	3.2 I		1.6	0.33	ng/L	05/11/21 04:47	05/12/21 06:07		1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.2		3.3	1.2	ng/L	05/11/21 04:47	05/12/21 06:07		1
F-53B Major	<0.20		1.6	0.20	ng/L	05/11/21 04:47	05/12/21 06:07		1
F-53B Minor	<0.26		1.6	0.26	ng/L	05/11/21 04:47	05/12/21 06:07		1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
13C4 PFBA	45		25 - 150			05/11/21 04:47	05/12/21 06:07		1
13C5 PFPeA	59		25 - 150			05/11/21 04:47	05/12/21 06:07		1
13C2 PFHxA	35		25 - 150			05/11/21 04:47	05/12/21 06:07		1
13C4 PFHpA	63		25 - 150			05/11/21 04:47	05/12/21 06:07		1
13C4 PFOA	62		25 - 150			05/11/21 04:47	05/12/21 06:07		1
13C5 PFNA	60		25 - 150			05/11/21 04:47	05/12/21 06:07		1
13C2 PFDA	41		25 - 150			05/11/21 04:47	05/12/21 06:07		1
13C2 PFUnA	36		25 - 150			05/11/21 04:47	05/12/21 06:07		1
13C2 PFDoA	22 *5-		25 - 150			05/11/21 04:47	05/12/21 06:07		1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: INFLUENT-18-20210506

Lab Sample ID: 320-73382-5

Matrix: Water

Date Collected: 05/06/21 08:53
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFTeDA	25		25 - 150	05/11/21 04:47	05/12/21 06:07	1
13C3 PFBS	66		25 - 150	05/11/21 04:47	05/12/21 06:07	1
18O2 PFHxS	72		25 - 150	05/11/21 04:47	05/12/21 06:07	1
13C4 PFOS	65		25 - 150	05/11/21 04:47	05/12/21 06:07	1
13C8 FOSA	34		10 - 150	05/11/21 04:47	05/12/21 06:07	1
d3-NMeFOSAA	37		25 - 150	05/11/21 04:47	05/12/21 06:07	1
d5-NEtFOSAA	16	*5-	25 - 150	05/11/21 04:47	05/12/21 06:07	1
d-N-MeFOSA-M	28		10 - 150	05/11/21 04:47	05/12/21 06:07	1
d-N-EtFOSA-M	29		10 - 150	05/11/21 04:47	05/12/21 06:07	1
d7-N-MeFOSE-M	24		10 - 150	05/11/21 04:47	05/12/21 06:07	1
d9-N-EtFOSE-M	27		10 - 150	05/11/21 04:47	05/12/21 06:07	1
M2-4:2 FTS	86		25 - 150	05/11/21 04:47	05/12/21 06:07	1
M2-6:2 FTS	137		25 - 150	05/11/21 04:47	05/12/21 06:07	1
M2-8:2 FTS	69		25 - 150	05/11/21 04:47	05/12/21 06:07	1
13C3 HFPO-DA	61		25 - 150	05/11/21 04:47	05/12/21 06:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	1500		13	5.6	mg/L			05/13/21 03:51	1
Total Suspended Solids	250		33	13	mg/L			05/12/21 16:37	1

Client Sample ID: EFFLUENT-PERM-20210506

Lab Sample ID: 320-73382-6

Matrix: Water

Date Collected: 05/06/21 09:00

Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	10		4.4	2.1	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluoropentanoic acid (PFPeA)	15		1.8	0.43	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluorohexanoic acid (PFHxA)	24		1.8	0.51	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluoroheptanoic acid (PFHpA)	3.5		1.8	0.22	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluorooctanoic acid (PFOA)	9.7		1.8	0.75	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluorononanoic acid (PFNA)	0.81 J		1.8	0.24	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluorodecanoic acid (PFDA)	1.4 J		1.8	0.27	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluoroundecanoic acid (PFUnA)	<0.96		1.8	0.96	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluorododecanoic acid (PFDoA)	<0.48		1.8	0.48	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluorotridecanoic acid (PFTriA)	<1.1		1.8	1.1	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluorotetradecanoic acid (PFTeA)	<0.64		1.8	0.64	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluorobutanesulfonic acid (PFBS)	3.9		1.8	0.18	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluoropentanesulfonic acid (PFPeS)	0.54 J		1.8	0.26	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluorohexanesulfonic acid (PFHxS)	7.5		1.8	0.50	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.17		1.8	0.17	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluorooctanesulfonic acid (PFOS)	3.7		1.8	0.47	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluoronananesulfonic acid (PFNS)	<0.32		1.8	0.32	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluorodecanesulfonic acid (PFDS)	<0.28		1.8	0.28	ng/L		05/11/21 04:47	05/12/21 06:16	1
Perfluorododecanesulfonic acid (PFDoS)	<0.85		1.8	0.85	ng/L		05/11/21 04:47	05/12/21 06:16	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: EFFLUENT-PERM-20210506

Lab Sample ID: 320-73382-6

Matrix: Water

Date Collected: 05/06/21 09:00

Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroctanesulfonamide (FOSA)	<0.86		1.8	0.86	ng/L	05/11/21 04:47	05/12/21 06:16		1
NEtFOSA	<0.76		1.8	0.76	ng/L	05/11/21 04:47	05/12/21 06:16		1
NMeFOSA	<0.38		1.8	0.38	ng/L	05/11/21 04:47	05/12/21 06:16		1
NMeFOSAA	1.4 J		4.4	1.1	ng/L	05/11/21 04:47	05/12/21 06:16		1
NEtFOSAA	<1.1		4.4	1.1	ng/L	05/11/21 04:47	05/12/21 06:16		1
NMeFOSE	<1.2		3.5	1.2	ng/L	05/11/21 04:47	05/12/21 06:16		1
NEtFOSE	<0.75		1.8	0.75	ng/L	05/11/21 04:47	05/12/21 06:16		1
4:2 FTS	<0.21		1.8	0.21	ng/L	05/11/21 04:47	05/12/21 06:16		1
6:2 FTS	<2.2		4.4	2.2	ng/L	05/11/21 04:47	05/12/21 06:16		1
8:2 FTS	<0.40		1.8	0.40	ng/L	05/11/21 04:47	05/12/21 06:16		1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.35		1.8	0.35	ng/L	05/11/21 04:47	05/12/21 06:16		1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.3		3.5	1.3	ng/L	05/11/21 04:47	05/12/21 06:16		1
F-53B Major	<0.21		1.8	0.21	ng/L	05/11/21 04:47	05/12/21 06:16		1
F-53B Minor	<0.28		1.8	0.28	ng/L	05/11/21 04:47	05/12/21 06:16		1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	13
13C4 PFBA	46		25 - 150			05/11/21 04:47	05/12/21 06:16		1
13C5 PFPeA	55		25 - 150			05/11/21 04:47	05/12/21 06:16		1
13C2 PFHxA	65		25 - 150			05/11/21 04:47	05/12/21 06:16		1
13C4 PFHpA	63		25 - 150			05/11/21 04:47	05/12/21 06:16		1
13C4 PFOA	65		25 - 150			05/11/21 04:47	05/12/21 06:16		1
13C5 PFNA	69		25 - 150			05/11/21 04:47	05/12/21 06:16		1
13C2 PFDA	64		25 - 150			05/11/21 04:47	05/12/21 06:16		1
13C2 PFUnA	66		25 - 150			05/11/21 04:47	05/12/21 06:16		1
13C2 PFDmA	59		25 - 150			05/11/21 04:47	05/12/21 06:16		1
13C2 PFTeDA	38		25 - 150			05/11/21 04:47	05/12/21 06:16		1
13C3 PFBS	68		25 - 150			05/11/21 04:47	05/12/21 06:16		1
18O2 PFHxS	71		25 - 150			05/11/21 04:47	05/12/21 06:16		1
13C4 PFOS	68		25 - 150			05/11/21 04:47	05/12/21 06:16		1
13C8 FOSA	69		10 - 150			05/11/21 04:47	05/12/21 06:16		1
d3-NMeFOSAA	66		25 - 150			05/11/21 04:47	05/12/21 06:16		1
d5-NEtFOSAA	66		25 - 150			05/11/21 04:47	05/12/21 06:16		1
d-N-MeFOSA-M	61		10 - 150			05/11/21 04:47	05/12/21 06:16		1
d-N-EtFOSA-M	58		10 - 150			05/11/21 04:47	05/12/21 06:16		1
d7-N-MeFOSE-M	60		10 - 150			05/11/21 04:47	05/12/21 06:16		1
d9-N-EtFOSE-M	61		10 - 150			05/11/21 04:47	05/12/21 06:16		1
M2-4:2 FTS	127		25 - 150			05/11/21 04:47	05/12/21 06:16		1
M2-6:2 FTS	113		25 - 150			05/11/21 04:47	05/12/21 06:16		1
M2-8:2 FTS	85		25 - 150			05/11/21 04:47	05/12/21 06:16		1
13C3 HFPO-DA	59		25 - 150			05/11/21 04:47	05/12/21 06:16		1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	1200		10	4.5	mg/L			05/13/21 03:53	1
Total Suspended Solids	6.5		5.0	1.9	mg/L			05/12/21 16:38	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: BIOSOLIDS-A-20210506

Lab Sample ID: 320-73382-7

Date Collected: 05/06/21 09:31
Date Received: 05/07/21 10:05

Matrix: Solid

Percent Solids: 26.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	3.4	J	6.6	0.93	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluoropentanoic acid (PFPeA)	11	F1	6.6	2.5	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluorohexanoic acid (PFHxA)	29	F1	6.6	1.4	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluoroheptanoic acid (PFHpA)	<0.96	F1	6.6	0.96	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluorooctanoic acid (PFOA)	16	F1	6.6	2.8	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluorononanoic acid (PFNA)	1.3	J F1	6.6	1.2	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluorodecanoic acid (PFDA)	15	F1	6.6	0.73	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluoroundecanoic acid (PFUnA)	<1.2	F1	6.6	1.2	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluorododecanoic acid (PFDoA)	5.4	J	6.6	2.2	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluorotridecanoic acid (PFTriA)	<1.7		6.6	1.7	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluorotetradecanoic acid (PFTeA)	<1.8	F1	6.6	1.8	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluorobutanesulfonic acid (PFBS)	<0.83	F1	6.6	0.83	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluoropentanesulfonic acid (PFPeS)	<0.66		6.6	0.66	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluorohexanesulfonic acid (PFHxS)	<1.0		6.6	1.0	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluoroheptanesulfonic Acid (PFHpS)	<1.2		6.6	1.2	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluorooctanesulfonic acid (PFOS)	19	F1	17	6.6	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluorononanesulfonic acid (PFNS)	<0.66		6.6	0.66	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluorodecanesulfonic acid (PFDS)	4.6	J F1	6.6	1.3	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluorododecanesulfonic acid (PFDoS)	<2.0		6.6	2.0	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Perfluoroctanesulfonamide (FOSA)	<2.7	F1	6.6	2.7	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
NEtFOSA	<0.79	F1	6.6	0.79	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
NMeFOSA	<1.4		6.6	1.4	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
NMeFOSAA	41	J	66	13	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
NEtFOSAA	14	J F1	66	12	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
NMeFOSE	9.9	F1	6.6	2.4	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
NetFOSE	<1.2	F1	6.6	1.2	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
4:2 FTS	<12		66	12	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
6:2 FTS	<5.0	F1	66	5.0	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
8:2 FTS	<8.3		66	8.3	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.60		6.6	0.60	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<3.6	F1	8.3	3.6	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
F-53B Major	<0.89		6.6	0.89	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
F-53B Minor	<0.73		6.6	0.73	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:28	10
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
13C4 PFBA	72		25 - 150			05/12/21 11:27	05/16/21 05:28	10	
13C5 PFPeA	75		25 - 150			05/12/21 11:27	05/16/21 05:28	10	
13C2 PFHxA	73		25 - 150			05/12/21 11:27	05/16/21 05:28	10	
13C4 PFHpA	63		25 - 150			05/12/21 11:27	05/16/21 05:28	10	
13C4 PFOA	77		25 - 150			05/12/21 11:27	05/16/21 05:28	10	
13C5 PFNA	82		25 - 150			05/12/21 11:27	05/16/21 05:28	10	
13C2 PFDA	66		25 - 150			05/12/21 11:27	05/16/21 05:28	10	
13C2 PFUnA	81		25 - 150			05/12/21 11:27	05/16/21 05:28	10	
13C2 PFDoA	53		25 - 150			05/12/21 11:27	05/16/21 05:28	10	

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: BIOSOLIDS-A-20210506

Date Collected: 05/06/21 09:31
Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-7

Matrix: Solid

Percent Solids: 26.5

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFTeDA	31		25 - 150	05/12/21 11:27	05/16/21 05:28	10
13C3 PFBS	67		25 - 150	05/12/21 11:27	05/16/21 05:28	10
18O2 PFHxS	65		25 - 150	05/12/21 11:27	05/16/21 05:28	10
13C4 PFOS	68		25 - 150	05/12/21 11:27	05/16/21 05:28	10
13C8 FOSA	67		10 - 150	05/12/21 11:27	05/16/21 05:28	10
d3-NMeFOSAA	63		25 - 150	05/12/21 11:27	05/16/21 05:28	10
d5-NEtFOSAA	65		25 - 150	05/12/21 11:27	05/16/21 05:28	10
d-N-MeFOSA-M	54		10 - 150	05/12/21 11:27	05/16/21 05:28	10
d-N-EtFOSA-M	37		10 - 150	05/12/21 11:27	05/16/21 05:28	10
d7-N-MeFOSE-M	59		10 - 150	05/12/21 11:27	05/16/21 05:28	10
d9-N-EtFOSE-M	37		10 - 150	05/12/21 11:27	05/16/21 05:28	10
M2-4:2 FTS	93		25 - 150	05/12/21 11:27	05/16/21 05:28	10
M2-6:2 FTS	113		25 - 150	05/12/21 11:27	05/16/21 05:28	10
M2-8:2 FTS	137		25 - 150	05/12/21 11:27	05/16/21 05:28	10
13C3 HFPO-DA	52		25 - 150	05/12/21 11:27	05/16/21 05:28	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	73.5		0.1	0.1	%			05/12/21 11:57	1
Percent Solids	26.5		0.1	0.1	%			05/12/21 11:57	1

Client Sample ID: BIOSOLIDS-B-20210506

Date Collected: 05/06/21 10:55
Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-8

Matrix: Solid

Percent Solids: 5.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<4.7		33	4.7	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluoropentanoic acid (PFPeA)	<13		33	13	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluorohexanoic acid (PFHxA)	<7.0		33	7.0	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluoroheptanoic acid (PFHpA)	<4.8		33	4.8	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluorooctanoic acid (PFOA)	<14		33	14	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluorononanoic acid (PFNA)	<6.0		33	6.0	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluorodecanoic acid (PFDA)	<3.7		33	3.7	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluoroundecanoic acid (PFUnA)	<6.0		33	6.0	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluorododecanoic acid (PFDaO)	<11		33	11	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluorotridecanoic acid (PFTriA)	<8.5		33	8.5	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluorotetradecanoic acid (PFTeA)	<9.0		33	9.0	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluorobutanesulfonic acid (PFBS)	<4.2		33	4.2	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluoropentanesulfonic acid (PFPeS)	<3.3		33	3.3	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluorohexanesulfonic acid (PFHxS)	<5.2		33	5.2	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluoroheptanesulfonic Acid (PFHpS)	<5.9		33	5.9	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluoroctanesulfonic acid (PFOS)	<33		84	33	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluoronananesulfonic acid (PFNS)	<3.3		33	3.3	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluorodecanesulfonic acid (PFDS)	<6.5		33	6.5	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluorododecanesulfonic acid (PFDaS)	<10		33	10	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Perfluoroctanesulfonamide (FOSA)	<14		33	14	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
NEtFOSA	<4.0		33	4.0	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: BIOSOLIDS-B-20210506

Lab Sample ID: 320-73382-8

Date Collected: 05/06/21 10:55
Date Received: 05/07/21 10:05

Matrix: Solid

Percent Solids: 5.4

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NMeFOSA	<6.9		33	6.9	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
NMeFOSAA	<65		330	65	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
NEtFOSAA	<62		330	62	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
NMeFOSE	<12		33	12	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
NEtFOSE	<6.0		33	6.0	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
4:2 FTS	<62		330	62	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
6:2 FTS	<25		330	25	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
8:2 FTS	<42		330	42	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<3.0		33	3.0	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<18		42	18	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
F-53B Major	<4.5		33	4.5	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
F-53B Minor	<3.7		33	3.7	ug/Kg	⊗	05/12/21 11:27	05/16/21 05:56	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	85		25 - 150				05/12/21 11:27	05/16/21 05:56	10
13C5 PFPeA	71		25 - 150				05/12/21 11:27	05/16/21 05:56	10
13C2 PFHxA	72		25 - 150				05/12/21 11:27	05/16/21 05:56	10
13C4 PFHpA	71		25 - 150				05/12/21 11:27	05/16/21 05:56	10
13C4 PFOA	86		25 - 150				05/12/21 11:27	05/16/21 05:56	10
13C5 PFNA	84		25 - 150				05/12/21 11:27	05/16/21 05:56	10
13C2 PFDA	80		25 - 150				05/12/21 11:27	05/16/21 05:56	10
13C2 PFUnA	85		25 - 150				05/12/21 11:27	05/16/21 05:56	10
13C2 PFDaA	68		25 - 150				05/12/21 11:27	05/16/21 05:56	10
13C2 PFTeDA	44		25 - 150				05/12/21 11:27	05/16/21 05:56	10
13C3 PFBS	71		25 - 150				05/12/21 11:27	05/16/21 05:56	10
18O2 PFHxS	79		25 - 150				05/12/21 11:27	05/16/21 05:56	10
13C4 PFOS	84		25 - 150				05/12/21 11:27	05/16/21 05:56	10
13C8 FOSA	69		10 - 150				05/12/21 11:27	05/16/21 05:56	10
d3-NMeFOSAA	81		25 - 150				05/12/21 11:27	05/16/21 05:56	10
d5-NEtFOSAA	93		25 - 150				05/12/21 11:27	05/16/21 05:56	10
d-N-MeFOSA-M	61		10 - 150				05/12/21 11:27	05/16/21 05:56	10
d-N-EtFOSA-M	57		10 - 150				05/12/21 11:27	05/16/21 05:56	10
d7-N-MeFOSE-M	77		10 - 150				05/12/21 11:27	05/16/21 05:56	10
d9-N-EtFOSE-M	42		10 - 150				05/12/21 11:27	05/16/21 05:56	10
M2-4:2 FTS	91		25 - 150				05/12/21 11:27	05/16/21 05:56	10
M2-6:2 FTS	129		25 - 150				05/12/21 11:27	05/16/21 05:56	10
M2-8:2 FTS	163 *5+		25 - 150				05/12/21 11:27	05/16/21 05:56	10
13C3 HFPO-DA	67		25 - 150				05/12/21 11:27	05/16/21 05:56	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	94.6		0.1	0.1	%			05/12/21 11:57	1
Percent Solids	5.4		0.1	0.1	%			05/12/21 11:57	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: STRUVITE-20210506

Lab Sample ID: 320-73382-9

Matrix: Solid

Date Collected: 05/06/21 10:10

Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.027		0.19	0.027	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluoropentanoic acid (PFPeA)	<0.073		0.19	0.073	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluorohexanoic acid (PFHxA)	0.067 J		0.19	0.040	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluoroheptanoic acid (PFHpA)	<0.028		0.19	0.028	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluoroctanoic acid (PFOA)	<0.082		0.19	0.082	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluorononanoic acid (PFNA)	<0.034		0.19	0.034	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluorodecanoic acid (PFDA)	<0.021		0.19	0.021	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluoroundecanoic acid (PFUnA)	<0.034		0.19	0.034	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluorododecanoic acid (PFDoA)	<0.064		0.19	0.064	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluorotridecanoic acid (PFTriA)	<0.048		0.19	0.048	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluorotetradecanoic acid (PFTeA)	<0.051		0.19	0.051	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluorobutanesulfonic acid (PFBS)	<0.024		0.19	0.024	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluoropentanesulfonic acid (PFPeS)	<0.019		0.19	0.019	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluorohexanesulfonic acid (PFHxS)	<0.029		0.19	0.029	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.033		0.19	0.033	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluoroctanesulfonic acid (PFOS)	<0.19		0.47	0.19	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluorononanesulfonic acid (PFNS)	<0.019		0.19	0.019	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluorodecanesulfonic acid (PFDS)	<0.037		0.19	0.037	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluorododecanesulfonic acid (PFDoS)	<0.057		0.19	0.057	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Perfluoroctanesulfonamide (FOSA)	<0.078		0.19	0.078	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
NEtFOSA	<0.023		0.19	0.023	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
NMeFOSA	<0.039		0.19	0.039	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
NMeFOSAA	<0.37		1.9	0.37	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
NETFOSAA	<0.35		1.9	0.35	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
NMeFOSE	<0.067		0.19	0.067	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
NETFOSE	<0.034		0.19	0.034	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
4:2 FTS	<0.35		1.9	0.35	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
6:2 FTS	<0.14		1.9	0.14	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
8:2 FTS	<0.24		1.9	0.24	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.017		0.19	0.017	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<0.10		0.24	0.10	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
F-53B Major	<0.026		0.19	0.026	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
F-53B Minor	<0.021		0.19	0.021	ug/Kg	05/12/21 11:27	05/14/21 03:53		1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
13C4 PFBA	85		25 - 150			05/12/21 11:27	05/14/21 03:53		1
13C5 PFPeA	67		25 - 150			05/12/21 11:27	05/14/21 03:53		1
13C2 PFHxA	78		25 - 150			05/12/21 11:27	05/14/21 03:53		1
13C4 PFHpA	75		25 - 150			05/12/21 11:27	05/14/21 03:53		1
13C4 PFOA	81		25 - 150			05/12/21 11:27	05/14/21 03:53		1
13C5 PFNA	85		25 - 150			05/12/21 11:27	05/14/21 03:53		1
13C2 PFDA	79		25 - 150			05/12/21 11:27	05/14/21 03:53		1
13C2 PFUnA	86		25 - 150			05/12/21 11:27	05/14/21 03:53		1
13C2 PFDoA	82		25 - 150			05/12/21 11:27	05/14/21 03:53		1
13C2 PFTeDA	76		25 - 150			05/12/21 11:27	05/14/21 03:53		1
13C3 PFBS	71		25 - 150			05/12/21 11:27	05/14/21 03:53		1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: STRUVITE-20210506

Date Collected: 05/06/21 10:10

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-9

Matrix: Solid

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
18O2 PFHxS	80		25 - 150	05/12/21 11:27	05/14/21 03:53	1
13C4 PFOS	82		25 - 150	05/12/21 11:27	05/14/21 03:53	1
13C8 FOSA	73		10 - 150	05/12/21 11:27	05/14/21 03:53	1
d3-NMeFOSAA	90		25 - 150	05/12/21 11:27	05/14/21 03:53	1
d5-NEtFOSAA	94		25 - 150	05/12/21 11:27	05/14/21 03:53	1
d-N-MeFOSA-M	57		10 - 150	05/12/21 11:27	05/14/21 03:53	1
d-N-EtFOSA-M	59		10 - 150	05/12/21 11:27	05/14/21 03:53	1
d7-N-MeFOSE-M	65		10 - 150	05/12/21 11:27	05/14/21 03:53	1
d9-N-EtFOSE-M	76		10 - 150	05/12/21 11:27	05/14/21 03:53	1
M2-4:2 FTS	86		25 - 150	05/12/21 11:27	05/14/21 03:53	1
M2-6:2 FTS	140		25 - 150	05/12/21 11:27	05/14/21 03:53	1
M2-8:2 FTS	133		25 - 150	05/12/21 11:27	05/14/21 03:53	1
13C3 HFPO-DA	66		25 - 150	05/12/21 11:27	05/14/21 03:53	1

Client Sample ID: POLYMER-1-20210506

Date Collected: 05/06/21 10:40

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-10

Matrix: Liquid

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.069		0.50	0.069	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluoropentanoic acid (PFPeA)	<0.19		0.50	0.19	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluorohexanoic acid (PFHxA)	<0.10		0.50	0.10	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluoroheptanoic acid (PFHpA)	<0.072		0.50	0.072	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluorooctanoic acid (PFOA)	<0.21		0.50	0.21	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluorononanoic acid (PFNA)	<0.089		0.50	0.089	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluorodecanoic acid (PFDA)	<0.054		0.50	0.054	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluoroundecanoic acid (PFUnA)	<0.089		0.50	0.089	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluorododecanoic acid (PFDoA)	<0.17		0.50	0.17	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluorotridecanoic acid (PFTrDA)	<0.13		0.50	0.13	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluorotetradecanoic acid (PFTeA)	<0.13		0.50	0.13	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluorobutanesulfonic acid (PFBS)	<0.062		0.50	0.062	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluoropentanesulfonic acid (PFPeS)	<0.050		0.50	0.050	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluorohexanesulfonic acid (PFHxS)	<0.077		0.50	0.077	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.087		0.50	0.087	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluorooctanesulfonic acid (PFOS)	<0.50		1.2	0.50	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluoronananesulfonic acid (PFNS)	<0.050		0.50	0.050	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluorodecanesulfonic acid (PFDS)	<0.097		0.50	0.097	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluorododecanesulfonic acid (PFDoS)	<0.15		0.50	0.15	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
Perfluorooctanesulfonamide (FOSA)	<0.20		0.50	0.20	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
NEtFOSA	<0.059		0.50	0.059	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
NMeFOSA	<0.099		0.50	0.099	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
NMeFOSAA	<0.97		5.0	0.97	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
NEtFOSAA	<0.92		5.0	0.92	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
NMeFOSE	<0.18		0.50	0.18	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
NEtFOSE	<0.089		0.50	0.089	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
4:2 FTS	<0.92		5.0	0.92	ug/Kg	05/18/21 13:00	05/21/21 10:19		1
6:2 FTS	<0.37		5.0	0.37	ug/Kg	05/18/21 13:00	05/21/21 10:19		1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: POLYMER-1-20210506

Lab Sample ID: 320-73382-10

Matrix: Liquid

Date Collected: 05/06/21 10:40
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
8:2 FTS	<0.62		5.0	0.62	ug/Kg		05/18/21 13:00	05/21/21 10:19	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.045		0.50	0.045	ug/Kg		05/18/21 13:00	05/21/21 10:19	1
HFPO-DA (GenX)	<0.27		0.62	0.27	ug/Kg		05/18/21 13:00	05/21/21 10:19	1
9Cl-PF3ONS	<0.067		0.50	0.067	ug/Kg		05/18/21 13:00	05/21/21 10:19	1
11Cl-PF3OUDs	<0.054		0.50	0.054	ug/Kg		05/18/21 13:00	05/21/21 10:19	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	4	*5-	25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C5 PFPeA	20	*5-	25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C2 PFHxA	41		25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C4 PFHpA	49		25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C4 PFOA	58		25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C5 PFNA	69		25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C2 PFDA	63		25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C2 PFUnA	53		25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C2 PFDoA	47		25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C2 PFTeDA	34		25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C3 PFBS	41		25 - 150				05/18/21 13:00	05/21/21 10:19	1
18O2 PFHxS	51		25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C4 PFOS	52		25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C8 FOSA	59		25 - 150				05/18/21 13:00	05/21/21 10:19	1
d3-NMeFOSAA	52		25 - 150				05/18/21 13:00	05/21/21 10:19	1
d5-NEtFOSAA	44		25 - 150				05/18/21 13:00	05/21/21 10:19	1
d-N-MeFOSA-M	47		25 - 150				05/18/21 13:00	05/21/21 10:19	1
d-N-EtFOSA-M	16	*5-	25 - 150				05/18/21 13:00	05/21/21 10:19	1
d7-N-MeFOSE-M	44		25 - 150				05/18/21 13:00	05/21/21 10:19	1
d9-N-EtFOSE-M	412	*5+	25 - 150				05/18/21 13:00	05/21/21 10:19	1
M2-4:2 FTS	60		25 - 150				05/18/21 13:00	05/21/21 10:19	1
M2-6:2 FTS	102		25 - 150				05/18/21 13:00	05/21/21 10:19	1
M2-8:2 FTS	153	*5+	25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C3 HFPO-DA	34		25 - 150				05/18/21 13:00	05/21/21 10:19	1
13C2 10:2 FTS	92		25 - 150				05/18/21 13:00	05/21/21 10:19	1

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.27	H	1.9	0.27	ug/Kg		05/24/21 13:33	05/26/21 01:31	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	62		25 - 150				05/24/21 13:33	05/26/21 01:31	1

Client Sample ID: POLYMER-2-20210506

Lab Sample ID: 320-73382-11

Matrix: Liquid

Date Collected: 05/06/21 09:50
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.31	J	0.45	0.063	ug/Kg		05/18/21 13:00	05/21/21 10:28	1
Perfluoropentanoic acid (PFPeA)	<0.17		0.45	0.17	ug/Kg		05/18/21 13:00	05/21/21 10:28	1
Perfluorohexanoic acid (PFHxA)	<0.094		0.45	0.094	ug/Kg		05/18/21 13:00	05/21/21 10:28	1
Perfluoroheptanoic acid (PFHpA)	<0.065		0.45	0.065	ug/Kg		05/18/21 13:00	05/21/21 10:28	1
Perfluorooctanoic acid (PFOA)	<0.19		0.45	0.19	ug/Kg		05/18/21 13:00	05/21/21 10:28	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: POLYMER-2-20210506

Lab Sample ID: 320-73382-11

Matrix: Liquid

Date Collected: 05/06/21 09:50
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	<0.080		0.45	0.080	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluorodecanoic acid (PFDA)	<0.049		0.45	0.049	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluoroundecanoic acid (PFUnA)	<0.080		0.45	0.080	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluorododecanoic acid (PFDa)	<0.15		0.45	0.15	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluorotridecanoic acid (PFTrDA)	<0.11		0.45	0.11	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluorotetradecanoic acid (PFTeA)	<0.12		0.45	0.12	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluorobutanesulfonic acid (PFBS)	<0.056		0.45	0.056	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluoropentanesulfonic acid (PPeS)	<0.045		0.45	0.045	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluorohexanesulfonic acid (PFHxS)	<0.069		0.45	0.069	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.078		0.45	0.078	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluorooctanesulfonic acid (PFOS)	<0.45		1.1	0.45	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluorononanesulfonic acid (PFNS)	<0.045		0.45	0.045	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluorodecanesulfonic acid (PFDS)	<0.087		0.45	0.087	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluorododecanesulfonic acid (PFDs)	<0.13		0.45	0.13	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Perfluoroctanesulfonamide (FOSA)	<0.18		0.45	0.18	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
NEtFOSA	<0.054		0.45	0.054	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
NMeFOSA	<0.089		0.45	0.089	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
NMeFOSAA	<0.87		4.5	0.87	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
NEtFOSAA	<0.83		4.5	0.83	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
NMeFOSE	<0.16		0.45	0.16	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
NEtFOSE	<0.080		0.45	0.080	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
4:2 FTS	<0.83		4.5	0.83	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
6:2 FTS	<0.33		4.5	0.33	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
8:2 FTS	<0.56		4.5	0.56	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.040		0.45	0.040	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
HFPO-DA (GenX)	<0.25		0.56	0.25	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
9Cl-PF3ONS	<0.060		0.45	0.060	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
11Cl-PF3OUds	<0.049		0.45	0.049	ug/Kg	05/18/21 13:00	05/21/21 10:28		1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
13C4 PFBA	6	*5-	25 - 150			05/18/21 13:00	05/21/21 10:28		1
13C5 PFPeA	27		25 - 150			05/18/21 13:00	05/21/21 10:28		1
13C2 PFHxA	40		25 - 150			05/18/21 13:00	05/21/21 10:28		1
13C4 PFhpA	42		25 - 150			05/18/21 13:00	05/21/21 10:28		1
13C4 PFOA	58		25 - 150			05/18/21 13:00	05/21/21 10:28		1
13C5 PFNA	56		25 - 150			05/18/21 13:00	05/21/21 10:28		1
13C2 PFDA	55		25 - 150			05/18/21 13:00	05/21/21 10:28		1
13C2 PFUnA	52		25 - 150			05/18/21 13:00	05/21/21 10:28		1
13C2 PFDa	3	*5-	25 - 150			05/18/21 13:00	05/21/21 10:28		1
13C2 PFTeDA	16	*5-	25 - 150			05/18/21 13:00	05/21/21 10:28		1
13C3 PFBS	32		25 - 150			05/18/21 13:00	05/21/21 10:28		1
18O2 PFHxS	38		25 - 150			05/18/21 13:00	05/21/21 10:28		1
13C4 PFOS	39		25 - 150			05/18/21 13:00	05/21/21 10:28		1
13C8 FOSA	53		25 - 150			05/18/21 13:00	05/21/21 10:28		1
d3-NMeFOSAA	55		25 - 150			05/18/21 13:00	05/21/21 10:28		1
d5-NEtFOSAA	49		25 - 150			05/18/21 13:00	05/21/21 10:28		1
d-N-MeFOSA-M	3	*5-	25 - 150			05/18/21 13:00	05/21/21 10:28		1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: POLYMER-2-20210506

Lab Sample ID: 320-73382-11

Matrix: Liquid

Date Collected: 05/06/21 09:50
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d-N-EtFOSA-M	5	*5-	25 - 150	05/18/21 13:00	05/21/21 10:28	1
d7-N-MeFOSE-M	15	*5-	25 - 150	05/18/21 13:00	05/21/21 10:28	1
d9-N-EtFOSE-M	22	*5-	25 - 150	05/18/21 13:00	05/21/21 10:28	1
M2-4:2 FTS	92		25 - 150	05/18/21 13:00	05/21/21 10:28	1
M2-6:2 FTS	142		25 - 150	05/18/21 13:00	05/21/21 10:28	1
M2-8:2 FTS	137		25 - 150	05/18/21 13:00	05/21/21 10:28	1
13C3 HFPO-DA	37		25 - 150	05/18/21 13:00	05/21/21 10:28	1
13C2 10:2 FTS	5		25 - 150	05/18/21 13:00	05/21/21 10:28	1

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.26	H	1.9	0.26	ug/Kg	05/24/21 13:33	05/26/21 01:40		1
Perfluorododecanoic acid (PFDoA)	<0.63	H	1.9	0.63	ug/Kg	05/24/21 13:33	05/26/21 01:40		1
Perfluorotridecanoic acid (PFTrDA)	<0.48	H	1.9	0.48	ug/Kg	05/24/21 13:33	05/26/21 01:40		1
N <i>Et</i> FOSA	<0.23	H	1.9	0.23	ug/Kg	05/24/21 13:33	05/26/21 01:40		1
N <i>Me</i> FOSA	<0.38	H	1.9	0.38	ug/Kg	05/24/21 13:33	05/26/21 01:40		1
N <i>Et</i> FOSE	<0.34	H	1.9	0.34	ug/Kg	05/24/21 13:33	05/26/21 01:40		1
Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
13C4 PFBA	44		25 - 150	05/24/21 13:33	05/26/21 01:40	1			
13C2 PFDoA	69		25 - 150	05/24/21 13:33	05/26/21 01:40	1			
d-N-MeFOSA-M	98		25 - 150	05/24/21 13:33	05/26/21 01:40	1			
d-N-EtFOSA-M	15	*5-	25 - 150	05/24/21 13:33	05/26/21 01:40	1			
d9-N-EtFOSE-M	46		25 - 150	05/24/21 13:33	05/26/21 01:40	1			

Client Sample ID: POLYMER-3-20210506

Lab Sample ID: 320-73382-12

Matrix: Liquid

Date Collected: 05/06/21 10:25
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.077	J	0.47	0.066	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluoropentanoic acid (PFPeA)	<0.18		0.47	0.18	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluorohexanoic acid (PFHxA)	<0.099		0.47	0.099	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluoroheptanoic acid (PFHpA)	<0.068		0.47	0.068	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluorooctanoic acid (PFOA)	<0.20		0.47	0.20	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluorononanoic acid (PFNA)	<0.085		0.47	0.085	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluorodecanoic acid (PFDA)	<0.052		0.47	0.052	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluoroundecanoic acid (PFUnA)	<0.085		0.47	0.085	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluorododecanoic acid (PFDoA)	<0.16		0.47	0.16	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluorotridecanoic acid (PFTrDA)	<0.12		0.47	0.12	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluorotetradecanoic acid (PFTeA)	<0.13		0.47	0.13	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluorobutanesulfonic acid (PFBS)	<0.059		0.47	0.059	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluoropentanesulfonic acid (PPPeS)	<0.047		0.47	0.047	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluorohexanesulfonic acid (PFHxS)	<0.073		0.47	0.073	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluoroheptanesulfonic Acid (PFHxS)	<0.082		0.47	0.082	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluorooctanesulfonic acid (PFOS)	<0.47		1.2	0.47	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluorononanesulfonic acid (PFNS)	<0.047		0.47	0.047	ug/Kg	05/18/21 13:00	05/21/21 10:37		1
Perfluorodecanesulfonic acid (PFDS)	<0.092		0.47	0.092	ug/Kg	05/18/21 13:00	05/21/21 10:37		1

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Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: POLYMER-3-20210506

Lab Sample ID: 320-73382-12

Matrix: Liquid

Date Collected: 05/06/21 10:25
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanesulfonic acid (PFDoS)	<0.14		0.47	0.14	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
Perfluoroctanesulfonamide (FOSA)	<0.19		0.47	0.19	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
NEtFOSA	<0.056		0.47	0.056	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
NMeFOSA	<0.094		0.47	0.094	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
NMeFOSAA	<0.92		4.7	0.92	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
NETFOSAA	<0.87		4.7	0.87	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
NMeFOSE	<0.17		0.47	0.17	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
NETFOSE	<0.085		0.47	0.085	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
4:2 FTS	<0.87		4.7	0.87	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
6:2 FTS	<0.35		4.7	0.35	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
8:2 FTS	<0.59		4.7	0.59	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.042		0.47	0.042	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
HFPO-DA (GenX)	<0.26		0.59	0.26	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
9Cl-PF3ONS	<0.063		0.47	0.063	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
11Cl-PF3OUDs	<0.052		0.47	0.052	ug/Kg		05/18/21 13:00	05/21/21 10:37	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	10	*5-	25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C5 PFPeA	43		25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C2 PFHxA	66		25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C4 PFHpA	63		25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C4 PFOA	75		25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C5 PFNA	72		25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C2 PFDA	67		25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C2 PFUnA	72		25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C2 PFDoA	44		25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C2 PFTeDA	33		25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C3 PFBS	50		25 - 150				05/18/21 13:00	05/21/21 10:37	1
18O2 PFHxS	57		25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C4 PFOS	57		25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C8 FOSA	60		25 - 150				05/18/21 13:00	05/21/21 10:37	1
d3-NMeFOSAA	70		25 - 150				05/18/21 13:00	05/21/21 10:37	1
d5-NEtFOSAA	63		25 - 150				05/18/21 13:00	05/21/21 10:37	1
d-N-MeFOSA-M	52		25 - 150				05/18/21 13:00	05/21/21 10:37	1
d-N-EtFOSA-M	2	*5-	25 - 150				05/18/21 13:00	05/21/21 10:37	1
d7-N-MeFOSE-M	51		25 - 150				05/18/21 13:00	05/21/21 10:37	1
d9-N-EtFOSE-M	193	*5+	25 - 150				05/18/21 13:00	05/21/21 10:37	1
M2-4:2 FTS	150		25 - 150				05/18/21 13:00	05/21/21 10:37	1
M2-6:2 FTS	170	*5+	25 - 150				05/18/21 13:00	05/21/21 10:37	1
M2-8:2 FTS	184	*5+	25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C3 HFPO-DA	50		25 - 150				05/18/21 13:00	05/21/21 10:37	1
13C2 10:2 FTS	83						05/18/21 13:00	05/21/21 10:37	1

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NETFOSA	<0.23	H	1.9	0.23	ug/Kg		05/24/21 13:33	05/26/21 01:50	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
d-N-EtFOSA-M	61		25 - 150				05/24/21 13:33	05/26/21 01:50	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: DUP01-20210506

Lab Sample ID: 320-73382-13

Matrix: Water

Date Collected: 05/06/21 00:00
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	5.1		4.2	2.0	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluoropentanoic acid (PFPeA)	170		1.7	0.41	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorohexanoic acid (PFHxA)	4.9 I		1.7	0.49	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluoroheptanoic acid (PFHpA)	1.1 J		1.7	0.21	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorooctanoic acid (PFOA)	2.5		1.7	0.71	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorononanoic acid (PFNA)	<0.23		1.7	0.23	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorodecanoic acid (PFDA)	<0.26		1.7	0.26	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluoroundecanoic acid (PFUnA)	<0.92		1.7	0.92	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorododecanoic acid (PFDoA)	<0.46		1.7	0.46	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorotridecanoic acid (PFTriA)	<1.1		1.7	1.1	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorotetradecanoic acid (PFTeA)	<0.61		1.7	0.61	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorobutanesulfonic acid (PFBS)	<0.17		1.7	0.17	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluoropentanesulfonic acid (PFPeS)	0.28 J		1.7	0.25	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorohexanesulfonic acid (PFHxS)	2.1 I		1.7	0.48	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.16		1.7	0.16	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorooctanesulfonic acid (PFOS)	2.3		1.7	0.45	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorononanesulfonic acid (PFNS)	<0.31		1.7	0.31	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorodecanesulfonic acid (PFDS)	<0.27		1.7	0.27	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorododecanesulfonic acid (PFDoS)	<0.81		1.7	0.81	ng/L	05/12/21 12:16	05/13/21 06:59		1
Perfluorooctanesulfonamide (FOSA)	<0.82		1.7	0.82	ng/L	05/12/21 12:16	05/13/21 06:59		1
NEtFOSA	<0.73		1.7	0.73	ng/L	05/12/21 12:16	05/13/21 06:59		1
NMeFOSA	<0.36		1.7	0.36	ng/L	05/12/21 12:16	05/13/21 06:59		1
NMeFOSAA	<1.0		4.2	1.0	ng/L	05/12/21 12:16	05/13/21 06:59		1
NEtFOSAA	<1.1		4.2	1.1	ng/L	05/12/21 12:16	05/13/21 06:59		1
NMeFOSE	<1.2		3.3	1.2	ng/L	05/12/21 12:16	05/13/21 06:59		1
NEtFOSE	<0.71		1.7	0.71	ng/L	05/12/21 12:16	05/13/21 06:59		1
4:2 FTS	<0.20		1.7	0.20	ng/L	05/12/21 12:16	05/13/21 06:59		1
6:2 FTS	2.8 J		4.2	2.1	ng/L	05/12/21 12:16	05/13/21 06:59		1
8:2 FTS	<0.39		1.7	0.39	ng/L	05/12/21 12:16	05/13/21 06:59		1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.33		1.7	0.33	ng/L	05/12/21 12:16	05/13/21 06:59		1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.3		3.3	1.3	ng/L	05/12/21 12:16	05/13/21 06:59		1
F-53B Major	<0.20		1.7	0.20	ng/L	05/12/21 12:16	05/13/21 06:59		1
F-53B Minor	<0.27		1.7	0.27	ng/L	05/12/21 12:16	05/13/21 06:59		1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
13C4 PFBA	33		25 - 150			05/12/21 12:16	05/13/21 06:59		1
13C5 PFPeA	19	*5-	25 - 150			05/12/21 12:16	05/13/21 06:59		1
13C2 PFHxA	40		25 - 150			05/12/21 12:16	05/13/21 06:59		1
13C4 PFHpA	31		25 - 150			05/12/21 12:16	05/13/21 06:59		1
13C4 PFOA	38		25 - 150			05/12/21 12:16	05/13/21 06:59		1
13C5 PFNA	33		25 - 150			05/12/21 12:16	05/13/21 06:59		1
13C2 PFDA	31		25 - 150			05/12/21 12:16	05/13/21 06:59		1
13C2 PFUnA	25		25 - 150			05/12/21 12:16	05/13/21 06:59		1
13C2 PFDoA	18	*5-	25 - 150			05/12/21 12:16	05/13/21 06:59		1
13C2 PFTeDA	22	*5-	25 - 150			05/12/21 12:16	05/13/21 06:59		1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: DUP01-20210506

Lab Sample ID: 320-73382-13

Matrix: Water

Date Collected: 05/06/21 00:00
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 PFBS	29		25 - 150	05/12/21 12:16	05/13/21 06:59	1
18O2 PFHxS	34		25 - 150	05/12/21 12:16	05/13/21 06:59	1
13C4 PFOS	32		25 - 150	05/12/21 12:16	05/13/21 06:59	1
13C8 FOSA	22		10 - 150	05/12/21 12:16	05/13/21 06:59	1
d3-NMeFOSAA	22	*5-	25 - 150	05/12/21 12:16	05/13/21 06:59	1
d5-NEtFOSAA	13	*5-	25 - 150	05/12/21 12:16	05/13/21 06:59	1
d-N-MeFOSA-M	20		10 - 150	05/12/21 12:16	05/13/21 06:59	1
d-N-EtFOSA-M	18		10 - 150	05/12/21 12:16	05/13/21 06:59	1
d7-N-MeFOSE-M	15		10 - 150	05/12/21 12:16	05/13/21 06:59	1
d9-N-EtFOSE-M	15		10 - 150	05/12/21 12:16	05/13/21 06:59	1
M2-4:2 FTS	56		25 - 150	05/12/21 12:16	05/13/21 06:59	1
M2-6:2 FTS	59		25 - 150	05/12/21 12:16	05/13/21 06:59	1
M2-8:2 FTS	40		25 - 150	05/12/21 12:16	05/13/21 06:59	1
13C3 HFPO-DA	31		25 - 150	05/12/21 12:16	05/13/21 06:59	1

Client Sample ID: DUP02-20210506

Lab Sample ID: 320-73382-14

Matrix: Water

Date Collected: 05/06/21 00:00
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	11		4.6	2.2	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluoropentanoic acid (PFPeA)	17		1.8	0.45	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluorohexanoic acid (PFHxA)	22		1.8	0.53	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluoroheptanoic acid (PFHpA)	3.8		1.8	0.23	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluorooctanoic acid (PFOA)	11		1.8	0.78	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluorononanoic acid (PFNA)	0.71	J	1.8	0.25	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluorodecanoic acid (PFDA)	1.5	J	1.8	0.29	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluoroundecanoic acid (PFUnA)	<1.0		1.8	1.0	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluorododecanoic acid (PFDoA)	<0.51		1.8	0.51	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluorotridecanoic acid (PFTriA)	<1.2		1.8	1.2	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluorotetradecanoic acid (PFTeA)	<0.67		1.8	0.67	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluorobutanesulfonic acid (PFBS)	<0.18		1.8	0.18	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluoropentanesulfonic acid (PFPeS)	0.91	J	1.8	0.28	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluorohexanesulfonic acid (PFHxS)	7.0		1.8	0.53	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.18		1.8	0.18	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluorooctanesulfonic acid (PFOS)	3.7		1.8	0.50	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluoronananesulfonic acid (PFNS)	<0.34		1.8	0.34	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluorodecanesulfonic acid (PFDS)	<0.29		1.8	0.29	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluorododecanesulfonic acid (PFDoS)	<0.89		1.8	0.89	ng/L	05/12/21 12:16	05/13/21 07:09		1
Perfluorooctanesulfonamide (FOSA)	2.1		1.8	0.90	ng/L	05/12/21 12:16	05/13/21 07:09		1
NEtFOSA	<0.80		1.8	0.80	ng/L	05/12/21 12:16	05/13/21 07:09		1
NMeFOSA	<0.40		1.8	0.40	ng/L	05/12/21 12:16	05/13/21 07:09		1
NMeFOSAA	1.3	J	4.6	1.1	ng/L	05/12/21 12:16	05/13/21 07:09		1
NEtFOSAA	<1.2		4.6	1.2	ng/L	05/12/21 12:16	05/13/21 07:09		1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: DUP02-20210506
Date Collected: 05/06/21 00:00
Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-14
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NMeFOSE	<1.3		3.7	1.3	ng/L		05/12/21 12:16	05/13/21 07:09	1
NEtFOSE	<0.78		1.8	0.78	ng/L		05/12/21 12:16	05/13/21 07:09	1
4:2 FTS	<0.22		1.8	0.22	ng/L		05/12/21 12:16	05/13/21 07:09	1
6:2 FTS	<2.3		4.6	2.3	ng/L		05/12/21 12:16	05/13/21 07:09	1
8:2 FTS	<0.42		1.8	0.42	ng/L		05/12/21 12:16	05/13/21 07:09	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.37		1.8	0.37	ng/L		05/12/21 12:16	05/13/21 07:09	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.4		3.7	1.4	ng/L		05/12/21 12:16	05/13/21 07:09	1
F-53B Major	<0.22		1.8	0.22	ng/L		05/12/21 12:16	05/13/21 07:09	1
F-53B Minor	<0.29		1.8	0.29	ng/L		05/12/21 12:16	05/13/21 07:09	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	55		25 - 150				05/12/21 12:16	05/13/21 07:09	1
13C5 PFPeA	38		25 - 150				05/12/21 12:16	05/13/21 07:09	1
13C2 PFHxA	87		25 - 150				05/12/21 12:16	05/13/21 07:09	1
13C4 PFHpA	65		25 - 150				05/12/21 12:16	05/13/21 07:09	1
13C4 PFOA	78		25 - 150				05/12/21 12:16	05/13/21 07:09	1
13C5 PFNA	77		25 - 150				05/12/21 12:16	05/13/21 07:09	1
13C2 PFDA	89		25 - 150				05/12/21 12:16	05/13/21 07:09	1
13C2 PFUnA	92		25 - 150				05/12/21 12:16	05/13/21 07:09	1
13C2 PFDoA	83		25 - 150				05/12/21 12:16	05/13/21 07:09	1
13C2 PFTeDA	54		25 - 150				05/12/21 12:16	05/13/21 07:09	1
13C3 PFBS	55		25 - 150				05/12/21 12:16	05/13/21 07:09	1
18O2 PFHxS	74		25 - 150				05/12/21 12:16	05/13/21 07:09	1
13C4 PFOS	85		25 - 150				05/12/21 12:16	05/13/21 07:09	1
13C8 FOSA	79		10 - 150				05/12/21 12:16	05/13/21 07:09	1
d3-NMeFOSAA	88		25 - 150				05/12/21 12:16	05/13/21 07:09	1
d5-NEtFOSAA	87		25 - 150				05/12/21 12:16	05/13/21 07:09	1
d-N-MeFOSA-M	70		10 - 150				05/12/21 12:16	05/13/21 07:09	1
d-N-EtFOSA-M	59		10 - 150				05/12/21 12:16	05/13/21 07:09	1
d7-N-MeFOSE-M	69		10 - 150				05/12/21 12:16	05/13/21 07:09	1
d9-N-EtFOSE-M	62		10 - 150				05/12/21 12:16	05/13/21 07:09	1
M2-4:2 FTS	104		25 - 150				05/12/21 12:16	05/13/21 07:09	1
M2-6:2 FTS	113		25 - 150				05/12/21 12:16	05/13/21 07:09	1
M2-8:2 FTS	128		25 - 150				05/12/21 12:16	05/13/21 07:09	1
13C3 HFPO-DA	71		25 - 150				05/12/21 12:16	05/13/21 07:09	1

Client Sample ID: DUP03-20210506

Date Collected: 05/06/21 00:00
Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-15
Matrix: Solid
Percent Solids: 6.0

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<4.5		32	4.5	ug/Kg	✉	05/12/21 11:27	05/16/21 06:06	10
Perfluoropentanoic acid (PFPeA)	<12		32	12	ug/Kg	✉	05/12/21 11:27	05/16/21 06:06	10
Perfluorohexanoic acid (PFHxA)	<6.8		32	6.8	ug/Kg	✉	05/12/21 11:27	05/16/21 06:06	10
Perfluoroheptanoic acid (PFHpA)	<4.7		32	4.7	ug/Kg	✉	05/12/21 11:27	05/16/21 06:06	10
Perfluorooctanoic acid (PFOA)	<14		32	14	ug/Kg	✉	05/12/21 11:27	05/16/21 06:06	10
Perfluorononanoic acid (PFNA)	<5.8		32	5.8	ug/Kg	✉	05/12/21 11:27	05/16/21 06:06	10
Perfluorodecanoic acid (PFDA)	<3.5		32	3.5	ug/Kg	✉	05/12/21 11:27	05/16/21 06:06	10

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: DUP03-20210506

Lab Sample ID: 320-73382-15

Date Collected: 05/06/21 00:00
Date Received: 05/07/21 10:05

Matrix: Solid

Percent Solids: 6.0

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	<5.8		32	5.8	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
Perfluorododecanoic acid (PFDa)	<11		32	11	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
Perfluorotridecanoic acid (PFTriA)	<8.2		32	8.2	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
Perfluorotetradecanoic acid (PFTeA)	<8.7		32	8.7	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
Perfluorobutanesulfonic acid (PFBS)	<4.0		32	4.0	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
Perfluoropentanesulfonic acid (PFPeS)	<3.2		32	3.2	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
Perfluorohexanesulfonic acid (PFHxS)	<5.0		32	5.0	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
Perfluoroheptanesulfonic Acid (PFHpS)	<5.6		32	5.6	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
Perfluorooctanesulfonic acid (PFOS)	<32		80	32	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
Perfluorononanesulfonic acid (PFNS)	<3.2		32	3.2	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
Perfluorodecanesulfonic acid (PFDS)	<6.3		32	6.3	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
Perfluorododecanesulfonic acid (PFDs)	<9.6		32	9.6	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
Perfluoroctanesulfonamide (FOSA)	<13		32	13	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
NEtFOSA	<3.9		32	3.9	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
NMeFOSA	<6.6		32	6.6	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
NMeFOSAA	<63		320	63	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
NETFOSAA	<59		320	59	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
NMeFOSE	<11		32	11	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
NETFOSE	<5.8		32	5.8	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
4:2 FTS	<59		320	59	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
6:2 FTS	<24		320	24	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
8:2 FTS	<40		320	40	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.9		32	2.9	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<18		40	18	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
F-53B Major	<4.3		32	4.3	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10
F-53B Minor	<3.5		32	3.5	ug/Kg	⊗	05/12/21 11:27	05/16/21 06:06	10

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	87		25 - 150	05/12/21 11:27	05/16/21 06:06	10
13C5 PFPeA	80		25 - 150	05/12/21 11:27	05/16/21 06:06	10
13C2 PFHxA	71		25 - 150	05/12/21 11:27	05/16/21 06:06	10
13C4 PFHpA	81		25 - 150	05/12/21 11:27	05/16/21 06:06	10
13C4 PFOA	85		25 - 150	05/12/21 11:27	05/16/21 06:06	10
13C5 PFNA	92		25 - 150	05/12/21 11:27	05/16/21 06:06	10
13C2 PFDA	82		25 - 150	05/12/21 11:27	05/16/21 06:06	10
13C2 PFUnA	89		25 - 150	05/12/21 11:27	05/16/21 06:06	10
13C2 PFDa	70		25 - 150	05/12/21 11:27	05/16/21 06:06	10
13C2 PFTeDA	50		25 - 150	05/12/21 11:27	05/16/21 06:06	10
13C3 PFBS	76		25 - 150	05/12/21 11:27	05/16/21 06:06	10
18O2 PFHxS	69		25 - 150	05/12/21 11:27	05/16/21 06:06	10
13C4 PFOS	81		25 - 150	05/12/21 11:27	05/16/21 06:06	10
13C8 FOSA	69		10 - 150	05/12/21 11:27	05/16/21 06:06	10
d3-NMeFOSAA	91		25 - 150	05/12/21 11:27	05/16/21 06:06	10
d5-NEtFOSAA	80		25 - 150	05/12/21 11:27	05/16/21 06:06	10
d-N-MeFOSA-M	54		10 - 150	05/12/21 11:27	05/16/21 06:06	10
d-N-EtFOSA-M	43		10 - 150	05/12/21 11:27	05/16/21 06:06	10

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: DUP03-20210506

Date Collected: 05/06/21 00:00

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-15

Matrix: Solid

Percent Solids: 6.0

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d7-N-MeFOSE-M	49		10 - 150	05/12/21 11:27	05/16/21 06:06	10
d9-N-EtFOSE-M	61		10 - 150	05/12/21 11:27	05/16/21 06:06	10
M2-4:2 FTS	96		25 - 150	05/12/21 11:27	05/16/21 06:06	10
M2-6:2 FTS	109		25 - 150	05/12/21 11:27	05/16/21 06:06	10
M2-8:2 FTS	180 *5+		25 - 150	05/12/21 11:27	05/16/21 06:06	10
13C3 HFPO-DA	82		25 - 150	05/12/21 11:27	05/16/21 06:06	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	94.0		0.1	0.1	%			05/12/21 16:27	1
Percent Solids	6.0		0.1	0.1	%			05/12/21 16:27	1

Client Sample ID: DUP04-20210506

Date Collected: 05/06/21 00:00

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-16

Matrix: Liquid

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.065		0.47	0.065	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluoropentanoic acid (PFPeA)	<0.18		0.47	0.18	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluorohexanoic acid (PFHxA)	<0.098		0.47	0.098	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluoroheptanoic acid (PFHpA)	<0.067		0.47	0.067	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluorooctanoic acid (PFOA)	<0.20		0.47	0.20	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluorononanoic acid (PFNA)	<0.084		0.47	0.084	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluorodecanoic acid (PFDA)	<0.051		0.47	0.051	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluoroundecanoic acid (PFUnA)	<0.084		0.47	0.084	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluorododecanoic acid (PFDoA)	<0.16		0.47	0.16	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluorotridecanoic acid (PFTrDA)	<0.12		0.47	0.12	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluorotetradecanoic acid (PFTeA)	<0.13		0.47	0.13	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluorobutanesulfonic acid (PFBS)	<0.058		0.47	0.058	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluoropentanesulfonic acid (PFPeS)	<0.047		0.47	0.047	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluorohexanesulfonic acid (PFHxS)	<0.072		0.47	0.072	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluoroheptanesulfonic Acid (PFHpS)	<0.081		0.47	0.081	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluoroctanesulfonic acid (PFOS)	0.48 J		1.2	0.47	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluoronananesulfonic acid (PFNS)	<0.047		0.47	0.047	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluorodecanesulfonic acid (PFDS)	<0.091		0.47	0.091	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluorododecanesulfonic acid (PFDoS)	<0.14		0.47	0.14	ug/Kg			05/18/21 13:00	05/21/21 10:46
Perfluoroctanesulfonamide (FOSA)	<0.19		0.47	0.19	ug/Kg			05/18/21 13:00	05/21/21 10:46
NEtFOSA	<0.056		0.47	0.056	ug/Kg			05/18/21 13:00	05/21/21 10:46
NMeFOSA	<0.093		0.47	0.093	ug/Kg			05/18/21 13:00	05/21/21 10:46
NMeFOSAA	<0.91		4.7	0.91	ug/Kg			05/18/21 13:00	05/21/21 10:46
NEtFOSAA	<0.86		4.7	0.86	ug/Kg			05/18/21 13:00	05/21/21 10:46
NMeFOSE	<0.17		0.47	0.17	ug/Kg			05/18/21 13:00	05/21/21 10:46
NEtFOSE	<0.084		0.47	0.084	ug/Kg			05/18/21 13:00	05/21/21 10:46
4:2 FTS	<0.86		4.7	0.86	ug/Kg			05/18/21 13:00	05/21/21 10:46
6:2 FTS	<0.35		4.7	0.35	ug/Kg			05/18/21 13:00	05/21/21 10:46
8:2 FTS	<0.58		4.7	0.58	ug/Kg			05/18/21 13:00	05/21/21 10:46

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: DUP04-20210506

Lab Sample ID: 320-73382-16

Matrix: Liquid

Date Collected: 05/06/21 00:00
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.042		0.47	0.042	ug/Kg		05/18/21 13:00	05/21/21 10:46	1
HFPO-DA (GenX)	<0.26		0.58	0.26	ug/Kg		05/18/21 13:00	05/21/21 10:46	1
9Cl-PF3ONS	<0.063		0.47	0.063	ug/Kg		05/18/21 13:00	05/21/21 10:46	1
11Cl-PF3OUds	<0.051		0.47	0.051	ug/Kg		05/18/21 13:00	05/21/21 10:46	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	5	*5-	25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C5 PFPeA	33		25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C2 PFHxA	60		25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C4 PFHpA	85		25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C4 PFOA	92		25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C5 PFNA	102		25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C2 PFDA	100		25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C2 PFUnA	87		25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C2 PFDaA	59		25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C2 PFTeDA	37		25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C3 PFBS	63		25 - 150				05/18/21 13:00	05/21/21 10:46	1
18O2 PFHxS	77		25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C4 PFOS	77		25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C8 FOSA	82		25 - 150				05/18/21 13:00	05/21/21 10:46	1
d3-NMeFOSAA	90		25 - 150				05/18/21 13:00	05/21/21 10:46	1
d5-NEtFOSAA	87		25 - 150				05/18/21 13:00	05/21/21 10:46	1
d-N-MeFOSA-M	67		25 - 150				05/18/21 13:00	05/21/21 10:46	1
d-N-EtFOSA-M	3 *5-		25 - 150				05/18/21 13:00	05/21/21 10:46	1
d7-N-MeFOSE-M	69		25 - 150				05/18/21 13:00	05/21/21 10:46	1
d9-N-EtFOSE-M	227 *5+		25 - 150				05/18/21 13:00	05/21/21 10:46	1
M2-4:2 FTS	108		25 - 150				05/18/21 13:00	05/21/21 10:46	1
M2-6:2 FTS	200 *5+		25 - 150				05/18/21 13:00	05/21/21 10:46	1
M2-8:2 FTS	251 *5+		25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C3 HFPO-DA	56		25 - 150				05/18/21 13:00	05/21/21 10:46	1
13C2 10:2 FTS	127		25 - 150				05/18/21 13:00	05/21/21 10:46	1

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.27	H	1.9	0.27	ug/Kg		05/24/21 13:33	05/26/21 01:59	1
NEtFOSA	<0.23	H	1.9	0.23	ug/Kg		05/24/21 13:33	05/26/21 01:59	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	49		25 - 150				05/24/21 13:33	05/26/21 01:59	1
d-N-EtFOSA-M	58		25 - 150				05/24/21 13:33	05/26/21 01:59	1

Client Sample ID: EB01-20210504

Lab Sample ID: 320-73382-17

Matrix: Water

Date Collected: 05/04/21 16:00

Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<2.2		4.6	2.2	ng/L		05/12/21 12:16	05/13/21 07:18	1
Perfluoropentanoic acid (PFPeA)	<0.45		1.8	0.45	ng/L		05/12/21 12:16	05/13/21 07:18	1
Perfluorohexanoic acid (PFHxA)	<0.53		1.8	0.53	ng/L		05/12/21 12:16	05/13/21 07:18	1
Perfluorooctanoic acid (PFHpA)	<0.23		1.8	0.23	ng/L		05/12/21 12:16	05/13/21 07:18	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: EB01-20210504

Lab Sample ID: 320-73382-17

Matrix: Water

Date Collected: 05/04/21 16:00
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroctanoic acid (PFOA)	<0.78		1.8	0.78	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluorononanoic acid (PFNA)	<0.25		1.8	0.25	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluorodecanoic acid (PFDA)	<0.28		1.8	0.28	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluoroundecanoic acid (PFUnA)	<1.0		1.8	1.0	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluorododecanoic acid (PFDoA)	<0.50		1.8	0.50	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluorotridecanoic acid (PFTriA)	<1.2		1.8	1.2	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluorotetradecanoic acid (PFTeA)	<0.67		1.8	0.67	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluorobutanesulfonic acid (PFBS)	<0.18		1.8	0.18	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluoropentanesulfonic acid (PFPeS)	<0.27		1.8	0.27	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluorohexanesulfonic acid (PFHxS)	<0.52		1.8	0.52	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.17		1.8	0.17	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluoroctanesulfonic acid (PFOS)	<0.49		1.8	0.49	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluorononanesulfonic acid (PFNS)	<0.34		1.8	0.34	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluorodecanesulfonic acid (PFDS)	<0.29		1.8	0.29	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluorododecanesulfonic acid (PFDoS)	<0.89		1.8	0.89	ng/L	05/12/21 12:16	05/13/21 07:18		1
Perfluorooctanesulfonamide (FOSA)	<0.90		1.8	0.90	ng/L	05/12/21 12:16	05/13/21 07:18		1
NEtFOSA	<0.80		1.8	0.80	ng/L	05/12/21 12:16	05/13/21 07:18		1
NMeFOSA	<0.39		1.8	0.39	ng/L	05/12/21 12:16	05/13/21 07:18		1
NMeFOSAA	<1.1		4.6	1.1	ng/L	05/12/21 12:16	05/13/21 07:18		1
NEtFOSAA	<1.2		4.6	1.2	ng/L	05/12/21 12:16	05/13/21 07:18		1
NMeFOSE	<1.3		3.7	1.3	ng/L	05/12/21 12:16	05/13/21 07:18		1
NEtFOSE	<0.78		1.8	0.78	ng/L	05/12/21 12:16	05/13/21 07:18		1
4:2 FTS	<0.22		1.8	0.22	ng/L	05/12/21 12:16	05/13/21 07:18		1
6:2 FTS	<2.3		4.6	2.3	ng/L	05/12/21 12:16	05/13/21 07:18		1
8:2 FTS	<0.42		1.8	0.42	ng/L	05/12/21 12:16	05/13/21 07:18		1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.37		1.8	0.37	ng/L	05/12/21 12:16	05/13/21 07:18		1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.4		3.7	1.4	ng/L	05/12/21 12:16	05/13/21 07:18		1
F-53B Major	<0.22		1.8	0.22	ng/L	05/12/21 12:16	05/13/21 07:18		1
F-53B Minor	<0.29		1.8	0.29	ng/L	05/12/21 12:16	05/13/21 07:18		1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
13C4 PFBA	75		25 - 150			05/12/21 12:16	05/13/21 07:18		1
13C5 PFPeA	68		25 - 150			05/12/21 12:16	05/13/21 07:18		1
13C2 PFHxA	87		25 - 150			05/12/21 12:16	05/13/21 07:18		1
13C4 PFhPA	77		25 - 150			05/12/21 12:16	05/13/21 07:18		1
13C4 PFOA	80		25 - 150			05/12/21 12:16	05/13/21 07:18		1
13C5 PFNA	83		25 - 150			05/12/21 12:16	05/13/21 07:18		1
13C2 PFDA	83		25 - 150			05/12/21 12:16	05/13/21 07:18		1
13C2 PFUnA	93		25 - 150			05/12/21 12:16	05/13/21 07:18		1
13C2 PFDoA	80		25 - 150			05/12/21 12:16	05/13/21 07:18		1
13C2 PFTeDA	80		25 - 150			05/12/21 12:16	05/13/21 07:18		1
13C3 PFBS	67		25 - 150			05/12/21 12:16	05/13/21 07:18		1
18O2 PFHxS	84		25 - 150			05/12/21 12:16	05/13/21 07:18		1
13C4 PFOS	82		25 - 150			05/12/21 12:16	05/13/21 07:18		1
13C8 FOSA	81		10 - 150			05/12/21 12:16	05/13/21 07:18		1
d3-NMeFOSAA	100		25 - 150			05/12/21 12:16	05/13/21 07:18		1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: EB01-20210504

Lab Sample ID: 320-73382-17

Matrix: Water

Date Collected: 05/04/21 16:00
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	89		25 - 150	05/12/21 12:16	05/13/21 07:18	1
d-N-MeFOSA-M	61		10 - 150	05/12/21 12:16	05/13/21 07:18	1
d-N-EtFOSA-M	60		10 - 150	05/12/21 12:16	05/13/21 07:18	1
d7-N-MeFOSE-M	74		10 - 150	05/12/21 12:16	05/13/21 07:18	1
d9-N-EtFOSE-M	75		10 - 150	05/12/21 12:16	05/13/21 07:18	1
M2-4:2 FTS	61		25 - 150	05/12/21 12:16	05/13/21 07:18	1
M2-6:2 FTS	88		25 - 150	05/12/21 12:16	05/13/21 07:18	1
M2-8:2 FTS	98		25 - 150	05/12/21 12:16	05/13/21 07:18	1
13C3 HFPO-DA	78		25 - 150	05/12/21 12:16	05/13/21 07:18	1

Client Sample ID: FB01-20210506

Lab Sample ID: 320-73382-18

Matrix: Water

Date Collected: 05/06/21 09:09
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<2.1		4.4	2.1	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluoropentanoic acid (PFPeA)	<0.43		1.8	0.43	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluorohexanoic acid (PFHxA)	<0.51		1.8	0.51	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluoroheptanoic acid (PFHpA)	<0.22		1.8	0.22	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluorooctanoic acid (PFOA)	<0.75		1.8	0.75	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluorononanoic acid (PFNA)	<0.24		1.8	0.24	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluorodecanoic acid (PFDA)	<0.27		1.8	0.27	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluoroundecanoic acid (PFUnA)	<0.97		1.8	0.97	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluorododecanoic acid (PFDoA)	<0.48		1.8	0.48	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluorotridecanoic acid (PFTriA)	<1.1		1.8	1.1	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluorotetradecanoic acid (PFTeA)	<0.64		1.8	0.64	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluorobutanesulfonic acid (PFBS)	<0.18		1.8	0.18	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluoropentanesulfonic acid (PFPeS)	<0.26		1.8	0.26	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluorohexanesulfonic acid (PFHxS)	<0.50		1.8	0.50	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.17		1.8	0.17	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluorooctanesulfonic acid (PFOS)	<0.47		1.8	0.47	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluoronananesulfonic acid (PFNS)	<0.33		1.8	0.33	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluorodecanesulfonic acid (PFDS)	<0.28		1.8	0.28	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluorododecanesulfonic acid (PFDoS)	<0.85		1.8	0.85	ng/L	05/12/21 12:16	05/13/21 07:28		1
Perfluoroctanesulfonamide (FOSA)	<0.86		1.8	0.86	ng/L	05/12/21 12:16	05/13/21 07:28		1
NEtFOSA	<0.76		1.8	0.76	ng/L	05/12/21 12:16	05/13/21 07:28		1
NMeFOSA	<0.38		1.8	0.38	ng/L	05/12/21 12:16	05/13/21 07:28		1
NMeFOSAA	<1.1		4.4	1.1	ng/L	05/12/21 12:16	05/13/21 07:28		1
NEtFOSAA	<1.1		4.4	1.1	ng/L	05/12/21 12:16	05/13/21 07:28		1
NMeFOSE	<1.2		3.5	1.2	ng/L	05/12/21 12:16	05/13/21 07:28		1
NEtFOSE	<0.75		1.8	0.75	ng/L	05/12/21 12:16	05/13/21 07:28		1
4:2 FTS	<0.21		1.8	0.21	ng/L	05/12/21 12:16	05/13/21 07:28		1
6:2 FTS	<2.2		4.4	2.2	ng/L	05/12/21 12:16	05/13/21 07:28		1
8:2 FTS	<0.40		1.8	0.40	ng/L	05/12/21 12:16	05/13/21 07:28		1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.35		1.8	0.35	ng/L	05/12/21 12:16	05/13/21 07:28		1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: FB01-20210506

Lab Sample ID: 320-73382-18

Matrix: Water

Date Collected: 05/06/21 09:09
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.3		3.5	1.3	ng/L		05/12/21 12:16	05/13/21 07:28	1
F-53B Major	<0.21		1.8	0.21	ng/L		05/12/21 12:16	05/13/21 07:28	1
F-53B Minor	<0.28		1.8	0.28	ng/L		05/12/21 12:16	05/13/21 07:28	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	88		25 - 150				05/12/21 12:16	05/13/21 07:28	1
13C5 PFPeA	92		25 - 150				05/12/21 12:16	05/13/21 07:28	1
13C2 PFHxA	105		25 - 150				05/12/21 12:16	05/13/21 07:28	1
13C4 PFHpA	94		25 - 150				05/12/21 12:16	05/13/21 07:28	1
13C4 PFOA	91		25 - 150				05/12/21 12:16	05/13/21 07:28	1
13C5 PFNA	97		25 - 150				05/12/21 12:16	05/13/21 07:28	1
13C2 PFDA	96		25 - 150				05/12/21 12:16	05/13/21 07:28	1
13C2 PFUnA	109		25 - 150				05/12/21 12:16	05/13/21 07:28	1
13C2 PFDoA	94		25 - 150				05/12/21 12:16	05/13/21 07:28	1
13C2 PFTeDA	93		25 - 150				05/12/21 12:16	05/13/21 07:28	1
13C3 PFBS	87		25 - 150				05/12/21 12:16	05/13/21 07:28	1
18O2 PFHxS	88		25 - 150				05/12/21 12:16	05/13/21 07:28	1
13C4 PFOS	89		25 - 150				05/12/21 12:16	05/13/21 07:28	1
13C8 FOSA	92		10 - 150				05/12/21 12:16	05/13/21 07:28	1
d3-NMeFOSAA	113		25 - 150				05/12/21 12:16	05/13/21 07:28	1
d5-NEtFOSAA	115		25 - 150				05/12/21 12:16	05/13/21 07:28	1
d-N-MeFOSA-M	68		10 - 150				05/12/21 12:16	05/13/21 07:28	1
d-N-EtFOSA-M	67		10 - 150				05/12/21 12:16	05/13/21 07:28	1
d7-N-MeFOSE-M	97		10 - 150				05/12/21 12:16	05/13/21 07:28	1
d9-N-EtFOSE-M	86		10 - 150				05/12/21 12:16	05/13/21 07:28	1
M2-4:2 FTS	77		25 - 150				05/12/21 12:16	05/13/21 07:28	1
M2-6:2 FTS	93		25 - 150				05/12/21 12:16	05/13/21 07:28	1
M2-8:2 FTS	121		25 - 150				05/12/21 12:16	05/13/21 07:28	1
13C3 HFPO-DA	86		25 - 150				05/12/21 12:16	05/13/21 07:28	1

Client Sample ID: FB02-20210506

Lab Sample ID: 320-73382-19

Matrix: Water

Date Collected: 05/06/21 11:15
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<2.2		4.6	2.2	ng/L		05/12/21 12:16	05/13/21 07:37	1
Perfluoropentanoic acid (PFPeA)	<0.45		1.8	0.45	ng/L		05/12/21 12:16	05/13/21 07:37	1
Perfluorohexanoic acid (PFHxA)	<0.53		1.8	0.53	ng/L		05/12/21 12:16	05/13/21 07:37	1
Perfluoroheptanoic acid (PFHpA)	<0.23		1.8	0.23	ng/L		05/12/21 12:16	05/13/21 07:37	1
Perfluorooctanoic acid (PFOA)	<0.78		1.8	0.78	ng/L		05/12/21 12:16	05/13/21 07:37	1
Perfluorononanoic acid (PFNA)	<0.25		1.8	0.25	ng/L		05/12/21 12:16	05/13/21 07:37	1
Perfluorodecanoic acid (PFDA)	<0.29		1.8	0.29	ng/L		05/12/21 12:16	05/13/21 07:37	1
Perfluoroundecanoic acid (PFUnA)	<1.0		1.8	1.0	ng/L		05/12/21 12:16	05/13/21 07:37	1
Perfluorododecanoic acid (PFDoA)	<0.51		1.8	0.51	ng/L		05/12/21 12:16	05/13/21 07:37	1
Perfluorotridecanoic acid (PFTriA)	<1.2		1.8	1.2	ng/L		05/12/21 12:16	05/13/21 07:37	1
Perfluorotetradecanoic acid (PFTeA)	<0.67		1.8	0.67	ng/L		05/12/21 12:16	05/13/21 07:37	1
Perfluorobutanesulfonic acid (PFBS)	<0.18		1.8	0.18	ng/L		05/12/21 12:16	05/13/21 07:37	1
Perfluoropentanesulfonic acid (PFPeS)	<0.28		1.8	0.28	ng/L		05/12/21 12:16	05/13/21 07:37	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: FB02-20210506

Lab Sample ID: 320-73382-19

Matrix: Water

Date Collected: 05/06/21 11:15
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	<0.53		1.8	0.53	ng/L	05/12/21 12:16	05/13/21 07:37		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.18		1.8	0.18	ng/L	05/12/21 12:16	05/13/21 07:37		1
Perfluorooctanesulfonic acid (PFOS)	<0.50		1.8	0.50	ng/L	05/12/21 12:16	05/13/21 07:37		1
Perfluorononanesulfonic acid (PFNS)	<0.34		1.8	0.34	ng/L	05/12/21 12:16	05/13/21 07:37		1
Perfluorodecanesulfonic acid (PFDS)	<0.29		1.8	0.29	ng/L	05/12/21 12:16	05/13/21 07:37		1
Perfluorododecanesulfonic acid (PFDoS)	<0.89		1.8	0.89	ng/L	05/12/21 12:16	05/13/21 07:37		1
Perfluorooctanesulfonamide (FOSA)	<0.90		1.8	0.90	ng/L	05/12/21 12:16	05/13/21 07:37		1
NEtFOSA	<0.80		1.8	0.80	ng/L	05/12/21 12:16	05/13/21 07:37		1
NMeFOSA	<0.40		1.8	0.40	ng/L	05/12/21 12:16	05/13/21 07:37		1
NMeFOSAA	<1.1		4.6	1.1	ng/L	05/12/21 12:16	05/13/21 07:37		1
NETFOSAA	<1.2		4.6	1.2	ng/L	05/12/21 12:16	05/13/21 07:37		1
NMeFOSE	<1.3		3.7	1.3	ng/L	05/12/21 12:16	05/13/21 07:37		1
NEtFOSE	<0.78		1.8	0.78	ng/L	05/12/21 12:16	05/13/21 07:37		1
4:2 FTS	<0.22		1.8	0.22	ng/L	05/12/21 12:16	05/13/21 07:37		1
6:2 FTS	<2.3		4.6	2.3	ng/L	05/12/21 12:16	05/13/21 07:37		1
8:2 FTS	<0.42		1.8	0.42	ng/L	05/12/21 12:16	05/13/21 07:37		1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.37		1.8	0.37	ng/L	05/12/21 12:16	05/13/21 07:37		1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.4		3.7	1.4	ng/L	05/12/21 12:16	05/13/21 07:37		1
F-53B Major	<0.22		1.8	0.22	ng/L	05/12/21 12:16	05/13/21 07:37		1
F-53B Minor	<0.29		1.8	0.29	ng/L	05/12/21 12:16	05/13/21 07:37		1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
13C4 PFBA	86		25 - 150			05/12/21 12:16	05/13/21 07:37		1
13C5 PFPeA	80		25 - 150			05/12/21 12:16	05/13/21 07:37		1
13C2 PFHxA	100		25 - 150			05/12/21 12:16	05/13/21 07:37		1
13C4 PFHpA	89		25 - 150			05/12/21 12:16	05/13/21 07:37		1
13C4 PFOA	94		25 - 150			05/12/21 12:16	05/13/21 07:37		1
13C5 PFNA	91		25 - 150			05/12/21 12:16	05/13/21 07:37		1
13C2 PFDA	98		25 - 150			05/12/21 12:16	05/13/21 07:37		1
13C2 PFUnA	104		25 - 150			05/12/21 12:16	05/13/21 07:37		1
13C2 PFDoA	94		25 - 150			05/12/21 12:16	05/13/21 07:37		1
13C2 PFTeDA	91		25 - 150			05/12/21 12:16	05/13/21 07:37		1
13C3 PFBS	80		25 - 150			05/12/21 12:16	05/13/21 07:37		1
18O2 PFHxS	91		25 - 150			05/12/21 12:16	05/13/21 07:37		1
13C4 PFOS	95		25 - 150			05/12/21 12:16	05/13/21 07:37		1
13C8 FOSA	92		10 - 150			05/12/21 12:16	05/13/21 07:37		1
d3-NMeFOSAA	99		25 - 150			05/12/21 12:16	05/13/21 07:37		1
d5-NEtFOSAA	112		25 - 150			05/12/21 12:16	05/13/21 07:37		1
d-N-MeFOSA-M	65		10 - 150			05/12/21 12:16	05/13/21 07:37		1
d-N-EtFOSA-M	67		10 - 150			05/12/21 12:16	05/13/21 07:37		1
d7-N-MeFOSE-M	91		10 - 150			05/12/21 12:16	05/13/21 07:37		1
d9-N-EtFOSE-M	85		10 - 150			05/12/21 12:16	05/13/21 07:37		1
M2-4:2 FTS	69		25 - 150			05/12/21 12:16	05/13/21 07:37		1
M2-6:2 FTS	113		25 - 150			05/12/21 12:16	05/13/21 07:37		1
M2-8:2 FTS	126		25 - 150			05/12/21 12:16	05/13/21 07:37		1
13C3 HFPO-DA	87		25 - 150			05/12/21 12:16	05/13/21 07:37		1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: FB03-20210506

Lab Sample ID: 320-73382-20

Matrix: Water

Date Collected: 05/06/21 11:35
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<2.1		4.3	2.1	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluoropentanoic acid (PFPeA)	<0.43		1.7	0.43	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorohexanoic acid (PFHxA)	<0.50		1.7	0.50	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluoroheptanoic acid (PFHpA)	<0.22		1.7	0.22	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorooctanoic acid (PFOA)	<0.74		1.7	0.74	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorononanoic acid (PFNA)	<0.23		1.7	0.23	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorodecanoic acid (PFDA)	<0.27		1.7	0.27	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluoroundecanoic acid (PFUnA)	<0.96		1.7	0.96	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorododecanoic acid (PFDoA)	<0.48		1.7	0.48	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorotridecanoic acid (PFTriA)	<1.1		1.7	1.1	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorotetradecanoic acid (PFTeA)	<0.63		1.7	0.63	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorobutanesulfonic acid (PFBS)	<0.17		1.7	0.17	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluoropentanesulfonic acid (PPeS)	<0.26		1.7	0.26	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorohexanesulfonic acid (PFHxS)	<0.50		1.7	0.50	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.17		1.7	0.17	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorooctanesulfonic acid (PFOS)	<0.47		1.7	0.47	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorononanesulfonic acid (PFNS)	<0.32		1.7	0.32	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorodecanesulfonic acid (PFDS)	<0.28		1.7	0.28	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorododecanesulfonic acid (PFDoS)	<0.84		1.7	0.84	ng/L	05/12/21 12:16	05/13/21 08:05		1
Perfluorooctanesulfonamide (FOSA)	<0.85		1.7	0.85	ng/L	05/12/21 12:16	05/13/21 08:05		1
NEtFOSA	<0.76		1.7	0.76	ng/L	05/12/21 12:16	05/13/21 08:05		1
NMeFOSA	<0.37		1.7	0.37	ng/L	05/12/21 12:16	05/13/21 08:05		1
NMeFOSAA	<1.0		4.3	1.0	ng/L	05/12/21 12:16	05/13/21 08:05		1
NEtFOSAA	<1.1		4.3	1.1	ng/L	05/12/21 12:16	05/13/21 08:05		1
NMeFOSE	<1.2		3.5	1.2	ng/L	05/12/21 12:16	05/13/21 08:05		1
NEtFOSE	<0.74		1.7	0.74	ng/L	05/12/21 12:16	05/13/21 08:05		1
4:2 FTS	<0.21		1.7	0.21	ng/L	05/12/21 12:16	05/13/21 08:05		1
6:2 FTS	<2.2		4.3	2.2	ng/L	05/12/21 12:16	05/13/21 08:05		1
8:2 FTS	<0.40		1.7	0.40	ng/L	05/12/21 12:16	05/13/21 08:05		1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.35		1.7	0.35	ng/L	05/12/21 12:16	05/13/21 08:05		1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.3		3.5	1.3	ng/L	05/12/21 12:16	05/13/21 08:05		1
F-53B Major	<0.21		1.7	0.21	ng/L	05/12/21 12:16	05/13/21 08:05		1
F-53B Minor	<0.28		1.7	0.28	ng/L	05/12/21 12:16	05/13/21 08:05		1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	87		25 - 150				05/12/21 12:16	05/13/21 08:05	1
13C5 PFPeA	86		25 - 150				05/12/21 12:16	05/13/21 08:05	1
13C2 PFHxA	93		25 - 150				05/12/21 12:16	05/13/21 08:05	1
13C4 PFHpA	89		25 - 150				05/12/21 12:16	05/13/21 08:05	1
13C4 PFOA	85		25 - 150				05/12/21 12:16	05/13/21 08:05	1
13C5 PFNA	93		25 - 150				05/12/21 12:16	05/13/21 08:05	1
13C2 PFDA	92		25 - 150				05/12/21 12:16	05/13/21 08:05	1
13C2 PFUnA	99		25 - 150				05/12/21 12:16	05/13/21 08:05	1
13C2 PFDoA	90		25 - 150				05/12/21 12:16	05/13/21 08:05	1
13C2 PFTeDA	87		25 - 150				05/12/21 12:16	05/13/21 08:05	1
13C3 PFBS	80		25 - 150				05/12/21 12:16	05/13/21 08:05	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: FB03-20210506
Date Collected: 05/06/21 11:35
Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-20
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
18O2 PFHxS	86		25 - 150	05/12/21 12:16	05/13/21 08:05	1
13C4 PFOS	89		25 - 150	05/12/21 12:16	05/13/21 08:05	1
13C8 FOSA	85		10 - 150	05/12/21 12:16	05/13/21 08:05	1
d3-NMeFOSAA	111		25 - 150	05/12/21 12:16	05/13/21 08:05	1
d5-NEtFOSAA	110		25 - 150	05/12/21 12:16	05/13/21 08:05	1
d-N-MeFOSA-M	67		10 - 150	05/12/21 12:16	05/13/21 08:05	1
d-N-EtFOSA-M	68		10 - 150	05/12/21 12:16	05/13/21 08:05	1
d7-N-MeFOSE-M	90		10 - 150	05/12/21 12:16	05/13/21 08:05	1
d9-N-EtFOSE-M	86		10 - 150	05/12/21 12:16	05/13/21 08:05	1
M2-4:2 FTS	69		25 - 150	05/12/21 12:16	05/13/21 08:05	1
M2-6:2 FTS	88		25 - 150	05/12/21 12:16	05/13/21 08:05	1
M2-8:2 FTS	117		25 - 150	05/12/21 12:16	05/13/21 08:05	1
13C3 HFPO-DA	84		25 - 150	05/12/21 12:16	05/13/21 08:05	1

Isotope Dilution Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Liquid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
320-73382-10	POLYMER-1-20210506	4 *5-	20 *5-	41	49	58	69	63	53
320-73382-10 - RE	POLYMER-1-20210506	62							
320-73382-11	POLYMER-2-20210506	6 *5-	27	40	42	58	56	55	52
320-73382-11 - RE	POLYMER-2-20210506	44							
320-73382-12	POLYMER-3-20210506	10 *5-	43	66	63	75	72	67	72
320-73382-12 - RE	POLYMER-3-20210506								
320-73382-16	DUP04-20210506	5 *5-	33	60	85	92	102	100	87
320-73382-16 - RE	DUP04-20210506	49							
LCS 320-490187/2-A	Lab Control Sample	93	82	85	93	90	87	88	93
LCS 320-492151/2-A	Lab Control Sample	93							
LCSD 320-490187/3-A	Lab Control Sample Dup	82	83	87	94	96	96	81	90
LCSD 320-492151/3-A	Lab Control Sample Dup	89							
MB 320-490187/1-A	Method Blank	84	89	93	96	91	86	93	88
MB 320-492151/1-A	Method Blank	97							
Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFDoA (25-150)	PFTDA (25-150)	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)
320-73382-10	POLYMER-1-20210506	47	34	41	51	52	59	52	44
320-73382-10 - RE	POLYMER-1-20210506								
320-73382-11	POLYMER-2-20210506	3 *5-	16 *5-	32	38	39	53	55	49
320-73382-11 - RE	POLYMER-2-20210506	69							
320-73382-12	POLYMER-3-20210506	44	33	50	57	57	60	70	63
320-73382-12 - RE	POLYMER-3-20210506								
320-73382-16	DUP04-20210506	59	37	63	77	77	82	90	87
320-73382-16 - RE	DUP04-20210506								
LCS 320-490187/2-A	Lab Control Sample	83	72	87	86	76	81	87	82
LCS 320-492151/2-A	Lab Control Sample	90							
LCSD 320-490187/3-A	Lab Control Sample Dup	79	74	79	90	81	78	87	82
LCSD 320-492151/3-A	Lab Control Sample Dup	69							
MB 320-490187/1-A	Method Blank	85	74	84	87	78	85	95	77
MB 320-492151/1-A	Method Blank	83							
Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		dMeFOSA (25-150)	dEtFOSA (25-150)	NMFNM (25-150)	NEFM (25-150)	M242FTS (25-150)	M262FTS (25-150)	M282FTS (25-150)	HFPODA (25-150)
320-73382-10	POLYMER-1-20210506	47	16 *5-	44	412 *5+	60	102	153 *5+	34
320-73382-10 - RE	POLYMER-1-20210506								
320-73382-11	POLYMER-2-20210506	3 *5-	5 *5-	15 *5-	22 *5-	92	142	137	37
320-73382-11 - RE	POLYMER-2-20210506	98	15 *5-		46				
320-73382-12	POLYMER-3-20210506	52	2 *5-	51	193 *5+	150	170 *5+	184 *5+	50
320-73382-12 - RE	POLYMER-3-20210506	61							
320-73382-16	DUP04-20210506	67	3 *5-	69	227 *5+	108	200 *5+	251 *5+	56
320-73382-16 - RE	DUP04-20210506		58						
LCS 320-490187/2-A	Lab Control Sample	73	73	93	91	76	108	106	80
LCS 320-492151/2-A	Lab Control Sample	85	73		70				
LCSD 320-490187/3-A	Lab Control Sample Dup	69	73	94	84	77	117	100	83
LCSD 320-492151/3-A	Lab Control Sample Dup	81	68		52				
MB 320-490187/1-A	Method Blank	67	67	86	70	92	131	113	78
MB 320-492151/1-A	Method Blank	60	56		66				

Eurofins TestAmerica, Sacramento

Isotope Dilution Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Matrix: Liquid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)								
		M102FTS								
320-73382-10	POLYMER-1-20210506	92								
320-73382-10 - RE	POLYMER-1-20210506									
320-73382-11	POLYMER-2-20210506	5								
320-73382-11 - RE	POLYMER-2-20210506									
320-73382-12	POLYMER-3-20210506	83								
320-73382-12 - RE	POLYMER-3-20210506									
320-73382-16	DUP04-20210506	127								
320-73382-16 - RE	DUP04-20210506									
LCS 320-490187/2-A	Lab Control Sample	83								
LCS 320-492151/2-A	Lab Control Sample									
LCSD 320-490187/3-A	Lab Control Sample Dup	77								
LCSD 320-492151/3-A	Lab Control Sample Dup									
MB 320-490187/1-A	Method Blank	86								
MB 320-492151/1-A	Method Blank									

Surrogate Legend

PFBA = 13C4 PFBA
 PFPeA = 13C5 PFPeA
 PFHxA = 13C2 PFHxA
 C4PFHA = 13C4 PFHpA
 PFOA = 13C4 PFOA
 PFNA = 13C5 PFNA
 PFDA = 13C2 PFDA
 PFUnA = 13C2 PFUnA
 PFDoA = 13C2 PFDoA
 PFTDA = 13C2 PFTeDA
 C3PFBS = 13C3 PFBS
 PFHxS = 18O2 PFHxS
 PFOS = 13C4 PFOS
 PFOSA = 13C8 FOSA
 d3NMFOS = d3-NMeFOSAA
 d5NEFOS = d5-NEtFOSAA
 dMeFOSA = d-N-MeFOSA-M
 dEtFOSA = d-N-EtFOSA-M
 NMFM = d7-N-MeFOSE-M
 NEFM = d9-N-EtFOSE-M
 M242FTS = M2-4:2 FTS
 M262FTS = M2-6:2 FTS
 M282FTS = M2-8:2 FTS
 HFPODA = 13C3 HFPO-DA
 M102FTS = 13C2 10:2 FTS

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)								
		PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)	
320-73382-7	BIOSOLID-S-A-20210506	72	75	73	63	77	82	66	81	
320-73382-7 MS	BIOSOLID-S-A-20210506	73	68	69	71	75	78	79	83	
320-73382-7 MSD	BIOSOLID-S-A-20210506	79	66	74	65	75	83	73	73	

Eurofins TestAmerica, Sacramento

Isotope Dilution Summary

Client: TRC Environmental Corporation.

Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Matrix: Solid

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	PFBA (25-150)	PPPeA (25-150)	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
320-73382-8	BIOSOLID-B-20210506	85	71	72	71	86	84	80	85
320-73382-9	STRUVITE-20210506	85	67	78	75	81	85	79	86
320-73382-15	DUP03-20210506	87	80	71	81	85	92	82	89
LCS 320-488275/2-A	Lab Control Sample	101	93	92	96	89	96	87	98
MB 320-488275/1-A	Method Blank	91	90	86	85	92	90	95	94
Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	PFDoA (25-150)	PFTDA (25-150)	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (10-150)	d3NMFOS (25-150)	d5NEFOS (25-150)
320-73382-7	BIOSOLID-A-20210506	53	31	67	65	68	67	63	65
320-73382-7 MS	BIOSOLID-A-20210506	52	34	69	77	73	60	72	76
320-73382-7 MSD	BIOSOLID-A-20210506	46	29	71	75	68	62	67	53
320-73382-8	BIOSOLID-B-20210506	68	44	71	79	84	69	81	93
320-73382-9	STRUVITE-20210506	82	76	71	80	82	73	90	94
320-73382-15	DUP03-20210506	70	50	76	69	81	69	91	80
LCS 320-488275/2-A	Lab Control Sample	95	82	95	95	93	84	95	114
MB 320-488275/1-A	Method Blank	93	83	81	84	89	90	94	101
Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	dMeFOSA (10-150)	dEtFOSA (10-150)	NMFNM (10-150)	NEFM (10-150)	M242FTS (25-150)	M262FTS (25-150)	M282FTS (25-150)	HFPODA (25-150)
320-73382-7	BIOSOLID-A-20210506	54	37	59	37	93	113	137	52
320-73382-7 MS	BIOSOLID-A-20210506	44	26	53	42	113	139	155 *5+	64
320-73382-7 MSD	BIOSOLID-A-20210506	48	26	40	50	99	131	159 *5+	66
320-73382-8	BIOSOLID-B-20210506	61	57	77	42	91	129	163 *5+	67
320-73382-9	STRUVITE-20210506	57	59	65	76	86	140	133	66
320-73382-15	DUP03-20210506	54	43	49	61	96	109	180 *5+	82
LCS 320-488275/2-A	Lab Control Sample	55	55	78	79	89	110	110	93
MB 320-488275/1-A	Method Blank	51	51	81	73	86	112	118	80

Surrogate Legend

PFBA = 13C4 PFBA
 PPPeA = 13C5 PPPeA
 PFHxA = 13C2 PFHxA
 C4PFHA = 13C4 PFHpA
 PFOA = 13C4 PFOA
 PFNA = 13C5 PFNA
 PFDA = 13C2 PFDA
 PFUnA = 13C2 PFUnA
 PFDoA = 13C2 PFDoA
 PFTDA = 13C2 PFTeDA
 C3PFBS = 13C3 PFBS
 PFHxS = 18O2 PFHxS
 PFOS = 13C4 PFOS
 PFOSA = 13C8 FOSA
 d3NMFOS = d3-NMeFOSAA
 d5NEFOS = d5-NEtFOSAA
 dMeFOSA = d-N-MeFOSA-M
 dEtFOSA = d-N-EtFOSA-M
 NMFNM = d7-N-MeFOSE-M
 NEFM = d9-N-EtFOSE-M
 M242FTS = M2-4:2 FTS

Eurofins TestAmerica, Sacramento

Isotope Dilution Summary

Client: TRC Environmental Corporation.

Job ID: 320-73382-1

Project/Site: MMSD PFAS

M262FTS = M2-6:2 FTS

M282FTS = M2-8:2 FTS

HFPODA = 13C3 HFPO-DA

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFBA (25-150)	PPeA (25-150)	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
320-73382-1	INFLUENT-02-20210506	46	60	56	70	73	69	43	37
320-73382-2	INFLUENT-07-20210506	48	63	64	77	78	73	49	40
320-73382-3	INFLUENT-08-20210506	46	59	62	72	73	68	43	33
320-73382-4	INFLUENT-11-20210506	41	54	51	62	61	55	33	28
320-73382-5	INFLUENT-18-20210506	45	59	35	63	62	60	41	36
320-73382-6	EFFLUENT-PERM-20210506	46	55	65	63	65	69	64	66
320-73382-13	DUP01-20210506	33	19 *5-	40	31	38	33	31	25
320-73382-14	DUP02-20210506	55	38	87	65	78	77	89	92
320-73382-17	EB01-20210504	75	68	87	77	80	83	83	93
320-73382-18	FB01-20210506	88	92	105	94	91	97	96	109
320-73382-19	FB02-20210506	86	80	100	89	94	91	98	104
320-73382-20	FB03-20210506	87	86	93	89	85	93	92	99
LCS 320-487831/2-A	Lab Control Sample	81	86	84	86	92	93	82	94
LCS 320-488328/2-A	Lab Control Sample	76	74	90	82	82	81	80	82
LCSD 320-487831/3-A	Lab Control Sample Dup	86	91	87	90	90	94	88	99
LCSD 320-488328/3-A	Lab Control Sample Dup	75	71	82	76	75	76	79	83
MB 320-487831/1-A	Method Blank	78	83	81	84	85	89	88	92
MB 320-488328/1-A	Method Blank	80	82	95	84	86	85	88	94
Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFDoA (25-150)	PFTDA (25-150)	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (10-150)	d3NMFOS (25-150)	d5NEFOS (25-150)
320-73382-1	INFLUENT-02-20210506	21 *5-	25	76	74	69	40	33	17 *5-
320-73382-2	INFLUENT-07-20210506	21 *5-	23 *5-	74	84	78	45	35	18 *5-
320-73382-3	INFLUENT-08-20210506	20 *5-	25	71	72	68	39	27	15 *5-
320-73382-4	INFLUENT-11-20210506	15 *5-	17 *5-	60	62	56	27	21 *5-	11 *5-
320-73382-5	INFLUENT-18-20210506	22 *5-	25	66	72	65	34	37	16 *5-
320-73382-6	EFFLUENT-PERM-20210506	59	38	68	71	68	69	66	66
320-73382-13	DUP01-20210506	18 *5-	22 *5-	29	34	32	22	22 *5-	13 *5-
320-73382-14	DUP02-20210506	83	54	55	74	85	79	88	87
320-73382-17	EB01-20210504	80	80	67	84	82	81	100	89
320-73382-18	FB01-20210506	94	93	87	88	89	92	113	115
320-73382-19	FB02-20210506	94	91	80	91	95	92	99	112
320-73382-20	FB03-20210506	90	87	80	86	89	85	111	110
LCS 320-487831/2-A	Lab Control Sample	80	79	81	87	88	89	96	94
LCS 320-488328/2-A	Lab Control Sample	79	76	72	74	75	76	98	91
LCSD 320-487831/3-A	Lab Control Sample Dup	88	79	85	87	90	93	100	97
LCSD 320-488328/3-A	Lab Control Sample Dup	75	74	66	72	70	72	88	89
MB 320-487831/1-A	Method Blank	84	78	82	87	85	92	94	95
MB 320-488328/1-A	Method Blank	84	83	69	76	78	80	107	94
Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		dMeFOSA (10-150)	dEtFOSA (10-150)	NMFM (10-150)	NEFM (10-150)	M242FTS (25-150)	M262FTS (25-150)	M282FTS (25-150)	HFPODA (25-150)
320-73382-1	INFLUENT-02-20210506	29	24	27	21	120	142	61	66
320-73382-2	INFLUENT-07-20210506	32	26	28	20	141	146	65	73
320-73382-3	INFLUENT-08-20210506	28	21	29	18	137	122	54	65
320-73382-4	INFLUENT-11-20210506	20	17	21	16	140	122	51	54

Eurofins TestAmerica, Sacramento

Isotope Dilution Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		dMeFOSA (10-150)	dEtFOSA (10-150)	NMFm (10-150)	NEFM (10-150)	M242FTS (25-150)	M262FTS (25-150)	M282FTS (25-150)	HFPODA (25-150)
320-73382-5	INFLUENT-18-20210506	28	29	24	27	86	137	69	61
320-73382-6	EFFLUENT-PERM-20210506	61	58	60	61	127	113	85	59
320-73382-13	DUP01-20210506	20	18	15	15	56	59	40	31
320-73382-14	DUP02-20210506	70	59	69	62	104	113	128	71
320-73382-17	EB01-20210504	61	60	74	75	61	88	98	78
320-73382-18	FB01-20210506	68	67	97	86	77	93	121	86
320-73382-19	FB02-20210506	65	67	91	85	69	113	126	87
320-73382-20	FB03-20210506	67	68	90	86	69	88	117	84
LCS 320-487831/2-A	Lab Control Sample	69	68	85	86	103	104	95	82
LCS 320-488328/2-A	Lab Control Sample	52	54	75	72	66	78	97	76
LCSD 320-487831/3-A	Lab Control Sample Dup	76	70	85	86	106	104	93	85
LCSD 320-488328/3-A	Lab Control Sample Dup	53	50	73	70	61	76	89	71
MB 320-487831/1-A	Method Blank	69	68	82	83	103	108	104	78
MB 320-488328/1-A	Method Blank	59	61	83	83	72	87	110	81

Surrogate Legend

PFBA = 13C4 PFBA
 PPfPeA = 13C5 PPfPeA
 PFHxA = 13C2 PFHxA
 C4PFHA = 13C4 PFHpA
 PFOA = 13C4 PFOA
 PFNA = 13C5 PFNA
 PFDA = 13C2 PFDA
 PFUnA = 13C2 PFUnA
 PFDoA = 13C2 PFDoA
 PFTDA = 13C2 PFTeDA
 C3PFBS = 13C3 PFBS
 PFHxS = 18O2 PFHxS
 PFOS = 13C4 PFOS
 PFOSA = 13C8 FOSA
 d3NMFOS = d3-NMeFOSAA
 d5NEFOS = d5-NEtFOSAA
 dMeFOSA = d-N-MeFOSA-M
 dEtFOSA = d-N-EtFOSA-M
 NMFm = d7-N-MeFOSE-M
 NEFM = d9-N-EtFOSE-M
 M242FTS = M2-4:2 FTS
 M262FTS = M2-6:2 FTS
 M282FTS = M2-8:2 FTS
 HFPODA = 13C3 HFPO-DA

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-487831/1-A

Matrix: Water

Analysis Batch: 488134

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 487831

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<2.4		5.0	2.4	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluoropentanoic acid (PFPeA)	<0.49		2.0	0.49	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluorohexanoic acid (PFHxA)	<0.58		2.0	0.58	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluoroheptanoic acid (PFHpA)	<0.25		2.0	0.25	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluorooctanoic acid (PFOA)	<0.85		2.0	0.85	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluorononanoic acid (PFNA)	<0.27		2.0	0.27	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluorodecanoic acid (PFDA)	<0.31		2.0	0.31	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluoroundecanoic acid (PFUnA)	<1.1		2.0	1.1	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluorododecanoic acid (PFDoA)	<0.55		2.0	0.55	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluorotridecanoic acid (PFTriA)	<1.3		2.0	1.3	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluorotetradecanoic acid (PFTeA)	<0.73		2.0	0.73	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluorobutanesulfonic acid (PFBS)	<0.20		2.0	0.20	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluoropentanesulfonic acid (PFPeS)	<0.30		2.0	0.30	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluorohexanesulfonic acid (PFHxS)	<0.57		2.0	0.57	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.19		2.0	0.19	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluorooctanesulfonic acid (PFOS)	<0.54		2.0	0.54	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluoronananesulfonic acid (PFNS)	<0.37		2.0	0.37	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluorodecanesulfonic acid (PFDS)	<0.32		2.0	0.32	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluorododecanesulfonic acid (PFDoS)	<0.97		2.0	0.97	ng/L	05/11/21 04:47	05/12/21 04:54		1
Perfluorooctanesulfonamide (FOSA)	<0.98		2.0	0.98	ng/L	05/11/21 04:47	05/12/21 04:54		1
NEtFOSA	<0.87		2.0	0.87	ng/L	05/11/21 04:47	05/12/21 04:54		1
NMeFOSA	<0.43		2.0	0.43	ng/L	05/11/21 04:47	05/12/21 04:54		1
NMeFOSAA	<1.2		5.0	1.2	ng/L	05/11/21 04:47	05/12/21 04:54		1
NETFOSAA	<1.3		5.0	1.3	ng/L	05/11/21 04:47	05/12/21 04:54		1
NMeFOSE	<1.4		4.0	1.4	ng/L	05/11/21 04:47	05/12/21 04:54		1
NEtFOSE	<0.85		2.0	0.85	ng/L	05/11/21 04:47	05/12/21 04:54		1
4:2 FTS	<0.24		2.0	0.24	ng/L	05/11/21 04:47	05/12/21 04:54		1
6:2 FTS	<2.5		5.0	2.5	ng/L	05/11/21 04:47	05/12/21 04:54		1
8:2 FTS	<0.46		2.0	0.46	ng/L	05/11/21 04:47	05/12/21 04:54		1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.40		2.0	0.40	ng/L	05/11/21 04:47	05/12/21 04:54		1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.5		4.0	1.5	ng/L	05/11/21 04:47	05/12/21 04:54		1
F-53B Major	<0.24		2.0	0.24	ng/L	05/11/21 04:47	05/12/21 04:54		1
F-53B Minor	<0.32		2.0	0.32	ng/L	05/11/21 04:47	05/12/21 04:54		1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	78		25 - 150	05/11/21 04:47	05/12/21 04:54	1
13C5 PFPeA	83		25 - 150	05/11/21 04:47	05/12/21 04:54	1
13C2 PFHxA	81		25 - 150	05/11/21 04:47	05/12/21 04:54	1
13C4 PFHpA	84		25 - 150	05/11/21 04:47	05/12/21 04:54	1
13C4 PFOA	85		25 - 150	05/11/21 04:47	05/12/21 04:54	1
13C5 PFNA	89		25 - 150	05/11/21 04:47	05/12/21 04:54	1
13C2 PFDA	88		25 - 150	05/11/21 04:47	05/12/21 04:54	1
13C2 PFUnA	92		25 - 150	05/11/21 04:47	05/12/21 04:54	1
13C2 PFDoA	84		25 - 150	05/11/21 04:47	05/12/21 04:54	1
13C2 PFTeDA	78		25 - 150	05/11/21 04:47	05/12/21 04:54	1

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QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-487831/1-A

Matrix: Water

Analysis Batch: 488134

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 487831

Isotope Dilution	MB	MB	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 PFBS		82	82		25 - 150	05/11/21 04:47	05/12/21 04:54	1
18O2 PFHxS		87	87		25 - 150	05/11/21 04:47	05/12/21 04:54	1
13C4 PFOS		85	85		25 - 150	05/11/21 04:47	05/12/21 04:54	1
13C8 FOSA		92	92		10 - 150	05/11/21 04:47	05/12/21 04:54	1
d3-NMeFOSAA		94	94		25 - 150	05/11/21 04:47	05/12/21 04:54	1
d5-NEtFOSAA		95	95		25 - 150	05/11/21 04:47	05/12/21 04:54	1
d-N-MeFOSA-M		69	69		10 - 150	05/11/21 04:47	05/12/21 04:54	1
d-N-EtFOSA-M		68	68		10 - 150	05/11/21 04:47	05/12/21 04:54	1
d7-N-MeFOSE-M		82	82		10 - 150	05/11/21 04:47	05/12/21 04:54	1
d9-N-EtFOSE-M		83	83		10 - 150	05/11/21 04:47	05/12/21 04:54	1
M2-4:2 FTS		103	103		25 - 150	05/11/21 04:47	05/12/21 04:54	1
M2-6:2 FTS		108	108		25 - 150	05/11/21 04:47	05/12/21 04:54	1
M2-8:2 FTS		104	104		25 - 150	05/11/21 04:47	05/12/21 04:54	1
13C3 HFPO-DA		78	78		25 - 150	05/11/21 04:47	05/12/21 04:54	1

Lab Sample ID: LCS 320-487831/2-A

Matrix: Water

Analysis Batch: 488134

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 487831

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	Limts	%Rec.
		Result	Qualifier					
Perfluorobutanoic acid (PFBA)	40.0	41.0		ng/L		102	60 - 135	
Perfluoropentanoic acid (PFPeA)	40.0	41.5		ng/L		104	60 - 135	
Perfluorohexanoic acid (PFHxA)	40.0	42.1		ng/L		105	60 - 135	
Perfluoroheptanoic acid (PFHpA)	40.0	43.8		ng/L		110	60 - 135	
Perfluorooctanoic acid (PFOA)	40.0	40.8		ng/L		102	60 - 135	
Perfluorononanoic acid (PFNA)	40.0	40.9		ng/L		102	60 - 135	
Perfluorodecanoic acid (PFDA)	40.0	40.2		ng/L		101	60 - 135	
Perfluoroundecanoic acid (PFUnA)	40.0	35.8		ng/L		90	60 - 135	
Perfluorododecanoic acid (PFDa)	40.0	47.1		ng/L		118	60 - 135	
Perfluorotridecanoic acid (PFTriA)	40.0	44.1		ng/L		110	60 - 135	
Perfluorotetradecanoic acid (PFTeA)	40.0	43.9		ng/L		110	60 - 135	
Perfluorobutanesulfonic acid (PFBS)	35.4	36.2		ng/L		102	60 - 135	
Perfluoropentanesulfonic acid (PFPeS)	37.5	44.4		ng/L		118	60 - 135	
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.6		ng/L		98	60 - 135	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	39.2		ng/L		103	60 - 135	
Perfluorooctanesulfonic acid (PFOS)	37.1	37.5		ng/L		101	60 - 135	
Perfluorononanesulfonic acid (PFNS)	38.4	38.9		ng/L		101	60 - 135	
Perfluorodecanesulfonic acid (PFDS)	38.6	34.9		ng/L		90	60 - 135	
Perfluorododecanesulfonic acid (PFDaS)	38.7	38.6		ng/L		100	60 - 135	

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-487831/2-A

Matrix: Water

Analysis Batch: 488134

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 487831

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits
Perfluorooctanesulfonamide (FOSA)	40.0	41.1		ng/L	103	60 - 135		
NEtFOSA	40.0	42.3		ng/L	106	60 - 135		
NMeFOSA	40.0	44.4		ng/L	111	60 - 135		
NMeFOSAA	40.0	43.0		ng/L	107	60 - 135		
NEtFOSAA	40.0	35.1		ng/L	88	60 - 135		
NMeFOSE	40.0	46.7		ng/L	117	60 - 135		
NEtFOSE	40.0	41.3		ng/L	103	60 - 135		
4:2 FTS	37.4	36.3		ng/L	97	60 - 135		
6:2 FTS	37.9	39.8		ng/L	105	60 - 135		
8:2 FTS	38.3	41.3		ng/L	108	60 - 135		
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.7	37.5		ng/L	99	60 - 135		
Hexafluoropropylene Oxide	40.0	44.4		ng/L	111	60 - 135		
Dimer Acid (HFPO-DA)								
F-53B Major	37.3	35.7		ng/L	96	60 - 135		
F-53B Minor	37.7	34.6		ng/L	92	60 - 135		

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFBA	81		25 - 150
13C5 PFPeA	86		25 - 150
13C2 PFHxA	84		25 - 150
13C4 PFHpA	86		25 - 150
13C4 PFOA	92		25 - 150
13C5 PFNA	93		25 - 150
13C2 PFDA	82		25 - 150
13C2 PFUnA	94		25 - 150
13C2 PFDaO	80		25 - 150
13C2 PFTeDA	79		25 - 150
13C3 PFBS	81		25 - 150
18O2 PFHxS	87		25 - 150
13C4 PFOS	88		25 - 150
13C8 FOSA	89		10 - 150
d3-NMeFOSAA	96		25 - 150
d5-NEtFOSAA	94		25 - 150
d-N-MeFOSA-M	69		10 - 150
d-N-EtFOSA-M	68		10 - 150
d7-N-MeFOSE-M	85		10 - 150
d9-N-EtFOSE-M	86		10 - 150
M2-4:2 FTS	103		25 - 150
M2-6:2 FTS	104		25 - 150
M2-8:2 FTS	95		25 - 150
13C3 HFPO-DA	82		25 - 150

Lab Sample ID: LCSD 320-487831/3-A

Matrix: Water

Analysis Batch: 488134

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 487831

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec.	RPD
Perfluorobutanoic acid (PFBA)	40.0	40.4		ng/L	101	60 - 135		2

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-487831/3-A

Matrix: Water

Analysis Batch: 488134

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 487831

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)	40.0	41.7		ng/L		104	60 - 135	0	30
Perfluorohexanoic acid (PFHxA)	40.0	43.3		ng/L		108	60 - 135	3	30
Perfluoroheptanoic acid (PFHpA)	40.0	45.0		ng/L		112	60 - 135	3	30
Perfluorooctanoic acid (PFOA)	40.0	42.1		ng/L		105	60 - 135	3	30
Perfluorononanoic acid (PFNA)	40.0	41.3		ng/L		103	60 - 135	1	30
Perfluorodecanoic acid (PFDA)	40.0	37.4		ng/L		93	60 - 135	7	30
Perfluoroundecanoic acid (PFUnA)	40.0	35.1		ng/L		88	60 - 135	2	30
Perfluorododecanoic acid (PFDoA)	40.0	43.4		ng/L		109	60 - 135	8	30
Perfluorotridecanoic acid (PFTriA)	40.0	38.3		ng/L		96	60 - 135	14	30
Perfluorotetradecanoic acid (PFTeA)	40.0	45.8		ng/L		114	60 - 135	4	30
Perfluorobutanesulfonic acid (PFBS)	35.4	36.8		ng/L		104	60 - 135	2	30
Perfluoropentanesulfonic acid (PFPeS)	37.5	43.3		ng/L		115	60 - 135	3	30
Perfluorohexanesulfonic acid (PFHxS)	36.4	37.0		ng/L		102	60 - 135	4	30
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	38.1		ng/L		100	60 - 135	3	30
Perfluorooctanesulfonic acid (PFOS)	37.1	36.9		ng/L		100	60 - 135	1	30
Perfluorononanesulfonic acid (PFNS)	38.4	39.1		ng/L		102	60 - 135	1	30
Perfluorodecanesulfonic acid (PFDS)	38.6	34.9		ng/L		90	60 - 135	0	30
Perfluorododecanesulfonic acid (PFDoS)	38.7	39.2		ng/L		101	60 - 135	1	30
Perfluoroctanesulfonamide (FOSA)	40.0	39.1		ng/L		98	60 - 135	5	30
NEtFOSA	40.0	40.7		ng/L		102	60 - 135	4	30
NMeFOSA	40.0	44.3		ng/L		111	60 - 135	0	30
NMeFOSAA	40.0	45.9		ng/L		115	60 - 135	7	30
NEtFOSAA	40.0	37.3		ng/L		93	60 - 135	6	30
NMeFOSE	40.0	46.4		ng/L		116	60 - 135	1	30
NEtFOSE	40.0	38.3		ng/L		96	60 - 135	8	30
4:2 FTS	37.4	35.8		ng/L		96	60 - 135	2	30
6:2 FTS	37.9	39.9		ng/L		105	60 - 135	0	30
8:2 FTS	38.3	41.9		ng/L		109	60 - 135	2	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.7	38.7		ng/L		103	60 - 135	3	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	40.0	43.1		ng/L		108	60 - 135	3	30
F-53B Major	37.3	36.9		ng/L		99	60 - 135	3	30
F-53B Minor	37.7	33.2		ng/L		88	60 - 135	4	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C4 PFBA	86		25 - 150
13C5 PFPeA	91		25 - 150
13C2 PFHxA	87		25 - 150

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-487831/3-A

Client Sample ID: Lab Control Sample Dup

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 488134

Prep Batch: 487831

<i>Isotope Dilution</i>	<i>LCSD</i>	<i>LCSD</i>	<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
13C4 PFHpA	90		25 - 150
13C4 PFOA	90		25 - 150
13C5 PFNA	94		25 - 150
13C2 PFDA	88		25 - 150
13C2 PFUnA	99		25 - 150
13C2 PFDoA	88		25 - 150
13C2 PFTeDA	79		25 - 150
13C3 PFBS	85		25 - 150
18O2 PFHxS	87		25 - 150
13C4 PFOS	90		25 - 150
13C8 FOSA	93		10 - 150
d3-NMeFOSAA	100		25 - 150
d5-NEtFOSAA	97		25 - 150
d-N-MeFOSA-M	76		10 - 150
d-N-EtFOSA-M	70		10 - 150
d7-N-MeFOSE-M	85		10 - 150
d9-N-EtFOSE-M	86		10 - 150
M2-4:2 FTS	106		25 - 150
M2-6:2 FTS	104		25 - 150
M2-8:2 FTS	93		25 - 150
13C3 HFPO-DA	85		25 - 150

Lab Sample ID: MB 320-488275/1-A

Client Sample ID: Method Blank

Matrix: Solid

Prep Type: Total/NA

Analysis Batch: 488922

Prep Batch: 488275

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorobutanoic acid (PFBA)	<0.028		0.20	0.028	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluoropentanoic acid (PPPeA)	<0.077		0.20	0.077	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluorohexanoic acid (PFHxA)	<0.042		0.20	0.042	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluoroheptanoic acid (PFHpA)	<0.029		0.20	0.029	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluorooctanoic acid (PFOA)	<0.086		0.20	0.086	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluorononanoic acid (PFNA)	<0.036		0.20	0.036	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluorodecanoic acid (PFDA)	<0.022		0.20	0.022	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluoroundecanoic acid (PFUnA)	<0.036		0.20	0.036	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluorododecanoic acid (PFDoA)	<0.067		0.20	0.067	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluorotridecanoic acid (PFTriA)	<0.051		0.20	0.051	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluorotetradecanoic acid (PFTeA)	<0.054		0.20	0.054	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluorobutanesulfonic acid (PFBS)	<0.025		0.20	0.025	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluoropentanesulfonic acid (PFPeS)	<0.020		0.20	0.020	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluorohexanesulfonic acid (PFHxS)	<0.031		0.20	0.031	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.035		0.20	0.035	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluorooctanesulfonic acid (PFOS)	<0.20		0.50	0.20	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluoronananesulfonic acid (PFNS)	<0.020		0.20	0.020	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluorodecanesulfonic acid (PFDS)	<0.039		0.20	0.039	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluorododecanesulfonic acid (PFDoS)	<0.060		0.20	0.060	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Perfluorooctanesulfonamide (FOSA)	<0.082		0.20	0.082	ug/Kg		05/12/21 11:27	05/14/21 02:56	1

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-488275/1-A

Matrix: Solid

Analysis Batch: 488922

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 488275

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
NETFOSA	<0.024		0.20	0.024	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
NMeFOSA	<0.041		0.20	0.041	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
NMeFOSAA	<0.39		2.0	0.39	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
NEtFOSAA	<0.37		2.0	0.37	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
NMeFOSE	<0.071		0.20	0.071	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
NETFOSE	<0.036		0.20	0.036	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
4:2 FTS	<0.37		2.0	0.37	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
6:2 FTS	<0.15		2.0	0.15	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
8:2 FTS	<0.25		2.0	0.25	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.018		0.20	0.018	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<0.11		0.25	0.11	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
F-53B Major	<0.027		0.20	0.027	ug/Kg		05/12/21 11:27	05/14/21 02:56	1
F-53B Minor	<0.022		0.20	0.022	ug/Kg		05/12/21 11:27	05/14/21 02:56	1

Isotope Dilution	MB	MB	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	91		25 - 150			05/12/21 11:27	05/14/21 02:56	1
13C5 PFPeA	90		25 - 150			05/12/21 11:27	05/14/21 02:56	1
13C2 PFHxA	86		25 - 150			05/12/21 11:27	05/14/21 02:56	1
13C4 PFHpA	85		25 - 150			05/12/21 11:27	05/14/21 02:56	1
13C4 PFOA	92		25 - 150			05/12/21 11:27	05/14/21 02:56	1
13C5 PFNA	90		25 - 150			05/12/21 11:27	05/14/21 02:56	1
13C2 PFDA	95		25 - 150			05/12/21 11:27	05/14/21 02:56	1
13C2 PFUnA	94		25 - 150			05/12/21 11:27	05/14/21 02:56	1
13C2 PFDoA	93		25 - 150			05/12/21 11:27	05/14/21 02:56	1
13C2 PFTeDA	83		25 - 150			05/12/21 11:27	05/14/21 02:56	1
13C3 PFBS	81		25 - 150			05/12/21 11:27	05/14/21 02:56	1
18O2 PFHxS	84		25 - 150			05/12/21 11:27	05/14/21 02:56	1
13C4 PFOS	89		25 - 150			05/12/21 11:27	05/14/21 02:56	1
13C8 FOSA	90		10 - 150			05/12/21 11:27	05/14/21 02:56	1
d3-NMeFOSAA	94		25 - 150			05/12/21 11:27	05/14/21 02:56	1
d5-NEtFOSAA	101		25 - 150			05/12/21 11:27	05/14/21 02:56	1
d-N-MeFOSA-M	51		10 - 150			05/12/21 11:27	05/14/21 02:56	1
d-N-EtFOSA-M	51		10 - 150			05/12/21 11:27	05/14/21 02:56	1
d7-N-MeFOSE-M	81		10 - 150			05/12/21 11:27	05/14/21 02:56	1
d9-N-EtFOSE-M	73		10 - 150			05/12/21 11:27	05/14/21 02:56	1
M2-4:2 FTS	86		25 - 150			05/12/21 11:27	05/14/21 02:56	1
M2-6:2 FTS	112		25 - 150			05/12/21 11:27	05/14/21 02:56	1
M2-8:2 FTS	118		25 - 150			05/12/21 11:27	05/14/21 02:56	1
13C3 HFPO-DA	80		25 - 150			05/12/21 11:27	05/14/21 02:56	1

Lab Sample ID: LCS 320-488275/2-A

Matrix: Solid

Analysis Batch: 488922

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 488275

Analyte	Spike	LCS	LCS	Unit	D	%Rec.	Limits
	Added	Result	Qualifier				
Perfluorobutanoic acid (PFBA)	2.00	2.05		ug/Kg		103	60 - 135
Perfluoropentanoic acid (PFPeA)	2.00	2.32		ug/Kg		116	60 - 135

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-488275/2-A

Matrix: Solid

Analysis Batch: 488922

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 488275

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.26		ug/Kg		113	60 - 135	
Perfluoroheptanoic acid (PFHpA)	2.00	2.15		ug/Kg		108	60 - 135	
Perfluorooctanoic acid (PFOA)	2.00	2.31		ug/Kg		116	60 - 135	
Perfluorononanoic acid (PFNA)	2.00	2.22		ug/Kg		111	60 - 135	
Perfluorodecanoic acid (PFDA)	2.00	2.14		ug/Kg		107	60 - 135	
Perfluoroundecanoic acid (PFUnA)	2.00	2.09		ug/Kg		105	60 - 135	
Perfluorododecanoic acid (PFDoA)	2.00	1.99		ug/Kg		99	60 - 135	
Perfluorotridecanoic acid (PFTriA)	2.00	1.94		ug/Kg		97	60 - 135	
Perfluorotetradecanoic acid (PFTeA)	2.00	2.21		ug/Kg		110	60 - 135	
Perfluorobutanesulfonic acid (PFBS)	1.77	1.90		ug/Kg		107	60 - 135	
Perfluoropentanesulfonic acid (PFPeS)	1.88	1.78		ug/Kg		95	60 - 135	
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.89		ug/Kg		104	60 - 135	
Perfluoroheptanesulfonic Acid (PFHpS)	1.90	2.26		ug/Kg		119	60 - 135	
Perfluoroctanesulfonic acid (PFOS)	1.86	2.03		ug/Kg		109	60 - 135	
Perfluorononanesulfonic acid (PFNS)	1.92	1.88		ug/Kg		98	60 - 135	
Perfluorodecanesulfonic acid (PFDS)	1.93	1.90		ug/Kg		99	60 - 135	
Perfluorododecanesulfonic acid (PFDoS)	1.94	1.85		ug/Kg		95	60 - 135	
Perfluorooctanesulfonamide (FOSA)	2.00	2.27		ug/Kg		113	60 - 135	
NEtFOSA	2.00	2.00		ug/Kg		100	60 - 135	
NMeFOSA	2.00	2.35		ug/Kg		117	60 - 135	
NMeFOSAA	2.00	2.36		ug/Kg		118	60 - 135	
NEtFOSAA	2.00	2.08		ug/Kg		104	60 - 135	
NMeFOSE	2.00	1.88		ug/Kg		94	60 - 135	
NEtFOSE	2.00	1.85		ug/Kg		92	60 - 135	
4:2 FTS	1.87	1.97	J	ug/Kg		106	60 - 135	
6:2 FTS	1.90	1.89	J	ug/Kg		100	60 - 135	
8:2 FTS	1.92	2.10		ug/Kg		110	60 - 135	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.88	1.98		ug/Kg		105	60 - 135	
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	2.00	2.29		ug/Kg		114	60 - 135	
F-53B Major	1.86	2.01		ug/Kg		108	60 - 135	
F-53B Minor	1.88	1.87		ug/Kg		99	60 - 135	

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFBA	101		25 - 150
13C5 PFPeA	93		25 - 150
13C2 PFHxA	92		25 - 150
13C4 PFHpA	96		25 - 150

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-488275/2-A

Matrix: Solid

Analysis Batch: 488922

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 488275

<i>Isotope Dilution</i>	<i>LCS</i>	<i>LCS</i>	<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
13C4 PFOA	89		25 - 150
13C5 PFNA	96		25 - 150
13C2 PFDA	87		25 - 150
13C2 PFUnA	98		25 - 150
13C2 PFDoA	95		25 - 150
13C2 PFTeDA	82		25 - 150
13C3 PFBS	95		25 - 150
18O2 PFHxS	95		25 - 150
13C4 PFOS	93		25 - 150
13C8 FOSA	84		10 - 150
d3-NMeFOSAA	95		25 - 150
d5-NEtFOSAA	114		25 - 150
d-N-MeFOSA-M	55		10 - 150
d-N-EtFOSA-M	55		10 - 150
d7-N-MeFOSE-M	78		10 - 150
d9-N-EtFOSE-M	79		10 - 150
M2-4:2 FTS	89		25 - 150
M2-6:2 FTS	110		25 - 150
M2-8:2 FTS	110		25 - 150
13C3 HFPO-DA	93		25 - 150

Lab Sample ID: 320-73382-7 MS

Matrix: Solid

Analysis Batch: 489473

Client Sample ID: BIOSOLIDS-A-20210506

Prep Type: Total/NA

Prep Batch: 488275

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec.	Limits
	Result	Qualifier	Added	Result	Qualifier				
Perfluorobutanoic acid (PFBA)	3.4	J	7.33	12.0		ug/Kg	⊗	117	70 - 130
Perfluoropentanoic acid (PFPeA)	11	F1	7.33	21.4	F1	ug/Kg	⊗	143	70 - 130
Perfluorohexanoic acid (PFHxA)	29	F1	7.33	51.4	F1	ug/Kg	⊗	302	70 - 130
Perfluoroheptanoic acid (PFHpA)	<0.96	F1	7.33	10.1	F1	ug/Kg	⊗	138	70 - 130
Perfluoroctanoic acid (PFOA)	16	F1	7.33	29.4	F1	ug/Kg	⊗	184	70 - 130
Perfluorononanoic acid (PFNA)	1.3	J F1	7.33	11.0	F1	ug/Kg	⊗	132	70 - 130
Perfluorodecanoic acid (PFDA)	15	F1	7.33	18.6	F1	ug/Kg	⊗	44	70 - 130
Perfluoroundecanoic acid (PFUnA)	<1.2	F1	7.33	9.60	F1	ug/Kg	⊗	131	70 - 130
Perfluorododecanoic acid (PFDoA)	5.4	J	7.33	13.5		ug/Kg	⊗	111	70 - 130
Perfluorotridecanoic acid (PFTriA)	<1.7		7.33	5.91	J	ug/Kg	⊗	81	70 - 130
Perfluorotetradecanoic acid (PFTeA)	<1.8	F1	7.33	9.80	F1	ug/Kg	⊗	134	70 - 130
Perfluorobutanesulfonic acid (PFBS)	<0.83	F1	6.48	9.12	F1	ug/Kg	⊗	141	70 - 130
Perfluoropentanesulfonic acid (PFPeS)	<0.66		6.88	7.03	J	ug/Kg	⊗	102	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	<1.0		6.67	7.37		ug/Kg	⊗	110	70 - 130
Perfluoroheptanesulfonic Acid (PFHpS)	<1.2		6.98	8.31		ug/Kg	⊗	119	70 - 130
Perfluoroctanesulfonic acid (PFOS)	19	F1	6.80	28.5	F1	ug/Kg	⊗	144	70 - 130

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-73382-7 MS

Client Sample ID: BIOSOLIDS-A-20210506

Matrix: Solid

Prep Type: Total/NA

Analysis Batch: 489473

Prep Batch: 488275

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec.	Limits
Perfluorononanesulfonic acid (PFNS)	<0.66		7.04	6.26	J	ug/Kg	⊗	89	70 - 130
Perfluorodecanesulfonic acid (PFDS)	4.6	J F1	7.07	11.3		ug/Kg	⊗	94	70 - 130
Perfluorododecanesulfonic acid (PFDoS)	<2.0		7.10	6.23	J I	ug/Kg	⊗	88	70 - 130
Perfluoroctanesulfonamide (FOSA)	<2.7	F1	7.33	12.4	F1	ug/Kg	⊗	169	70 - 130
NEtFOSA	<0.79	F1	7.33	8.83		ug/Kg	⊗	120	70 - 130
NMeFOSA	<1.4		7.33	7.32		ug/Kg	⊗	100	70 - 130
NMeFOSAA	41	J	7.33	44.1	J 4	ug/Kg	⊗	39	70 - 130
NETFOSAA	14	J F1	7.33	23.9	J F1	ug/Kg	⊗	138	70 - 130
NMeFOSE	9.9	F1	7.33	30.6	F1	ug/Kg	⊗	283	70 - 130
NETFOSE	<1.2	F1	7.33	11.3	F1	ug/Kg	⊗	155	70 - 130
4:2 FTS	<12		6.85	<14		ug/Kg	⊗	NC	70 - 130
6:2 FTS	<5.0	F1	6.95	9.29	J F1	ug/Kg	⊗	134	70 - 130
8:2 FTS	<8.3		7.02	11.9	J	ug/Kg	⊗	NC	70 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.60		6.91	6.76	J	ug/Kg	⊗	98	70 - 130
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<3.6	F1	7.33	9.66	F1	ug/Kg	⊗	132	70 - 130
F-53B Major	<0.89		6.83	7.27	J	ug/Kg	⊗	106	70 - 130
F-53B Minor	<0.73		6.91	6.35	J	ug/Kg	⊗	92	70 - 130
Isotope Dilution	MS %Recovery	MS Qualifier	MS Limits						
13C4 PFBA	73		25 - 150						
13C5 PFPeA	68		25 - 150						
13C2 PFHxA	69		25 - 150						
13C4 PFHpA	71		25 - 150						
13C4 PFOA	75		25 - 150						
13C5 PFNA	78		25 - 150						
13C2 PFDA	79		25 - 150						
13C2 PFUnA	83		25 - 150						
13C2 PFDoA	52		25 - 150						
13C2 PFTeDA	34		25 - 150						
13C3 PFBS	69		25 - 150						
18O2 PFHxS	77		25 - 150						
13C4 PFOS	73		25 - 150						
13C8 FOSA	60		10 - 150						
d3-NMeFOSAA	72		25 - 150						
d5-NEtFOSAA	76		25 - 150						
d-N-MeFOSA-M	44		10 - 150						
d-N-EtFOSA-M	26		10 - 150						
d7-N-MeFOSE-M	53		10 - 150						
d9-N-EtFOSE-M	42		10 - 150						
M2-4:2 FTS	113		25 - 150						
M2-6:2 FTS	139		25 - 150						
M2-8:2 FTS	155	*5+	25 - 150						
13C3 HFPO-DA	64		25 - 150						

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QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-73382-7 MSD

Matrix: Solid

Analysis Batch: 489473

Client Sample ID: BIOSOLIDS-A-20210506

Prep Type: Total/NA

Prep Batch: 488275

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits		
Perfluorobutanoic acid (PFBA)	3.4	J	7.22	12.1		ug/Kg	⊗	120	70 - 130	1	30
Perfluoropentanoic acid (PFPeA)	11	F1	7.22	20.4	F1	ug/Kg	⊗	132	70 - 130	4	30
Perfluorohexanoic acid (PFHxA)	29	F1	7.22	42.2	4	ug/Kg	⊗	180	70 - 130	19	30
Perfluoroheptanoic acid (PFHpA)	<0.96	F1	7.22	10.5	F1	ug/Kg	⊗	145	70 - 130	3	30
Perfluorooctanoic acid (PFOA)	16	F1	7.22	23.7		ug/Kg	⊗	108	70 - 130	21	30
Perfluorononanoic acid (PFNA)	1.3	J F1	7.22	9.41		ug/Kg	⊗	112	70 - 130	15	30
Perfluorodecanoic acid (PFDA)	15	F1	7.22	19.6	F1	ug/Kg	⊗	58	70 - 130	5	30
Perfluoroundecanoic acid (PFUnA)	<1.2	F1	7.22	12.0	F1	ug/Kg	⊗	166	70 - 130	22	30
Perfluorododecanoic acid (PFDa)	5.4	J	7.22	14.3		ug/Kg	⊗	124	70 - 130	6	30
Perfluorotridecanoic acid (PFTriA)	<1.7		7.22	5.79	J	ug/Kg	⊗	80	70 - 130	2	30
Perfluorotetradecanoic acid (PFTeA)	<1.8	F1	7.22	11.6	F1	ug/Kg	⊗	161	70 - 130	17	30
Perfluorobutanesulfonic acid (PFBS)	<0.83	F1	6.38	9.10	F1	ug/Kg	⊗	143	70 - 130	0	30
Perfluoropentanesulfonic acid (PFPeS)	<0.66		6.77	6.67	J	ug/Kg	⊗	98	70 - 130	5	30
Perfluorohexanesulfonic acid (PFHxS)	<1.0		6.57	7.02	J	ug/Kg	⊗	107	70 - 130	5	30
Perfluoroheptanesulfonic Acid (PFHpS)	<1.2		6.87	8.57		ug/Kg	⊗	125	70 - 130	3	30
Perfluorooctanesulfonic acid (PFOS)	19	F1	6.70	31.6	F1	ug/Kg	⊗	193	70 - 130	10	30
Perfluoronananesulfonic acid (PFNS)	<0.66		6.93	5.35	J	ug/Kg	⊗	77	70 - 130	16	30
Perfluorodecanesulfonic acid (PFDS)	4.6	J F1	6.96	14.9	F1	ug/Kg	⊗	148	70 - 130	27	30
Perfluorododecanesulfonic acid (PFDs)	<2.0		6.99	5.05	J	ug/Kg	⊗	72	70 - 130	21	30
Perfluoroctanesulfonamide (FOSA)	<2.7	F1	7.22	12.9	F1	ug/Kg	⊗	179	70 - 130	4	30
NEtFOSA	<0.79	F1	7.22	11.2	F1	ug/Kg	⊗	155	70 - 130	24	30
NMeFOSA	<1.4		7.22	8.99		ug/Kg	⊗	124	70 - 130	20	30
NMeFOSAA	41	J	7.22	50.8	J 4	ug/Kg	⊗	132	70 - 130	14	30
NEtFOSAA	14	J F1	7.22	28.5	J F1	ug/Kg	⊗	204	70 - 130	18	30
NMeFOSE	9.9	F1	7.22	33.1	F1	ug/Kg	⊗	322	70 - 130	8	30
NEtFOSE	<1.2	F1	7.22	8.61		ug/Kg	⊗	119	70 - 130	27	30
4:2 FTS	<12		6.74	<13		ug/Kg	⊗	NC	70 - 130	NC	30
6:2 FTS	<5.0	F1	6.84	8.56	J	ug/Kg	⊗	125	70 - 130	8	30
8:2 FTS	<8.3		6.92	10.6	J	ug/Kg	⊗	NC	70 - 130	11	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.60		6.80	6.67	J	ug/Kg	⊗	98	70 - 130	1	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<3.6	F1	7.22	8.82	J	ug/Kg	⊗	122	70 - 130	9	30
F-53B Major	<0.89		6.73	7.53		ug/Kg	⊗	112	70 - 130	4	30
F-53B Minor	<0.73		6.80	7.12	J	ug/Kg	⊗	105	70 - 130	11	30
Isotope Dilution		MSD	MSD								
Isotope Dilution		%Recovery	Qualifier	Limits							
13C4 PFBA		79		25 - 150							
13C5 PFPeA		66		25 - 150							

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-73382-7 MSD

Client Sample ID: BIOSOLIDS-A-20210506

Matrix: Solid

Prep Type: Total/NA

Analysis Batch: 489473

Prep Batch: 488275

<i>Isotope Dilution</i>	<i>MSD</i>	<i>MSD</i>	<i>Qualifier</i>	<i>Limits</i>
	<i>%Recovery</i>			
13C2 PFHxA	74			25 - 150
13C4 PFHpA	65			25 - 150
13C4 PFOA	75			25 - 150
13C5 PFNA	83			25 - 150
13C2 PFDA	73			25 - 150
13C2 PFUnA	73			25 - 150
13C2 PFDoA	46			25 - 150
13C2 PFTeDA	29			25 - 150
13C3 PFBS	71			25 - 150
18O2 PFHxS	75			25 - 150
13C4 PFOS	68			25 - 150
13C8 FOSA	62			10 - 150
d3-NMeFOSAA	67			25 - 150
d5-NEtFOSAA	53			25 - 150
d-N-MeFOSA-M	48			10 - 150
d-N-EtFOSA-M	26			10 - 150
d7-N-MeFOSE-M	40			10 - 150
d9-N-EtFOSE-M	50			10 - 150
M2-4:2 FTS	99			25 - 150
M2-6:2 FTS	131			25 - 150
M2-8:2 FTS	159 *5+			25 - 150
13C3 HFPO-DA	66			25 - 150

Lab Sample ID: MB 320-488328/1-A

Client Sample ID: Method Blank

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 488566

Prep Batch: 488328

<i>Analyte</i>	<i>MB</i>	<i>MB</i>	<i>Result</i>	<i>Qualifier</i>	<i>RL</i>	<i>MDL</i>	<i>Unit</i>	<i>D</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Perfluorobutanoic acid (PFBA)	<2.4				5.0	2.4	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluoropentanoic acid (PFPeA)	<0.49				2.0	0.49	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluorohexanoic acid (PFHxA)	<0.58				2.0	0.58	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluoroheptanoic acid (PFHpA)	<0.25				2.0	0.25	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluorooctanoic acid (PFOA)	<0.85				2.0	0.85	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluorononanoic acid (PFNA)	<0.27				2.0	0.27	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluorodecanoic acid (PFDA)	<0.31				2.0	0.31	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluoroundecanoic acid (PFUnA)	<1.1				2.0	1.1	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluorododecanoic acid (PFDoA)	<0.55				2.0	0.55	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluorotridecanoic acid (PFTriA)	<1.3				2.0	1.3	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluorotetradecanoic acid (PFTeA)	<0.73				2.0	0.73	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluorobutanesulfonic acid (PFBS)	<0.20				2.0	0.20	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluoropentanesulfonic acid (PFPeS)	<0.30				2.0	0.30	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluorohexanesulfonic acid (PFHxS)	<0.57				2.0	0.57	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.19				2.0	0.19	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluorooctanesulfonic acid (PFOS)	<0.54				2.0	0.54	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluoronananesulfonic acid (PFNS)	<0.37				2.0	0.37	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluorodecanesulfonic acid (PFDS)	<0.32				2.0	0.32	ng/L		05/12/21 12:16	05/13/21 06:12	1
Perfluorododecanesulfonic acid (PFDoS)	<0.97				2.0	0.97	ng/L		05/12/21 12:16	05/13/21 06:12	1

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QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-488328/1-A

Matrix: Water

Analysis Batch: 488566

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 488328

Analyte	MB	MB	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result									
Perfluorooctanesulfonamide (FOSA)	<0.98			2.0	0.98	ng/L		05/12/21 12:16	05/13/21 06:12	1
NEtFOSA	<0.87			2.0	0.87	ng/L		05/12/21 12:16	05/13/21 06:12	1
NMeFOSA	<0.43			2.0	0.43	ng/L		05/12/21 12:16	05/13/21 06:12	1
NMeFOSAA	<1.2			5.0	1.2	ng/L		05/12/21 12:16	05/13/21 06:12	1
NEtFOSAA	<1.3			5.0	1.3	ng/L		05/12/21 12:16	05/13/21 06:12	1
NMeFOSE	<1.4			4.0	1.4	ng/L		05/12/21 12:16	05/13/21 06:12	1
NEtFOSE	<0.85			2.0	0.85	ng/L		05/12/21 12:16	05/13/21 06:12	1
4:2 FTS	<0.24			2.0	0.24	ng/L		05/12/21 12:16	05/13/21 06:12	1
6:2 FTS	<2.5			5.0	2.5	ng/L		05/12/21 12:16	05/13/21 06:12	1
8:2 FTS	<0.46			2.0	0.46	ng/L		05/12/21 12:16	05/13/21 06:12	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.40			2.0	0.40	ng/L		05/12/21 12:16	05/13/21 06:12	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1.5			4.0	1.5	ng/L		05/12/21 12:16	05/13/21 06:12	1
F-53B Major	<0.24			2.0	0.24	ng/L		05/12/21 12:16	05/13/21 06:12	1
F-53B Minor	<0.32			2.0	0.32	ng/L		05/12/21 12:16	05/13/21 06:12	1

Isotope Dilution	MB	MB	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac	
13C4 PFBA		80			25 - 150		05/12/21 12:16	05/13/21 06:12	1
13C5 PFPeA		82			25 - 150		05/12/21 12:16	05/13/21 06:12	1
13C2 PFHxA		95			25 - 150		05/12/21 12:16	05/13/21 06:12	1
13C4 PFHpA		84			25 - 150		05/12/21 12:16	05/13/21 06:12	1
13C4 PFOA		86			25 - 150		05/12/21 12:16	05/13/21 06:12	1
13C5 PFNA		85			25 - 150		05/12/21 12:16	05/13/21 06:12	1
13C2 PFDA		88			25 - 150		05/12/21 12:16	05/13/21 06:12	1
13C2 PFUnA		94			25 - 150		05/12/21 12:16	05/13/21 06:12	1
13C2 PFDoA		84			25 - 150		05/12/21 12:16	05/13/21 06:12	1
13C2 PFTeDA		83			25 - 150		05/12/21 12:16	05/13/21 06:12	1
13C3 PFBS		69			25 - 150		05/12/21 12:16	05/13/21 06:12	1
18O2 PFHxS		76			25 - 150		05/12/21 12:16	05/13/21 06:12	1
13C4 PFOS		78			25 - 150		05/12/21 12:16	05/13/21 06:12	1
13C8 FOSA		80			10 - 150		05/12/21 12:16	05/13/21 06:12	1
d3-NMeFOSAA		107			25 - 150		05/12/21 12:16	05/13/21 06:12	1
d5-NEtFOSAA		94			25 - 150		05/12/21 12:16	05/13/21 06:12	1
d-N-MeFOSA-M		59			10 - 150		05/12/21 12:16	05/13/21 06:12	1
d-N-EtFOSA-M		61			10 - 150		05/12/21 12:16	05/13/21 06:12	1
d7-N-MeFOSE-M		83			10 - 150		05/12/21 12:16	05/13/21 06:12	1
d9-N-EtFOSE-M		83			10 - 150		05/12/21 12:16	05/13/21 06:12	1
M2-4:2 FTS		72			25 - 150		05/12/21 12:16	05/13/21 06:12	1
M2-6:2 FTS		87			25 - 150		05/12/21 12:16	05/13/21 06:12	1
M2-8:2 FTS		110			25 - 150		05/12/21 12:16	05/13/21 06:12	1
13C3 HFPO-DA		81			25 - 150		05/12/21 12:16	05/13/21 06:12	1

Lab Sample ID: LCS 320-488328/2-A

Matrix: Water

Analysis Batch: 488566

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 488328

Analyte	Spike	LCS	LCS	%Rec.			
	Added	Result	Qualifier	Unit	D	%Rec.	Limits
Perfluorobutanoic acid (PFBA)	40.0	42.9		ng/L	107	60 - 135	

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-488328/2-A

Matrix: Water

Analysis Batch: 488566

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 488328

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluoropentanoic acid (PFPeA)	40.0	44.0		ng/L	110	60 - 135	
Perfluorohexanoic acid (PFHxA)	40.0	40.0		ng/L	100	60 - 135	
Perfluoroheptanoic acid (PFHpA)	40.0	44.0		ng/L	110	60 - 135	
Perfluorooctanoic acid (PFOA)	40.0	42.5		ng/L	106	60 - 135	
Perfluorononanoic acid (PFNA)	40.0	43.2		ng/L	108	60 - 135	
Perfluorodecanoic acid (PFDA)	40.0	42.3		ng/L	106	60 - 135	
Perfluoroundecanoic acid (PFUnA)	40.0	45.0		ng/L	112	60 - 135	
Perfluorododecanoic acid (PFDa)	40.0	43.3		ng/L	108	60 - 135	
Perfluorotridecanoic acid (PFTriA)	40.0	40.0		ng/L	100	60 - 135	
Perfluorotetradecanoic acid (PFTeA)	40.0	46.0		ng/L	115	60 - 135	
Perfluorobutanesulfonic acid (PFBS)	35.4	35.7		ng/L	101	60 - 135	
Perfluoropentanesulfonic acid (PFPeS)	37.5	47.0		ng/L	125	60 - 135	
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.7		ng/L	98	60 - 135	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	41.3		ng/L	108	60 - 135	
Perfluorooctanesulfonic acid (PFOS)	37.1	37.0		ng/L	100	60 - 135	
Perfluorononanesulfonic acid (PFNS)	38.4	41.6		ng/L	108	60 - 135	
Perfluorodecanesulfonic acid (PFDS)	38.6	36.9		ng/L	96	60 - 135	
Perfluorododecanesulfonic acid (PFDaS)	38.7	36.7		ng/L	95	60 - 135	
Perfluoroctanesulfonamide (FOSA)	40.0	46.2		ng/L	115	60 - 135	
NEtFOSA	40.0	41.1		ng/L	103	60 - 135	
NMeFOSA	40.0	47.1		ng/L	118	60 - 135	
NMeFOSAA	40.0	39.7		ng/L	99	60 - 135	
NEtFOSAA	40.0	44.2		ng/L	110	60 - 135	
NMeFOSE	40.0	44.4		ng/L	111	60 - 135	
NEtFOSE	40.0	42.7		ng/L	107	60 - 135	
4:2 FTS	37.4	42.6		ng/L	114	60 - 135	
6:2 FTS	37.9	44.0		ng/L	116	60 - 135	
8:2 FTS	38.3	40.3		ng/L	105	60 - 135	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.7	40.3		ng/L	107	60 - 135	
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	40.0	43.4		ng/L	108	60 - 135	
F-53B Major	37.3	43.6		ng/L	117	60 - 135	
F-53B Minor	37.7	41.1		ng/L	109	60 - 135	

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFBA	76		25 - 150
13C5 PFPeA	74		25 - 150
13C2 PFHxA	90		25 - 150

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-488328/2-A

Matrix: Water

Analysis Batch: 488566

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 488328

<i>Isotope Dilution</i>	<i>LCS</i>	<i>LCS</i>	<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
13C4 PFHpA	82		25 - 150
13C4 PFOA	82		25 - 150
13C5 PFNA	81		25 - 150
13C2 PFDA	80		25 - 150
13C2 PFUnA	82		25 - 150
13C2 PFDoA	79		25 - 150
13C2 PFTeDA	76		25 - 150
13C3 PFBS	72		25 - 150
18O2 PFHxS	74		25 - 150
13C4 PFOS	75		25 - 150
13C8 FOSA	76		10 - 150
d3-NMeFOSAA	98		25 - 150
d5-NEtFOSAA	91		25 - 150
d-N-MeFOSA-M	52		10 - 150
d-N-EtFOSA-M	54		10 - 150
d7-N-MeFOSE-M	75		10 - 150
d9-N-EtFOSE-M	72		10 - 150
M2-4:2 FTS	66		25 - 150
M2-6:2 FTS	78		25 - 150
M2-8:2 FTS	97		25 - 150
13C3 HFPO-DA	76		25 - 150

Lab Sample ID: LCSD 320-488328/3-A

Matrix: Water

Analysis Batch: 488566

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 488328

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	40.0	40.7		ng/L		102	60 - 135	5	30
Perfluoropentanoic acid (PPPeA)	40.0	39.2		ng/L		98	60 - 135	12	30
Perfluorohexanoic acid (PFHxA)	40.0	40.8		ng/L		102	60 - 135	2	30
Perfluoroheptanoic acid (PFHpA)	40.0	44.3		ng/L		111	60 - 135	1	30
Perfluorooctanoic acid (PFOA)	40.0	43.0		ng/L		107	60 - 135	1	30
Perfluorononanoic acid (PFNA)	40.0	44.6		ng/L		111	60 - 135	3	30
Perfluorodecanoic acid (PFDA)	40.0	39.5		ng/L		99	60 - 135	7	30
Perfluoroundecanoic acid (PFUnA)	40.0	40.2		ng/L		100	60 - 135	11	30
Perfluorododecanoic acid (PFDoA)	40.0	40.1		ng/L		100	60 - 135	8	30
Perfluorotridecanoic acid (PTriA)	40.0	39.1		ng/L		98	60 - 135	2	30
Perfluorotetradecanoic acid (PFTeA)	40.0	42.0		ng/L		105	60 - 135	9	30
Perfluorobutanesulfonic acid (PFBS)	35.4	36.9		ng/L		104	60 - 135	3	30
Perfluoropentanesulfonic acid (PPPeS)	37.5	46.3		ng/L		123	60 - 135	1	30
Perfluorohexamenesulfonic acid (PFHxS)	36.4	37.0		ng/L		102	60 - 135	4	30
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	42.1		ng/L		110	60 - 135	2	30

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-488328/3-A

Client Sample ID: Lab Control Sample Dup

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 488566

Prep Batch: 488328

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec.	RPD
				ng/L	108	Limits	Limit
Perfluorooctanesulfonic acid (PFOS)	37.1	40.2				60 - 135	8
Perfluorononanesulfonic acid (PFNS)	38.4	37.1		ng/L		97	30
Perfluorodecanesulfonic acid (PFDS)	38.6	37.4		ng/L		97	30
Perfluorododecanesulfonic acid (PFDoS)	38.7	37.6		ng/L		97	30
Perfluorooctanesulfonamide (FOSA)	40.0	42.9		ng/L		107	30
NEtFOSA	40.0	44.1		ng/L		110	30
NMeFOSA	40.0	44.4		ng/L		111	30
NMeFOSAA	40.0	41.4		ng/L		104	30
NEtFOSAA	40.0	45.0		ng/L		112	30
NMeFOSE	40.0	44.1		ng/L		110	30
NEtFOSE	40.0	43.5		ng/L		109	30
4:2 FTS	37.4	40.1		ng/L		107	30
6:2 FTS	37.9	41.5		ng/L		109	30
8:2 FTS	38.3	43.1		ng/L		112	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.7	40.6		ng/L		108	30
Hexafluoropropylene Oxide	40.0	41.3		ng/L		103	30
Dimer Acid (HFPO-DA)							
F-53B Major	37.3	43.0		ng/L		115	30
F-53B Minor	37.7	39.6		ng/L		105	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C4 PFBA	75		25 - 150
13C5 PFPeA	71		25 - 150
13C2 PFHxA	82		25 - 150
13C4 PFHpA	76		25 - 150
13C4 PFOA	75		25 - 150
13C5 PFNA	76		25 - 150
13C2 PFDA	79		25 - 150
13C2 PFUnA	83		25 - 150
13C2 PFDoA	75		25 - 150
13C2 PFTeDA	74		25 - 150
13C3 PFBS	66		25 - 150
18O2 PFHxS	72		25 - 150
13C4 PFOS	70		25 - 150
13C8 FOSA	72		10 - 150
d3-NMeFOSAA	88		25 - 150
d5-NEtFOSAA	89		25 - 150
d-N-MeFOSA-M	53		10 - 150
d-N-EtFOSA-M	50		10 - 150
d7-N-MeFOSE-M	73		10 - 150
d9-N-EtFOSE-M	70		10 - 150
M2-4:2 FTS	61		25 - 150
M2-6:2 FTS	76		25 - 150
M2-8:2 FTS	89		25 - 150

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-488328/3-A

Matrix: Water

Analysis Batch: 488566

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 488328

<i>Isotope Dilution</i>	<i>LCSD</i>	<i>LCSD</i>	<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
13C3 HFPO-DA	71		25 - 150

Lab Sample ID: MB 320-490187/1-A

Matrix: Liquid

Analysis Batch: 491179

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 490187

Analyte	MB	MB	Dil Fac	
	Result	Qualifier		
Perfluorobutanoic acid (PFBA)	<0.070	0.50	0.070 ug/Kg	1
Perfluoropentanoic acid (PFPeA)	<0.19	0.50	0.19 ug/Kg	1
Perfluorohexanoic acid (PFHxA)	<0.11	0.50	0.11 ug/Kg	1
Perfluoroheptanoic acid (PFHpA)	<0.073	0.50	0.073 ug/Kg	1
Perfluorooctanoic acid (PFOA)	<0.22	0.50	0.22 ug/Kg	1
Perfluorononanoic acid (PFNA)	<0.090	0.50	0.090 ug/Kg	1
Perfluorodecanoic acid (PFDA)	<0.055	0.50	0.055 ug/Kg	1
Perfluoroundecanoic acid (PFUnA)	<0.090	0.50	0.090 ug/Kg	1
Perfluorododecanoic acid (PFDaO)	<0.17	0.50	0.17 ug/Kg	1
Perfluorotridecanoic acid (PFTrDA)	<0.13	0.50	0.13 ug/Kg	1
Perfluorotetradecanoic acid (PFTeA)	<0.14	0.50	0.14 ug/Kg	1
Perfluorobutanesulfonic acid (PFBS)	<0.063	0.50	0.063 ug/Kg	1
Perfluoropentanesulfonic acid (PPPeS)	<0.050	0.50	0.050 ug/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	<0.078	0.50	0.078 ug/Kg	1
Perfluoroheptanesulfonic Acid (PFHxS)	<0.088	0.50	0.088 ug/Kg	1
Perfluorooctanesulfonic acid (PFOS)	<0.50	1.3	0.50 ug/Kg	1
Perfluorononanesulfonic acid (PFNS)	<0.050	0.50	0.050 ug/Kg	1
Perfluorodecanesulfonic acid (PFDS)	<0.098	0.50	0.098 ug/Kg	1
Perfluorododecanesulfonic acid (PFDaS)	<0.15	0.50	0.15 ug/Kg	1
Perfluorooctanesulfonamide (FOSA)	<0.21	0.50	0.21 ug/Kg	1
NEtFOSA	<0.060	0.50	0.060 ug/Kg	1
NMeFOSA	<0.10	0.50	0.10 ug/Kg	1
NMeFOSAA	<0.98	5.0	0.98 ug/Kg	1
NEtFOSAA	<0.93	5.0	0.93 ug/Kg	1
NMeFOSE	<0.18	0.50	0.18 ug/Kg	1
NEtFOSE	<0.090	0.50	0.090 ug/Kg	1
4:2 FTS	<0.93	5.0	0.93 ug/Kg	1
6:2 FTS	<0.38	5.0	0.38 ug/Kg	1
8:2 FTS	<0.63	5.0	0.63 ug/Kg	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.045	0.50	0.045 ug/Kg	1
HFPO-DA (GenX)	<0.28	0.63	0.28 ug/Kg	1
9Cl-PF3ONS	<0.068	0.50	0.068 ug/Kg	1
11Cl-PF3OUds	<0.055	0.50	0.055 ug/Kg	1

Isotope Dilution	MB	MB	Dil Fac
	%Recovery	Qualifier	
13C4 PFBA	84	25 - 150	1
13C5 PFPeA	89	25 - 150	1
13C2 PFHxA	93	25 - 150	1
13C4 PFHpA	96	25 - 150	1

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-490187/1-A

Matrix: Liquid

Analysis Batch: 491179

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 490187

<i>Isotope Dilution</i>	<i>MB %Recovery</i>	<i>MB Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C4 PFOA	91		25 - 150	05/18/21 13:00	05/20/21 22:33	1
13C5 PFNA	86		25 - 150	05/18/21 13:00	05/20/21 22:33	1
13C2 PFDA	93		25 - 150	05/18/21 13:00	05/20/21 22:33	1
13C2 PFUnA	88		25 - 150	05/18/21 13:00	05/20/21 22:33	1
13C2 PFDoA	85		25 - 150	05/18/21 13:00	05/20/21 22:33	1
13C2 PFTeDA	74		25 - 150	05/18/21 13:00	05/20/21 22:33	1
13C3 PFBS	84		25 - 150	05/18/21 13:00	05/20/21 22:33	1
18O2 PFHxS	87		25 - 150	05/18/21 13:00	05/20/21 22:33	1
13C4 PFOS	78		25 - 150	05/18/21 13:00	05/20/21 22:33	1
13C8 FOSA	85		25 - 150	05/18/21 13:00	05/20/21 22:33	1
d3-NMeFOSAA	95		25 - 150	05/18/21 13:00	05/20/21 22:33	1
d5-NEtFOSAA	77		25 - 150	05/18/21 13:00	05/20/21 22:33	1
d-N-MeFOSA-M	67		25 - 150	05/18/21 13:00	05/20/21 22:33	1
d-N-EtFOSA-M	67		25 - 150	05/18/21 13:00	05/20/21 22:33	1
d7-N-MeFOSE-M	86		25 - 150	05/18/21 13:00	05/20/21 22:33	1
d9-N-EtFOSE-M	70		25 - 150	05/18/21 13:00	05/20/21 22:33	1
13C2 10:2 FTS	86			05/18/21 13:00	05/20/21 22:33	1
M2-4:2 FTS	92		25 - 150	05/18/21 13:00	05/20/21 22:33	1
M2-6:2 FTS	131		25 - 150	05/18/21 13:00	05/20/21 22:33	1
M2-8:2 FTS	113		25 - 150	05/18/21 13:00	05/20/21 22:33	1
13C3 HFPO-DA	78		25 - 150	05/18/21 13:00	05/20/21 22:33	1

Lab Sample ID: LCS 320-490187/2-A

Matrix: Liquid

Analysis Batch: 491179

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 490187

<i>Analyte</i>	<i>Spike Added</i>	<i>LCS Result</i>	<i>LCS Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec.</i>	<i>Limits</i>
Perfluorobutanoic acid (PFBA)	5.00	4.87		ug/Kg		97	81 - 133	
Perfluoropentanoic acid (PFPeA)	5.00	5.26		ug/Kg		105	79 - 120	
Perfluorohexanoic acid (PFHxA)	5.00	4.97		ug/Kg		99	75 - 125	
Perfluoroheptanoic acid (PFHpA)	5.00	5.88		ug/Kg		118	76 - 124	
Perfluorooctanoic acid (PFOA)	5.00	5.20		ug/Kg		104	76 - 121	
Perfluorononanoic acid (PFNA)	5.00	5.46		ug/Kg		109	74 - 126	
Perfluorodecanoic acid (PFDA)	5.00	5.12		ug/Kg		102	74 - 124	
Perfluoroundecanoic acid (PFUnA)	5.00	4.60		ug/Kg		92	74 - 114	
Perfluorododecanoic acid (PFDoA)	5.00	5.74		ug/Kg		115	75 - 123	
Perfluorotridecanoic acid (PFTrDA)	5.00	4.64		ug/Kg		93	43 - 116	
Perfluorotetradecanoic acid (PFTeA)	5.00	6.04		ug/Kg		121	22 - 129	
Perfluorobutanesulfonic acid (PFBS)	4.42	4.69		ug/Kg		106	73 - 142	
Perfluoropentanesulfonic acid (PFPeS)	4.69	4.44		ug/Kg		95	70 - 130	
Perfluorohexanesulfonic acid (PFHxS)	4.55	4.86		ug/Kg		107	75 - 121	
Perfluoroheptanesulfonic Acid (PFHpS)	4.76	5.08		ug/Kg		107	78 - 146	

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-490187/2-A

Matrix: Liquid

Analysis Batch: 491179

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 490187

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorooctanesulfonic acid (PFOS)	4.64	4.78		ug/Kg	103	69 - 131	
Perfluorononanesulfonic acid (PFNS)	4.80	4.87		ug/Kg	101	70 - 130	
Perfluorodecanesulfonic acid (PFDS)	4.82	4.16		ug/Kg	86	54 - 113	
Perfluorododecanesulfonic acid (PFDoS)	4.84	4.43		ug/Kg	92	70 - 130	
Perfluorooctanesulfonamide (FOSA)	5.00	5.43		ug/Kg	109	62 - 135	
NEtFOSA	5.00	5.51		ug/Kg	110	65 - 135	
NMeFOSA	5.00	4.87		ug/Kg	97	60 - 140	
NMeFOSAA	5.00	5.14		ug/Kg	103	65 - 135	
NEtFOSAA	5.00	5.44		ug/Kg	109	65 - 135	
NMeFOSE	5.00	4.70		ug/Kg	94	65 - 135	
NEtFOSE	5.00	4.73		ug/Kg	95	65 - 135	
4:2 FTS	4.67	5.33		ug/Kg	114	50 - 150	
6:2 FTS	4.74	5.21		ug/Kg	110	65 - 135	
8:2 FTS	4.79	5.14		ug/Kg	107	65 - 135	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	4.71	5.97		ug/Kg	127	70 - 130	
HFPO-DA (GenX)	5.00	5.14		ug/Kg	103	70 - 130	
9Cl-PF3ONS	4.66	4.80		ug/Kg	103	70 - 130	
11Cl-PF3OUds	4.71	4.81		ug/Kg	102	70 - 130	

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFBA	93		25 - 150
13C5 PFPeA	82		25 - 150
13C2 PFHxA	85		25 - 150
13C4 PFHpA	93		25 - 150
13C4 PFOA	90		25 - 150
13C5 PFNA	87		25 - 150
13C2 PFDA	88		25 - 150
13C2 PFUnA	93		25 - 150
13C2 PFDoA	83		25 - 150
13C2 PFTeDA	72		25 - 150
13C3 PFBS	87		25 - 150
18O2 PFHxS	86		25 - 150
13C4 PFOS	76		25 - 150
13C8 FOSA	81		25 - 150
d3-NMeFOSAA	87		25 - 150
d5-NEtFOSAA	82		25 - 150
d-N-MeFOSA-M	73		25 - 150
d-N-EtFOSA-M	73		25 - 150
d7-N-MeFOSE-M	93		25 - 150
d9-N-EtFOSE-M	91		25 - 150
13C2 10:2 FTS	83		
M2-4:2 FTS	76		25 - 150
M2-6:2 FTS	108		25 - 150
M2-8:2 FTS	106		25 - 150

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-490187/2-A

Matrix: Liquid

Analysis Batch: 491179

<i>Isotope Dilution</i>	<i>LCS</i>	<i>LCS</i>	<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
13C3 HFPO-DA	80		25 - 150

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 490187

Lab Sample ID: LCSD 320-490187/3-A

Matrix: Liquid

Analysis Batch: 491179

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Perfluorobutanoic acid (PFBA)	5.00	5.00		ug/Kg		100	81 - 133	3	30
Perfluoropentanoic acid (PFPeA)	5.00	5.70		ug/Kg		114	79 - 120	8	30
Perfluorohexanoic acid (PFhxA)	5.00	5.00		ug/Kg		100	75 - 125	1	30
Perfluoroheptanoic acid (PFHpA)	5.00	5.41		ug/Kg		108	76 - 124	8	30
Perfluorooctanoic acid (PFOA)	5.00	5.09		ug/Kg		102	76 - 121	2	30
Perfluorononanoic acid (PFNA)	5.00	4.96		ug/Kg		99	74 - 126	10	30
Perfluorodecanoic acid (PFDA)	5.00	5.50		ug/Kg		110	74 - 124	7	30
Perfluoroundecanoic acid (PFUnA)	5.00	4.73		ug/Kg		95	74 - 114	3	30
Perfluorododecanoic acid (PFDa)	5.00	5.89		ug/Kg		118	75 - 123	3	30
Perfluorotridecanoic acid (PFTrDA)	5.00	5.47		ug/Kg		109	43 - 116	17	30
Perfluorotetradecanoic acid (PFTeA)	5.00	5.43		ug/Kg		109	22 - 129	11	30
Perfluorobutanesulfonic acid (PFBS)	4.42	4.52		ug/Kg		102	73 - 142	4	30
Perfluoropentanesulfonic acid (PFPeS)	4.69	4.49		ug/Kg		96	70 - 130	1	30
Perfluorohexanesulfonic acid (PFHxS)	4.55	4.20		ug/Kg		92	75 - 121	15	30
Perfluoroheptanesulfonic Acid (PFHpS)	4.76	5.09		ug/Kg		107	78 - 146	0	30
Perfluorooctanesulfonic acid (PFOS)	4.64	4.44		ug/Kg		96	69 - 131	7	30
Perfluorononanesulfonic acid (PFNS)	4.80	4.26		ug/Kg		89	70 - 130	13	30
Perfluorodecanesulfonic acid (PFDS)	4.82	4.32		ug/Kg		90	54 - 113	4	30
Perfluorododecanesulfonic acid (PFDaS)	4.84	4.66		ug/Kg		96	70 - 130	5	30
Perfluorooctanesulfonamide (FOSA)	5.00	5.58		ug/Kg		112	62 - 135	3	30
NEtFOSA	5.00	5.39		ug/Kg		108	65 - 135	2	30
NMeFOSA	5.00	5.06		ug/Kg		101	60 - 140	4	30
NMeFOSAA	5.00	5.25		ug/Kg		105	65 - 135	2	30
NEtFOSAA	5.00	5.45		ug/Kg		109	65 - 135	0	30
NMeFOSE	5.00	5.03		ug/Kg		101	65 - 135	7	30
NEtFOSE	5.00	4.73		ug/Kg		95	65 - 135	0	30
4:2 FTS	4.67	5.25		ug/Kg		112	50 - 150	2	30
6:2 FTS	4.74	5.06		ug/Kg		107	65 - 135	3	30
8:2 FTS	4.79	5.21		ug/Kg		109	65 - 135	1	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	4.71	5.29		ug/Kg		112	70 - 130	12	30
HFPO-DA (GenX)	5.00	5.31		ug/Kg		106	70 - 130	3	30

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-490187/3-A

Matrix: Liquid

Analysis Batch: 491179

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 490187

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD RPD	RPD Limit
9Cl-PF3ONS	4.66	4.50		ug/Kg		96	70 - 130	6	30
11Cl-PF3OUDs	4.71	4.52		ug/Kg		96	70 - 130	6	30
Isotope Dilution	%Recovery	LCSD Qualifier	LCSD Limits						
13C4 PFBA	82		25 - 150						
13C5 PFPeA	83		25 - 150						
13C2 PFHxA	87		25 - 150						
13C4 PFHpA	94		25 - 150						
13C4 PFOA	96		25 - 150						
13C5 PFNA	96		25 - 150						
13C2 PFDA	81		25 - 150						
13C2 PFUnA	90		25 - 150						
13C2 PFDaA	79		25 - 150						
13C2 PFTeDA	74		25 - 150						
13C3 PFBS	79		25 - 150						
18O2 PFHxS	90		25 - 150						
13C4 PFOS	81		25 - 150						
13C8 FOSA	78		25 - 150						
d3-NMeFOSAA	87		25 - 150						
d5-NEtFOSAA	82		25 - 150						
d-N-MeFOSA-M	69		25 - 150						
d-N-EtFOSA-M	73		25 - 150						
d7-N-MeFOSE-M	94		25 - 150						
d9-N-EtFOSE-M	84		25 - 150						
13C2 10:2 FTS	77								
M2-4:2 FTS	77		25 - 150						
M2-6:2 FTS	117		25 - 150						
M2-8:2 FTS	100		25 - 150						
13C3 HFPO-DA	83		25 - 150						

Lab Sample ID: MB 320-492151/1-A

Matrix: Liquid

Analysis Batch: 492614

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 492151

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.070		0.50	0.070	ug/Kg		05/24/21 13:33	05/25/21 23:29	1
Perfluorododecanoic acid (PFDaA)	<0.17		0.50	0.17	ug/Kg		05/24/21 13:33	05/25/21 23:29	1
Perfluorotridecanoic acid (PFTrDA)	<0.13		0.50	0.13	ug/Kg		05/24/21 13:33	05/25/21 23:29	1
NEtFOSA	<0.060		0.50	0.060	ug/Kg		05/24/21 13:33	05/25/21 23:29	1
NMeFOSA	<0.10		0.50	0.10	ug/Kg		05/24/21 13:33	05/25/21 23:29	1
NEtFOSE	<0.090		0.50	0.090	ug/Kg		05/24/21 13:33	05/25/21 23:29	1
Isotope Dilution	%Recovery	MB Qualifier	MB Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	97		25 - 150				05/24/21 13:33	05/25/21 23:29	1
13C2 PFDaA	83		25 - 150				05/24/21 13:33	05/25/21 23:29	1
d-N-MeFOSA-M	60		25 - 150				05/24/21 13:33	05/25/21 23:29	1
d-N-EtFOSA-M	56		25 - 150				05/24/21 13:33	05/25/21 23:29	1
d9-N-EtFOSE-M	66		25 - 150				05/24/21 13:33	05/25/21 23:29	1

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-492151/2-A

Matrix: Liquid

Analysis Batch: 492614

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 492151

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.
							Limits
Perfluorobutanoic acid (PFBA)	5.00	5.21		ug/Kg		104	81 - 133
Perfluorododecanoic acid (PFDa)	5.00	5.49		ug/Kg		110	75 - 123
Perfluorotridecanoic acid (PFTrDA)	5.00	5.55		ug/Kg		111	43 - 116
NEtFOSA	5.00	5.48		ug/Kg		110	65 - 135
NMeFOSA	5.00	4.98		ug/Kg		100	60 - 140
NEtFOSE	5.00	5.77		ug/Kg		115	65 - 135
Isotope Dilution	LCS %Recovery	LCS Qualifier	LCS Limits				
13C4 PFBA	93		25 - 150				
13C2 PFDa	90		25 - 150				
d-N-MeFOSA-M	85		25 - 150				
d-N-EtFOSA-M	73		25 - 150				
d9-N-EtFOSE-M	70		25 - 150				

Lab Sample ID: LCSD 320-492151/3-A

Matrix: Liquid

Analysis Batch: 492614

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 492151

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	RPD
						Limits	RPD Limit
Perfluorobutanoic acid (PFBA)	5.00	5.17		ug/Kg		103	81 - 133
Perfluorododecanoic acid (PFDa)	5.00	5.28		ug/Kg		106	75 - 123
Perfluorotridecanoic acid (PFTrDA)	5.00	5.19		ug/Kg		104	43 - 116
NEtFOSA	5.00	5.40		ug/Kg		108	65 - 135
NMeFOSA	5.00	5.10		ug/Kg		102	60 - 140
NEtFOSE	5.00	5.61		ug/Kg		112	65 - 135
Isotope Dilution	LCSD %Recovery	LCSD Qualifier	LCSD Limits				
13C4 PFBA	89		25 - 150				
13C2 PFDa	69		25 - 150				
d-N-MeFOSA-M	81		25 - 150				
d-N-EtFOSA-M	68		25 - 150				
d9-N-EtFOSE-M	52		25 - 150				

Method: SM 2540B - Solids, Total

Lab Sample ID: MB 500-598489/1

Matrix: Water

Analysis Batch: 598489

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	ND			4.5	mg/L				
Total Solids	ND		10	4.5	mg/L			05/13/21 03:21	1

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method: SM 2540B - Solids, Total (Continued)

Lab Sample ID: LCS 500-598489/2

Matrix: Water

Analysis Batch: 598489

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits
Total Solids	250	242		mg/L	97	80 - 120		

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-598401/1

Matrix: Water

Analysis Batch: 598401

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.9	mg/L			05/12/21 16:05	1

Lab Sample ID: LCS 500-598401/2

Matrix: Water

Analysis Batch: 598401

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits
Total Suspended Solids	200	187		mg/L	93	80 - 120		

QC Association Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

LCMS

Prep Batch: 487831

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-1	INFLUENT-02-20210506	Total/NA	Water	3535	
320-73382-2	INFLUENT-07-20210506	Total/NA	Water	3535	
320-73382-3	INFLUENT-08-20210506	Total/NA	Water	3535	
320-73382-4	INFLUENT-11-20210506	Total/NA	Water	3535	
320-73382-5	INFLUENT-18-20210506	Total/NA	Water	3535	
320-73382-6	EFFLUENT-PERM-20210506	Total/NA	Water	3535	
MB 320-487831/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-487831/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-487831/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 488134

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-5	INFLUENT-18-20210506	Total/NA	Water	537 (modified)	487831
320-73382-6	EFFLUENT-PERM-20210506	Total/NA	Water	537 (modified)	487831
MB 320-487831/1-A	Method Blank	Total/NA	Water	537 (modified)	487831
LCS 320-487831/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	487831
LCSD 320-487831/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	487831

Prep Batch: 488275

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-7	BIOSOLIDS-A-20210506	Total/NA	Solid	SHAKE	
320-73382-8	BIOSOLIDS-B-20210506	Total/NA	Solid	SHAKE	
320-73382-9	STRUVITE-20210506	Total/NA	Solid	SHAKE	
320-73382-15	DUP03-20210506	Total/NA	Solid	SHAKE	
MB 320-488275/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-488275/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-73382-7 MS	BIOSOLIDS-A-20210506	Total/NA	Solid	SHAKE	
320-73382-7 MSD	BIOSOLIDS-A-20210506	Total/NA	Solid	SHAKE	

Prep Batch: 488328

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-13	DUP01-20210506	Total/NA	Water	3535	
320-73382-14	DUP02-20210506	Total/NA	Water	3535	
320-73382-17	EB01-20210504	Total/NA	Water	3535	
320-73382-18	FB01-20210506	Total/NA	Water	3535	
320-73382-19	FB02-20210506	Total/NA	Water	3535	
320-73382-20	FB03-20210506	Total/NA	Water	3535	
MB 320-488328/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-488328/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-488328/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 488349

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-1	INFLUENT-02-20210506	Total/NA	Water	537 (modified)	487831
320-73382-2	INFLUENT-07-20210506	Total/NA	Water	537 (modified)	487831
320-73382-3	INFLUENT-08-20210506	Total/NA	Water	537 (modified)	487831
320-73382-4	INFLUENT-11-20210506	Total/NA	Water	537 (modified)	487831

Analysis Batch: 488566

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-13	DUP01-20210506	Total/NA	Water	537 (modified)	488328

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QC Association Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

LCMS (Continued)

Analysis Batch: 488566 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-14	DUP02-20210506	Total/NA	Water	537 (modified)	488328
320-73382-17	EB01-20210504	Total/NA	Water	537 (modified)	488328
320-73382-18	FB01-20210506	Total/NA	Water	537 (modified)	488328
320-73382-19	FB02-20210506	Total/NA	Water	537 (modified)	488328
320-73382-20	FB03-20210506	Total/NA	Water	537 (modified)	488328
MB 320-488328/1-A	Method Blank	Total/NA	Water	537 (modified)	488328
LCS 320-488328/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	488328
LCSD 320-488328/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	488328

Analysis Batch: 488922

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-9	STRUVITE-20210506	Total/NA	Solid	537 (modified)	488275
MB 320-488275/1-A	Method Blank	Total/NA	Solid	537 (modified)	488275
LCS 320-488275/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	488275

Analysis Batch: 489473

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-7	BIOSOLIDS-A-20210506	Total/NA	Solid	537 (modified)	488275
320-73382-8	BIOSOLIDS-B-20210506	Total/NA	Solid	537 (modified)	488275
320-73382-15	DUP03-20210506	Total/NA	Solid	537 (modified)	488275
320-73382-7 MS	BIOSOLIDS-A-20210506	Total/NA	Solid	537 (modified)	488275
320-73382-7 MSD	BIOSOLIDS-A-20210506	Total/NA	Solid	537 (modified)	488275

Prep Batch: 490187

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-10	POLYMER-1-20210506	Total/NA	Liquid	Dispersion Prep	
320-73382-11	POLYMER-2-20210506	Total/NA	Liquid	Dispersion Prep	
320-73382-12	POLYMER-3-20210506	Total/NA	Liquid	Dispersion Prep	
320-73382-16	DUP04-20210506	Total/NA	Liquid	Dispersion Prep	
MB 320-490187/1-A	Method Blank	Total/NA	Liquid	Dispersion Prep	
LCS 320-490187/2-A	Lab Control Sample	Total/NA	Liquid	Dispersion Prep	
LCSD 320-490187/3-A	Lab Control Sample Dup	Total/NA	Liquid	Dispersion Prep	

Analysis Batch: 491179

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-490187/1-A	Method Blank	Total/NA	Liquid	537 (modified)	490187
LCS 320-490187/2-A	Lab Control Sample	Total/NA	Liquid	537 (modified)	490187
LCSD 320-490187/3-A	Lab Control Sample Dup	Total/NA	Liquid	537 (modified)	490187

Analysis Batch: 491384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-10	POLYMER-1-20210506	Total/NA	Liquid	537 (modified)	490187
320-73382-11	POLYMER-2-20210506	Total/NA	Liquid	537 (modified)	490187
320-73382-12	POLYMER-3-20210506	Total/NA	Liquid	537 (modified)	490187
320-73382-16	DUP04-20210506	Total/NA	Liquid	537 (modified)	490187

Prep Batch: 492151

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-10 - RE	POLYMER-1-20210506	Total/NA	Liquid	Dispersion Prep	
320-73382-11 - RE	POLYMER-2-20210506	Total/NA	Liquid	Dispersion Prep	
320-73382-12 - RE	POLYMER-3-20210506	Total/NA	Liquid	Dispersion Prep	

Eurofins TestAmerica, Sacramento

QC Association Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

LCMS (Continued)

Prep Batch: 492151 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-16 - RE	DUP04-20210506	Total/NA	Liquid	Dispersion Prep	
MB 320-492151/1-A	Method Blank	Total/NA	Liquid	Dispersion Prep	
LCS 320-492151/2-A	Lab Control Sample	Total/NA	Liquid	Dispersion Prep	
LCSD 320-492151/3-A	Lab Control Sample Dup	Total/NA	Liquid	Dispersion Prep	

Analysis Batch: 492614

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-10 - RE	POLYMER-1-20210506	Total/NA	Liquid	537 (modified)	492151
320-73382-11 - RE	POLYMER-2-20210506	Total/NA	Liquid	537 (modified)	492151
320-73382-12 - RE	POLYMER-3-20210506	Total/NA	Liquid	537 (modified)	492151
320-73382-16 - RE	DUP04-20210506	Total/NA	Liquid	537 (modified)	492151
MB 320-492151/1-A	Method Blank	Total/NA	Liquid	537 (modified)	492151
LCS 320-492151/2-A	Lab Control Sample	Total/NA	Liquid	537 (modified)	492151
LCSD 320-492151/3-A	Lab Control Sample Dup	Total/NA	Liquid	537 (modified)	492151

General Chemistry

Analysis Batch: 488284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-7	BIOSOLIDS-A-20210506	Total/NA	Solid	D 2216	
320-73382-8	BIOSOLIDS-B-20210506	Total/NA	Solid	D 2216	

Analysis Batch: 488512

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-15	DUP03-20210506	Total/NA	Solid	D 2216	

Analysis Batch: 598401

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-1	INFLUENT-02-20210506	Total/NA	Water	SM 2540D	
320-73382-2	INFLUENT-07-20210506	Total/NA	Water	SM 2540D	
320-73382-3	INFLUENT-08-20210506	Total/NA	Water	SM 2540D	
320-73382-4	INFLUENT-11-20210506	Total/NA	Water	SM 2540D	
320-73382-5	INFLUENT-18-20210506	Total/NA	Water	SM 2540D	
320-73382-6	EFFLUENT-PERM-20210506	Total/NA	Water	SM 2540D	
MB 500-598401/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 500-598401/2	Lab Control Sample	Total/NA	Water	SM 2540D	

Analysis Batch: 598489

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-1	INFLUENT-02-20210506	Total/NA	Water	SM 2540B	
320-73382-2	INFLUENT-07-20210506	Total/NA	Water	SM 2540B	
320-73382-3	INFLUENT-08-20210506	Total/NA	Water	SM 2540B	
320-73382-4	INFLUENT-11-20210506	Total/NA	Water	SM 2540B	
320-73382-5	INFLUENT-18-20210506	Total/NA	Water	SM 2540B	
320-73382-6	EFFLUENT-PERM-20210506	Total/NA	Water	SM 2540B	
MB 500-598489/1	Method Blank	Total/NA	Water	SM 2540B	
LCS 500-598489/2	Lab Control Sample	Total/NA	Water	SM 2540B	

Lab Chronicle

Client: TRC Environmental Corporation.

Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: INFLUENT-02-20210506

Lab Sample ID: 320-73382-1

Matrix: Water

Date Collected: 05/06/21 08:25

Date Received: 05/07/21 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			308.5 mL	10.00 mL	487831	05/11/21 04:47	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			488349	05/12/21 15:11	S1M	TAL SAC
Total/NA	Analysis	SM 2540B		1	40 mL	50 mL	598489	(Start) 05/13/21 03:43 (End) 05/13/21 03:45	CLB	TAL CHI
Total/NA	Analysis	SM 2540D		1	50 mL	200 mL	598401	(Start) 05/12/21 16:31 (End) 05/12/21 16:33	SMO	TAL CHI

Client Sample ID: INFLUENT-07-20210506

Lab Sample ID: 320-73382-2

Matrix: Water

Date Collected: 05/06/21 08:35

Date Received: 05/07/21 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			297.2 mL	10.00 mL	487831	05/11/21 04:47	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			488349	05/12/21 15:20	S1M	TAL SAC
Total/NA	Analysis	SM 2540B		1	40 mL	50 mL	598489	(Start) 05/13/21 03:45 (End) 05/13/21 03:47	CLB	TAL CHI
Total/NA	Analysis	SM 2540D		1	30 mL	200 mL	598401	(Start) 05/12/21 16:33 (End) 05/12/21 16:34	SMO	TAL CHI

Client Sample ID: INFLUENT-08-20210506

Lab Sample ID: 320-73382-3

Matrix: Water

Date Collected: 05/06/21 08:43

Date Received: 05/07/21 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			295.2 mL	10.00 mL	487831	05/11/21 04:47	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			488349	05/12/21 15:29	S1M	TAL SAC
Total/NA	Analysis	SM 2540B		1	40 mL	50 mL	598489	(Start) 05/13/21 03:47 (End) 05/13/21 03:49	CLB	TAL CHI
Total/NA	Analysis	SM 2540D		1	30 mL	200 mL	598401	(Start) 05/12/21 16:34 (End) 05/12/21 16:35	SMO	TAL CHI

Client Sample ID: INFLUENT-11-20210506

Lab Sample ID: 320-73382-4

Matrix: Water

Date Collected: 05/06/21 08:47

Date Received: 05/07/21 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			289 mL	10.00 mL	487831	05/11/21 04:47	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			488349	05/12/21 15:39	S1M	TAL SAC

Eurofins TestAmerica, Sacramento

Lab Chronicle

Client: TRC Environmental Corporation.

Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: INFLUENT-11-20210506

Date Collected: 05/06/21 08:47

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540B		1	40 mL	50 mL	598489		CLB	TAL CHI
Total/NA	Analysis	SM 2540D		1	30 mL	200 mL	598401	(Start) 05/12/21 16:35 (End) 05/12/21 16:37	SMO	TAL CHI

Client Sample ID: INFLUENT-18-20210506

Date Collected: 05/06/21 08:53

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			304.2 mL	10.00 mL	487831	05/11/21 04:47	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			488134	05/12/21 06:07	GMK	TAL SAC
Total/NA	Analysis	SM 2540B		1	40 mL	50 mL	598489	(Start) 05/13/21 03:51 (End) 05/13/21 03:53	CLB	TAL CHI
Total/NA	Analysis	SM 2540D		1	30 mL	200 mL	598401	(Start) 05/12/21 16:37 (End) 05/12/21 16:38	SMO	TAL CHI

Client Sample ID: EFFLUENT-PERM-20210506

Date Collected: 05/06/21 09:00

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			285.2 mL	10.00 mL	487831	05/11/21 04:47	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			488134	05/12/21 06:16	GMK	TAL SAC
Total/NA	Analysis	SM 2540B		1	50 mL	50 mL	598489	(Start) 05/13/21 03:53 (End) 05/13/21 03:55	CLB	TAL CHI
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	598401	(Start) 05/12/21 16:38 (End) 05/12/21 16:40	SMO	TAL CHI

Client Sample ID: BIOSOLIDS-A-20210506

Date Collected: 05/06/21 09:31

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-7

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			488284	05/12/21 11:57	KDB	TAL SAC

Eurofins TestAmerica, Sacramento

Lab Chronicle

Client: TRC Environmental Corporation.

Job ID: 320-73382-1

Project/Site: MMSD PFAS

Client Sample ID: BIOSOLIDS-A-20210506

Date Collected: 05/06/21 09:31

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-7

Matrix: Solid

Percent Solids: 26.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.69 g	10.00 mL	488275	05/12/21 11:27	AM	TAL SAC
Total/NA	Analysis	537 (modified)		10			489473	05/16/21 05:28	RS1	TAL SAC

Client Sample ID: BIOSOLIDS-B-20210506

Date Collected: 05/06/21 10:55

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-8

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			488284	05/12/21 11:57	KDB	TAL SAC

Client Sample ID: BIOSOLIDS-B-20210506

Date Collected: 05/06/21 10:55

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-8

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.52 g	10.00 mL	488275	05/12/21 11:27	AM	TAL SAC
Total/NA	Analysis	537 (modified)		10			489473	05/16/21 05:56	RS1	TAL SAC

Client Sample ID: STRUVITE-20210506

Date Collected: 05/06/21 10:10

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-9

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.27 g	10.00 mL	488275	05/12/21 11:27	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			488922	05/14/21 03:53	JRB	TAL SAC

Client Sample ID: POLYMER-1-20210506

Date Collected: 05/06/21 10:40

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-10

Matrix: Liquid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Dispersion Prep	RE		0.52 g	10.0 mL	492151	05/24/21 13:33	EH	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			492614	05/26/21 01:31	JRB	TAL SAC
Total/NA	Prep	Dispersion Prep			2.02 g	10.00 mL	490187	05/18/21 13:00	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			491384	05/21/21 10:19	S1M	TAL SAC

Client Sample ID: POLYMER-2-20210506

Date Collected: 05/06/21 09:50

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-11

Matrix: Liquid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Dispersion Prep	RE		0.53 g	10.0 mL	492151	05/24/21 13:33	EH	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			492614	05/26/21 01:40	JRB	TAL SAC
Total/NA	Prep	Dispersion Prep			2.24 g	10.00 mL	490187	05/18/21 13:00	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			491384	05/21/21 10:28	S1M	TAL SAC

Eurofins TestAmerica, Sacramento

Lab Chronicle

Client: TRC Environmental Corporation.

Job ID: 320-73382-1

Project/Site: MMSD PFAS

Client Sample ID: POLYMER-3-20210506

Lab Sample ID: 320-73382-12

Matrix: Liquid

Date Collected: 05/06/21 10:25

Date Received: 05/07/21 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Dispersion Prep	RE		0.53 g	10.0 mL	492151	05/24/21 13:33	EH	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			492614	05/26/21 01:50	JRB	TAL SAC
Total/NA	Prep	Dispersion Prep			2.13 g	10.00 mL	490187	05/18/21 13:00	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			491384	05/21/21 10:37	S1M	TAL SAC

Client Sample ID: DUP01-20210506

Lab Sample ID: 320-73382-13

Matrix: Water

Date Collected: 05/06/21 00:00

Date Received: 05/07/21 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			298.7 mL	10.0 mL	488328	05/12/21 12:16	LN	TAL SAC
Total/NA	Analysis	537 (modified)		1			488566	05/13/21 06:59	JY1	TAL SAC

Client Sample ID: DUP02-20210506

Lab Sample ID: 320-73382-14

Matrix: Water

Date Collected: 05/06/21 00:00

Date Received: 05/07/21 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			271.3 mL	10.0 mL	488328	05/12/21 12:16	LN	TAL SAC
Total/NA	Analysis	537 (modified)		1			488566	05/13/21 07:09	JY1	TAL SAC

Client Sample ID: DUP03-20210506

Lab Sample ID: 320-73382-15

Matrix: Solid

Date Collected: 05/06/21 00:00

Date Received: 05/07/21 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			488512	05/12/21 16:27	KDB	TAL SAC

Client Sample ID: DUP03-20210506

Lab Sample ID: 320-73382-15

Matrix: Solid

Percent Solids: 6.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.16 g	10.00 mL	488275	05/12/21 11:27	AM	TAL SAC
Total/NA	Analysis	537 (modified)		10			489473	05/16/21 06:06	RS1	TAL SAC

Client Sample ID: DUP04-20210506

Lab Sample ID: 320-73382-16

Matrix: Liquid

Date Collected: 05/06/21 00:00

Date Received: 05/07/21 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Dispersion Prep	RE		0.52 g	10.0 mL	492151	05/24/21 13:33	EH	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			492614	05/26/21 01:59	JRB	TAL SAC
Total/NA	Prep	Dispersion Prep			2.15 g	10.00 mL	490187	05/18/21 13:00	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			491384	05/21/21 10:46	S1M	TAL SAC

Eurofins TestAmerica, Sacramento

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Client Sample ID: EB01-20210504

Lab Sample ID: 320-73382-17

Matrix: Water

Date Collected: 05/04/21 16:00
Date Received: 05/07/21 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			272.9 mL	10.0 mL	488328	05/12/21 12:16	LN	TAL SAC
Total/NA	Analysis	537 (modified)		1			488566	05/13/21 07:18	JY1	TAL SAC

Client Sample ID: FB01-20210506

Lab Sample ID: 320-73382-18

Matrix: Water

Date Collected: 05/06/21 09:09
Date Received: 05/07/21 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			284.5 mL	10.0 mL	488328	05/12/21 12:16	LN	TAL SAC
Total/NA	Analysis	537 (modified)		1			488566	05/13/21 07:28	JY1	TAL SAC

Client Sample ID: FB02-20210506

Lab Sample ID: 320-73382-19

Matrix: Water

Date Collected: 05/06/21 11:15
Date Received: 05/07/21 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			271.2 mL	10.0 mL	488328	05/12/21 12:16	LN	TAL SAC
Total/NA	Analysis	537 (modified)		1			488566	05/13/21 07:37	JY1	TAL SAC

Client Sample ID: FB03-20210506

Lab Sample ID: 320-73382-20

Matrix: Water

Date Collected: 05/06/21 11:35
Date Received: 05/07/21 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			287.7 mL	10.0 mL	488328	05/12/21 12:16	LN	TAL SAC
Total/NA	Analysis	537 (modified)		1			488566	05/13/21 08:05	JY1	TAL SAC

Laboratory References:

TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	02-20-24
ANAB	Dept. of Defense ELAP	L2468	01-20-24
ANAB	Dept. of Energy	L2468.01	01-20-24
ANAB	ISO/IEC 17025	L2468	01-20-24
Arizona	State	AZ0708	08-11-21
Arkansas DEQ	State	88-0691	06-17-21
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-21
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-21
Georgia	State	4040	01-29-22
Hawaii	State	<cert No.>	01-29-22
Illinois	NELAP	200060	03-18-22
Kansas	NELAP	E-10375	10-31-21
Louisiana	NELAP	01944	06-30-21
Maine	State	CA00004	04-14-22
Michigan	State	9947	01-29-22
Nevada	State	CA000442021-2	07-31-21
New Hampshire	NELAP	2997	04-18-22
New Jersey	NELAP	CA005	06-30-21
New York	NELAP	11666	04-01-22
Ohio	State	41252	01-29-22
Oregon	NELAP	4040	01-30-23
Texas	NELAP	T104704399-19-13	05-31-21
US Fish & Wildlife	US Federal Programs	58448	07-31-21
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442021-12	03-01-22
Virginia	NELAP	460278	03-14-22
Washington	State	C581	05-05-22
West Virginia (DW)	State	9930C	12-31-21
Wisconsin	State	998204680	08-31-21
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins TestAmerica, Sacramento

Accreditation/Certification Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Laboratory: Eurofins TestAmerica, Chicago

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2903	04-30-21 *
Georgia	State	N/A	04-29-22
Georgia (DW)	State	939	04-30-21 *
Hawaii	State	NA	04-29-22
Illinois	NELAP	IL00035	04-29-22
Indiana	State	C-IL-02	06-29-21
Iowa	State	082	05-01-22
Kansas	NELAP	E-10161	10-31-21
Kentucky (UST)	State	AI # 108083	04-29-21 *
Kentucky (WW)	State	KY90023	12-31-21
Louisiana	NELAP	02046	06-30-21
Mississippi	State	NA	04-30-20 *
North Carolina (WW/SW)	State	291	12-31-21
North Dakota	State	R-194	04-29-22
Oklahoma	State	8908	08-31-21
South Carolina	State	77001003	04-29-21 *
USDA	US Federal Programs	P330-18-00018	02-11-24
Wisconsin	State	999580010	08-31-21
Wyoming	State	8TMS-Q	04-30-22

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins TestAmerica, Sacramento

Method Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC
SM 2540B	Solids, Total	SM	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC
Dispersion Prep	Solid-Phase Extraction (SPE)	None	TAL SAC
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	TAL SAC

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-73382-1	INFLUENT-02-20210506	Water	05/06/21 08:25	05/07/21 10:05	
320-73382-2	INFLUENT-07-20210506	Water	05/06/21 08:35	05/07/21 10:05	
320-73382-3	INFLUENT-08-20210506	Water	05/06/21 08:43	05/07/21 10:05	
320-73382-4	INFLUENT-11-20210506	Water	05/06/21 08:47	05/07/21 10:05	
320-73382-5	INFLUENT-18-20210506	Water	05/06/21 08:53	05/07/21 10:05	
320-73382-6	EFFLUENT-PERM-20210506	Water	05/06/21 09:00	05/07/21 10:05	
320-73382-7	BIOSOLIDS-A-20210506	Solid	05/06/21 09:31	05/07/21 10:05	
320-73382-8	BIOSOLIDS-B-20210506	Solid	05/06/21 10:55	05/07/21 10:05	
320-73382-9	STRUVITE-20210506	Solid	05/06/21 10:10	05/07/21 10:05	
320-73382-10	POLYMER-1-20210506	Liquid	05/06/21 10:40	05/07/21 10:05	
320-73382-11	POLYMER-2-20210506	Liquid	05/06/21 09:50	05/07/21 10:05	
320-73382-12	POLYMER-3-20210506	Liquid	05/06/21 10:25	05/07/21 10:05	
320-73382-13	DUP01-20210506	Water	05/06/21 00:00	05/07/21 10:05	
320-73382-14	DUP02-20210506	Water	05/06/21 00:00	05/07/21 10:05	
320-73382-15	DUP03-20210506	Solid	05/06/21 00:00	05/07/21 10:05	
320-73382-16	DUP04-20210506	Liquid	05/06/21 00:00	05/07/21 10:05	
320-73382-17	EB01-20210504	Water	05/04/21 16:00	05/07/21 10:05	
320-73382-18	FB01-20210506	Water	05/06/21 09:09	05/07/21 10:05	
320-73382-19	FB02-20210506	Water	05/06/21 11:15	05/07/21 10:05	
320-73382-20	FB03-20210506	Water	05/06/21 11:35	05/07/21 10:05	

Eurofins TestAmerica, Sacramento

Chain of Custody Record

eurofins | Environment Testing
TestAmerica

Address: _____

Regulatory Program: <input type="checkbox"/> DW <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> Other:										COC No.: <u>1</u> of <u>2</u> COCs		
Client Contact		Project Manager: Mike Ursin Tel>Email: Murzin@trccompanics.com		Site Contact: Altucker		Date: 5/6/2021		Carrier:		COC No.: <u>1</u> of <u>2</u> COCs		
Company Name: TRC Address: 708 Heartland Trail, Suite 3000 City/State/Zip: Madison, WI 53717 Phone: (605) 275-6478 Fax: _____ Project Name: MMSD PFAS Site: MMSD PO#		Analysis Turnaround Time <input checked="" type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day								Sampler: Lydia Auner For Lab Use Only: Walk-in Client: Lab Sampling: Job/SDG No.: _____		
TOP ASSAY PFAS LI 33 List Perform MS/MS (Y/N) Preferred Sample (Y/N)												
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sample Specific Notes:		320-73382 Chain of Custody			
INFLUENT-02 - 20210506	5/6/21	8:25	C	WW	3	N N X X						
INFLUENT - 07 - 20210506	5/6/21	8:35	C	WW	3	N N X X						
INFLUENT - 08 - 20210506	5/6/21	8:43	C	WW	3	N N X X						
INFLUENT - 11 - 20210506	5/6/21	8:47	C	WW	3	N N X X						
INFLUENT - 18 - 20210506	5/6/21	8:53	C	WW	3	N N X X						
EFFLUENT - PERM - 20210506	5/6/21	9:00	C	WW	3	N N X X						
BIOsolids-A - 20210506	5/6/21	9:31	C	S	2	N N X X						
BIOsolids-B - 20210506	5/6/21	10:55	C	S	2	N N X X						
STRUvITE - 20210506	5/6/21	10:10	G	S	1	N N X X						
POLyMER - 1 - 20210506	5/6/21	10:40	G	S	1	N N X X						
POLyMER - 2 - 20210506	5/6/21	9:50	G	S	1	N N X X						
POLyMER - 3 - 20210506	5/6/21	10:25	G	S	1	N N X X						
Preservation Used: 1=Ice, 2=HCl; 3=H2SO4; 4=HNO3; 5=NaOH; 6=Other												
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.												
<input type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input type="checkbox"/> Unknown			<input type="checkbox"/> Return to Client	<input type="checkbox"/> Disposal by Lab	<input type="checkbox"/> Archive for _____ Months			
Special Instructions/QC Requirements & Comments: X 6 containers Df 5/7/21												
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.: <u>143480011490745</u>		Cooler Temp. (°C): Obsd: <u>1.0</u> Corrd: <u>1.0</u>		Therm ID No.: <u>W1</u>		Company: <u>TRC</u>		Date/Time: <u>5/6/21 16:00</u>		
Relinquished by: <u>Jyden Juhn</u>				Received by: <u>S</u>				Company: <u>Eurofins</u>		Date/Time: <u>5/7/21 10:05</u>		
Relinquished by:				Received by: <u>J</u>				Company: _____		Date/Time: _____		
Relinquished by:				Received in Laboratory by:				Company: _____		Date/Time: _____		



Chain of Custody Record

eurofins

413253

Chain of Custody Record

Environment Testing
TestAmerica

Address: _____

Regulatory Program: DW NPDES RCRA Other:

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Chain of Custody Record



eurofins

Client Information (Sub Contract Lab)		Sampler		Lab PM Alltucker David R		Carrier Tracking No(s)		COC No 320-223370 1	
Client Contact Shipping/Receiving		Phone		E-Mail David Alltucker@Eurofinset.com		State of Origin Wisconsin		Page Page 1 of 1	
Company TestAmerica Laboratories Inc				Accreditations Required (See note)				Job #: 320-73382 1	
Address 2417 Bond Street		Due Date Requested 5/27/2021				Analysis Requested		Preservation Codes	
City University Park		TAT Requested (day:						A HCL B NaOH C Zn Acetate D Nitric Acid E NaHSO4 F MeOH G Amchlor H Ascorbic Acid I Ice J DI Water K EDTA L EDA	M Hexane N None O AsNaO2 P Na2O4S Q Na2SO3 R Na2S2O3 S H2SO4 T TSP Dodecahydrate U Acetone V MCAA W pH 4-5 Z other (specify)
State Zip IL 60484		PO #:		320-73382 COC					
Phone 708-534-5200(Tel) 708-534-5211(Fax)		Email		WO #:					
Project Name PFAS Testing		Project # 32017530							
Site		SSOW#:							
Sample Identification - Client ID (Lab ID)		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Number of containers	Special Instructions/Note
						<input checked="" type="checkbox"/> 2540D	<input checked="" type="checkbox"/> SM2540B		
INFLUENT-02 20210506 (320-73382 1)		5/6/21	08 25 Central		Water	X	X		1
INFLUENT-07 20210506 (320-73382 2)		5/6/21	08 35 Central		Water	X	X		1
INFLUENT-08-20210506 (320-73382-3)		5/6/21	08 43 Central		Water	X	X		1
INFLUENT 11 20210506 (320-73382-4)		5/6/21	08 47 Central		Water	X	X		1
INFLUENT 18-20210506 (320-73382-5)		5/6/21	08 53 Central		Water	X	X		1
EFFLUENT PERM 20210506 (320-73382-6)		5/6/21	09 00 Central		Water	X	X		1
Note: Since laboratory accreditations are subject to change Eurofins TestAmerica places the ownership of method analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date return the signed Chain of Custody attesting to said compliance to Eurofins TestAmerica.									
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
Unconfirmed					<input type="checkbox"/> Return To Client	<input type="checkbox"/> Disposal By Lab	<input type="checkbox"/> Archive For	Months	
Deliverable Requested I II III IV Other (specify)					Primary Deliverable Rank 2				
					Special Instructions/QC Requirements				
Empty Kit Relinquished by			Date		Time		Method of Shipment		
Relinquished by 			Date/Time 5/10/21-1630		Company ETASAC		Received by Paulee Buckley		Date/Time 5/11/21 1025
Relinquished by			Date/Time		Company		Received by		Date/Time
Relinquished by			Date/Time		Company		Received by		Date/Time
Custody Seals Intact △ Yes △ No		Custody Seal No			Cooler Temperature(s) °C and Other Remarks 5.5				

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Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 320-73382-1

Login Number: 73382

List Source: Eurofins TestAmerica, Sacramento

List Number: 1

Creator: Oropeza, Salvador

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	1602174/1490745/1474806
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 320-73382-1

Login Number: 73382

List Source: Eurofins TestAmerica, Chicago

List Number: 2

List Creation: 05/11/21 12:25 PM

Creator: Buckley, Paula M

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Environment Testing
America



ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-73382-2
Client Project/Site: MMSD PFAS
Revision: 2

For:
TRC Environmental Corporation.
708 Heartland Trail
Madison, Wisconsin 53717

Attn: Mike Ursin

Authorized for release by:
7/6/2021 1:31:57 PM

David Alltucker, Project Manager I
(916)374-4383
David.Alltucker@Eurofinset.com

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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Qualifiers

LCMS	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
*5-	Isotope dilution analyte is outside acceptance limits, low biased.
*5+	Isotope dilution analyte is outside acceptance limits, high biased.
B	Compound was found in the blank and sample.
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: TRC Environmental Corporation.

Project/Site: MMSD PFAS

Job ID: 320-73382-2

Job ID: 320-73382-2

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative 320-73382-2

Revision 6-14-2021: This report has been revised to correct narrative comment.

Receipt

The samples were received on 5/7/2021 10:05 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 1.0° C, 2.0° C and 3.1° C.

Receipt Exceptions

The container label for the following sample(s) did not match the information listed on the Chain-of-Custody (COC):

Samples#10, 11, and 12 COC lists to receive 8 container pre-sample, however lab received 6 container pre-sample. Sample container count was logged in based on how many container received. POLYMER-1-20210506 (320-73382-10), POLYMER-2-20210506 (320-73382-11) and POLYMER-3-20210506 (320-73382-12).

LCMS

Method 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for M2-4:2 FTS in the following sample: (CCB 320-493362/1). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method 537 (modified): The labeled analyte M2-4:2FTS is employed in this analysis as a "Reverse Surrogate". It is used to monitor the oxidation efficiency of the TOP assay. This analyte is fortified into all sample fractions prior to any processing. The recovery of this analyte should be 0% in Post-Treatment fractions, indicating complete oxidation of the sample. The reverse surrogate recovery in the following method blank (MB) indicates that the MB may not have gone to complete oxidation: (MB 320-490377/1-A). The associated client samples have the reverse surrogate within the recommended range. None of the precursor analytes including 6:2 FTS, 8:2 FTS, N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA), N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA), and Perfluorooctane Sulfonamide (FOSA) were detected in the MB; therefore, there is no adverse impact to the data because of the incomplete oxidation. (MB 320-490377/1-A)

Method 537 (modified): The labeled analyte M2-4:2 FTS is employed in this analysis as a "Reverse Surrogate". It is used to monitor the oxidation efficiency of the TOP assay. This analyte is fortified into all sample fractions prior to any processing. The recovery of this analyte should be 0% in Post-Treatment fractions, indicating complete oxidation of the sample. POLYMER-1-20210506 (320-73382-10), POLYMER-2-20210506 (320-73382-11), POLYMER-3-20210506 (320-73382-12), (LCS 320-490373/2-A), (LCS 320-490377/2-A), (LCSD 320-490373/3-A), (LCSD 320-490377/3-A), (MB 320-490373/1-A) and (MB 320-490377/1-A)

Method 537 (modified): The labeled analyte M2-4:2 FTS is converted to PFBA during the oxidation step of the TOP assay. The PFBA result in the Post-Treatment Method Blank (MB) indicates how much of a field sample's Post-Treatment PFBA result is contributed by the Reverse Surrogate, when adjusted for dilution factors. (MB 320-490377/1-A)

Method 537 (modified): Zero percent recovery of precursor analytes, 4:2 FTS, 6:2 FTS, 8:2 FTS, FOSA, NMeFOSAA, and NEtFOSAA, and enhanced recoveries of PFCAs is observed in the Post-Treatment Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD) associated with these samples, consistent with the expected oxidation of precursor analytes. (LCS 320-490377/2-A) and (LCSD 320-490377/3-A)

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit for several IDA: POLYMER-1-20210506 (320-73382-10), POLYMER-2-20210506 (320-73382-11) and POLYMER-3-20210506 (320-73382-12). The samples were re-extracted outside of holding time with no significant improvement in QC parameters. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was outside of the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty, and the reported value may have some high bias. However, analyst judgment was used to positively identify the analyte.

Case Narrative

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Job ID: 320-73382-2 (Continued)

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method TOPS Post Prep: Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: POLYMER-1-20210506 (320-73382-10), POLYMER-2-20210506 (320-73382-11) and POLYMER-3-20210506 (320-73382-12). A 2mL sample aliquote of the samples was taken and they were extracted as-per SOP. This is a 62.5x dilution of the sample. The reporting limits (RLs) have been adjusted proportionately.

preparation batch 320-490377

Method TOPS Post Prep: The following samples were orange prior to extraction: POLYMER-1-20210506 (320-73382-10), POLYMER-2-20210506 (320-73382-11) and POLYMER-3-20210506 (320-73382-12).

Method TOPS Post Prep: The following samples were yellow prior to extraction: POLYMER-1-20210506 (320-73382-10) and POLYMER-2-20210506 (320-73382-11).

Method TOPS Post Prep: The following samples were yellow after extraction/final volume: POLYMER-1-20210506 (320-73382-10), POLYMER-2-20210506 (320-73382-11) and POLYMER-3-20210506 (320-73382-12).

preparation batch 320-490377

Method TOPS Pre Prep: Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: POLYMER-1-20210506 (320-73382-10), POLYMER-2-20210506 (320-73382-11) and POLYMER-3-20210506 (320-73382-12). A 2mL sample aliquote of the samples was taken and they were extracted as-per SOP. This is a 62.5x dilution of the sample. The reporting limits (RLs) have been adjusted proportionately.

preparaton batch 320-493693

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Client Sample ID: POLYMER-1-20210506

Lab Sample ID: 320-73382-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorotetradecanoic acid (PFTeA)	0.25	J	0.49	0.14	ug/Kg	1		537 (modified)	Pre-Treatment
Perfluorobutanoic acid (PFBA)	0.38	J B	0.50	0.069	ug/Kg	1		537 (modified)	Post-Treatment
Perfluorohexanoic acid (PFHxA)	0.30	J B *+	0.50	0.11	ug/Kg	1		537 (modified)	Post-Treatment
Perfluorooctanesulfonic acid (PFOS)	1.3	I	1.2	0.50	ug/Kg	1		537 (modified)	Post-Treatment
PFBA	0.38				ug/Kg	1		Total PFCA-Dif	Total/NA
PFPA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
PFHxA	0.30				ug/Kg	1		Total PFCA-Dif	Total/NA
PFHpA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
PFOA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
PFNA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
Total PFCA	0.68				ug/Kg	1		Total PFCA-Dif	Total/NA
Total PFCA	0.00				ug/Kg	1		Total PFCA-Sum	Pre-Treatment
Total PFCA	0.68				ug/Kg	1		Total PFCA-Sum	Post-Treatment

Client Sample ID: POLYMER-2-20210506

Lab Sample ID: 320-73382-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	8.1	B	0.50	0.070	ug/Kg	1		537 (modified)	Post-Treatment
PFBA	8.1				ug/Kg	1		Total PFCA-Dif	Total/NA
PFPA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
PFHxA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
PFHpA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
PFOA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
PFNA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
Total PFCA	8.1				ug/Kg	1		Total PFCA-Dif	Total/NA
Total PFCA	0.00				ug/Kg	1		Total PFCA-Sum	Pre-Treatment
Total PFCA	8.1				ug/Kg	1		Total PFCA-Sum	Post-Treatment

Client Sample ID: POLYMER-3-20210506

Lab Sample ID: 320-73382-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorotetradecanoic acid (PFTeA)	0.18	J	0.50	0.14	ug/Kg	1		537 (modified)	Pre-Treatment
Perfluorooctanesulfonic acid (PFOS)	1.0	J	1.2	0.50	ug/Kg	1		537 (modified)	Pre-Treatment
PFBA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
PFPA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
PFHxA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
PFHpA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
PFOA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
PFNA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
Total PFCA	0.00				ug/Kg	1		Total PFCA-Dif	Total/NA
Total PFCA	0.00				ug/Kg	1		Total PFCA-Sum	Pre-Treatment
Total PFCA	0.00				ug/Kg	1		Total PFCA-Sum	Post-Treatment

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Client Sample ID: POLYMER-1-20210506

Lab Sample ID: 320-73382-10

Matrix: Liquid

Date Collected: 05/06/21 10:40
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances - Pre-Treatment

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.069		0.49	0.069	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluoropentanoic acid (PFPeA)	<0.19		0.49	0.19	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluorohexanoic acid (PFHxA)	<0.11		0.49	0.11	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluoroheptanoic acid (PFHpA)	<0.072		0.49	0.072	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluorooctanoic acid (PFOA)	<0.22		0.49	0.22	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluorononanoic acid (PFNA)	<0.088		0.49	0.088	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluorodecanoic acid (PFDA)	<0.054		0.49	0.054	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluoroundecanoic acid (PFUnA)	<0.088		0.49	0.088	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluorododecanoic acid (PFDoA)	<0.17		0.49	0.17	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluorotridecanoic acid (PFTrDA)	<0.13		0.49	0.13	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluorotetradecanoic acid (PFTeA)	0.25 J		0.49	0.14	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluorobutanesulfonic acid (PFBS)	<0.062		0.49	0.062	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluorohexanesulfonic acid (PFHxS)	<0.076		0.49	0.076	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.086		0.49	0.086	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluoroctanesulfonic acid (PFOS)	<0.49		1.2	0.49	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluorodecanesulfonic acid (PFDS)	<0.096		0.49	0.096	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
Perfluorooctanesulfonamide (FOSA)	<0.21		0.49	0.21	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
NMeFOSAA	<0.96		4.9	0.96	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
NEtFOSAA	<0.91		4.9	0.91	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
6:2 FTS	<0.37		4.9	0.37	ug/Kg	05/18/21 19:45	05/27/21 11:24		1
8:2 FTS	<0.62		4.9	0.62	ug/Kg	05/18/21 19:45	05/27/21 11:24		1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	0.5 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
13C5 PFPeA	1 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
13C2 PFHxA	2 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
13C4 PFHpA	4 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
13C4 PFOA	11 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
13C5 PFNA	18 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
13C2 PFDA	14 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
13C2 PFUnA	8 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
13C2 PFDoA	5 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
13C2 PFTeDA	2 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
13C3 PFBS	16 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
18O2 PFHxS	54		25 - 150	05/18/21 19:45	05/27/21 11:24	1
13C4 PFOS	36		25 - 150	05/18/21 19:45	05/27/21 11:24	1
13C8 FOSA	24 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
d3-NMeFOSAA	10 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
d5-NEtFOSAA	11 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
M2-6:2 FTS	6 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1
M2-8:2 FTS	35		25 - 150	05/18/21 19:45	05/27/21 11:24	1
M2-4:2 FTS	3 *5-		25 - 150	05/18/21 19:45	05/27/21 11:24	1

Method: 537 (modified) - Fluorinated Alkyl Substances - Post-Treatment

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.38 J B		0.50	0.069	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluoropentanoic acid (PFPeA)	<0.19 *+		0.50	0.19	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluorohexanoic acid (PFHxA)	0.30 J B *+		0.50	0.11	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluoroheptanoic acid (PFHpA)	<0.072		0.50	0.072	ug/Kg	05/18/21 19:53	05/27/21 13:06		1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Client Sample ID: POLYMER-1-20210506

Lab Sample ID: 320-73382-10

Matrix: Liquid

Date Collected: 05/06/21 10:40
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances - Post-Treatment (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroctanoic acid (PFOA)	<0.22		0.50	0.22	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluorononanoic acid (PFNA)	<0.089		0.50	0.089	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluorodecanoic acid (PFDA)	<0.054		0.50	0.054	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluoroundecanoic acid (PFUnA)	<0.089		0.50	0.089	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluorododecanoic acid (PFDa)	<0.17		0.50	0.17	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluorotridecanoic acid (PFTrDA)	<0.13		0.50	0.13	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluorotetradecanoic acid (PFTeA)	<0.14		0.50	0.14	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluorobutanesulfonic acid (PFBS)	<0.062		0.50	0.062	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluorohexanesulfonic acid (PFHxS)	<0.077		0.50	0.077	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.087		0.50	0.087	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluoroctanesulfonic acid (PFOS)	1.3	I		1.2	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluorodecanesulfonic acid (PFDS)	<0.097		0.50	0.097	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
Perfluoroctanesulfonamide (FOSA)	<0.21		0.50	0.21	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
NMeFOSAA	<0.97		5.0	0.97	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
NEtFOSAA	<0.92		5.0	0.92	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
6:2 FTS	<0.38		5.0	0.38	ug/Kg	05/18/21 19:53	05/27/21 13:06		1
8:2 FTS	<0.62		5.0	0.62	ug/Kg	05/18/21 19:53	05/27/21 13:06		1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	1	*5-	25 - 150	05/18/21 19:53	05/27/21 13:06	1
13C5 PFPeA	3	*5-	25 - 150	05/18/21 19:53	05/27/21 13:06	1
13C2 PFHxA	10	*5-	25 - 150	05/18/21 19:53	05/27/21 13:06	1
13C4 PFHpA	29		25 - 150	05/18/21 19:53	05/27/21 13:06	1
13C4 PFOA	46		25 - 150	05/18/21 19:53	05/27/21 13:06	1
13C5 PFNA	43		25 - 150	05/18/21 19:53	05/27/21 13:06	1
13C2 PFDA	32		25 - 150	05/18/21 19:53	05/27/21 13:06	1
13C2 PFUnA	20	*5-	25 - 150	05/18/21 19:53	05/27/21 13:06	1
13C2 PFDa	11	*5-	25 - 150	05/18/21 19:53	05/27/21 13:06	1
13C2 PFTeDA	6	*5-	25 - 150	05/18/21 19:53	05/27/21 13:06	1
13C3 PFBS	66		25 - 150	05/18/21 19:53	05/27/21 13:06	1
18O2 PFHxS	88		25 - 150	05/18/21 19:53	05/27/21 13:06	1
13C4 PFOS	67		25 - 150	05/18/21 19:53	05/27/21 13:06	1
13C8 FOSA	33		25 - 150	05/18/21 19:53	05/27/21 13:06	1
d3-NMeFOSAA	19	*5-	25 - 150	05/18/21 19:53	05/27/21 13:06	1
d5-NEtFOSAA	16	*5-	25 - 150	05/18/21 19:53	05/27/21 13:06	1
M2-6:2 FTS	53		25 - 150	05/18/21 19:53	05/27/21 13:06	1
M2-8:2 FTS	62		25 - 150	05/18/21 19:53	05/27/21 13:06	1
M2-4:2 FTS	5		0 - 10	05/18/21 19:53	05/27/21 13:06	1

Method: Total PFCA-Dif - Total PFCA (Treatment Difference)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFBA	0.38				ug/Kg			06/09/21 14:59	1
PFPA	0.00				ug/Kg			06/09/21 14:59	1
PFHxA	0.30				ug/Kg			06/09/21 14:59	1
PFHpA	0.00				ug/Kg			06/09/21 14:59	1
PFOA	0.00				ug/Kg			06/09/21 14:59	1
PFNA	0.00				ug/Kg			06/09/21 14:59	1
Total PFCA	0.68				ug/Kg			06/09/21 14:59	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Client Sample ID: POLYMER-1-20210506

Lab Sample ID: 320-73382-10

Matrix: Liquid

Date Collected: 05/06/21 10:40
Date Received: 05/07/21 10:05

Method: Total PFCA-Sum - Total PFCA (Summary) - Pre-Treatment

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total PFCA	0.00				ug/Kg			06/09/21 14:55	1

Method: Total PFCA-Sum - Total PFCA (Summary) - Post-Treatment

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total PFCA	0.68				ug/Kg			06/09/21 14:57	1

Client Sample ID: POLYMER-2-20210506

Lab Sample ID: 320-73382-11

Matrix: Liquid

Date Collected: 05/06/21 09:50
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances - Pre-Treatment

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.069		0.49	0.069	ug/Kg				1
Perfluoropentanoic acid (PFPeA)	<0.19		0.49	0.19	ug/Kg				1
Perfluorohexanoic acid (PFHxA)	<0.11		0.49	0.11	ug/Kg				1
Perfluoroheptanoic acid (PFHpA)	<0.072		0.49	0.072	ug/Kg				1
Perfluoroctanoic acid (PFOA)	<0.22		0.49	0.22	ug/Kg				1
Perfluorononanoic acid (PFNA)	<0.089		0.49	0.089	ug/Kg				1
Perfluorodecanoic acid (PFDA)	<0.054		0.49	0.054	ug/Kg				1
Perfluoroundecanoic acid (PFUnA)	<0.089		0.49	0.089	ug/Kg				1
Perfluorododecanoic acid (PFDaO)	<0.17		0.49	0.17	ug/Kg				1
Perfluorotridecanoic acid (PFTrDA)	<0.13		0.49	0.13	ug/Kg				1
Perfluorotetradecanoic acid (PFTeA)	<0.14		0.49	0.14	ug/Kg				1
Perfluorobutanesulfonic acid (PFBS)	<0.062		0.49	0.062	ug/Kg				1
Perfluorohexanesulfonic acid (PFHxS)	<0.077		0.49	0.077	ug/Kg				1
Perfluoroheptanesulfonic Acid (PFHsP)	<0.087		0.49	0.087	ug/Kg				1
Perfluoroctanesulfonic acid (PFOS)	<0.49		1.2	0.49	ug/Kg				1
Perfluorodecanesulfonic acid (PFDS)	<0.097		0.49	0.097	ug/Kg				1
Perfluorooctanesulfonamide (FOSA)	<0.21		0.49	0.21	ug/Kg				1
NMeFOSAA	<0.97		4.9	0.97	ug/Kg				1
NEtFOSAA	<0.92		4.9	0.92	ug/Kg				1
6:2 FTS	<0.37		4.9	0.37	ug/Kg				1
8:2 FTS	<0.62		4.9	0.62	ug/Kg				1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	0.4	*5-	25 - 150			1
13C5 PFPeA	1	*5-	25 - 150			1
13C2 PFHxA	2	*5-	25 - 150			1
13C4 PFHpA	5	*5-	25 - 150			1
13C4 PFOA	13	*5-	25 - 150			1
13C5 PFNA	27		25 - 150			1
13C2 PFDA	25		25 - 150			1
13C2 PFUnA	15	*5-	25 - 150			1
13C2 PFDaO	7	*5-	25 - 150			1
13C2 PFTeDA	2	*5-	25 - 150			1
13C3 PFBS	14	*5-	25 - 150			1
18O2 PFHxS	67		25 - 150			1
13C4 PFOS	63		25 - 150			1
13C8 FOSA	37		25 - 150			1
d3-NMeFOSAA	16	*5-	25 - 150			1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Client Sample ID: POLYMER-2-20210506

Lab Sample ID: 320-73382-11

Matrix: Liquid

Date Collected: 05/06/21 09:50
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances - Pre-Treatment (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	16	*5-	25 - 150	05/18/21 19:45	05/27/21 11:34	1
M2-6:2 FTS	9	*5-	25 - 150	05/18/21 19:45	05/27/21 11:34	1
M2-8:2 FTS	47		25 - 150	05/18/21 19:45	05/27/21 11:34	1
M2-4:2 FTS	4	*5-	25 - 150	05/18/21 19:45	05/27/21 11:34	1

Method: 537 (modified) - Fluorinated Alkyl Substances - Post-Treatment

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	8.1	B	0.50	0.070	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluoropentanoic acid (PFPeA)	<0.19	*+	0.50	0.19	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluorohexanoic acid (PFHxA)	<0.11	*+	0.50	0.11	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluoroheptanoic acid (PFHpA)	<0.073		0.50	0.073	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluorooctanoic acid (PFOA)	<0.22		0.50	0.22	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluorononanoic acid (PFNA)	<0.090		0.50	0.090	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluorodecanoic acid (PFDA)	<0.055		0.50	0.055	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluoroundecanoic acid (PFUnA)	<0.090		0.50	0.090	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluorododecanoic acid (PFDoA)	<0.17		0.50	0.17	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluorotridecanoic acid (PFTrDA)	<0.13		0.50	0.13	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluorotetradecanoic acid (PFTeA)	<0.14		0.50	0.14	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluorobutanesulfonic acid (PFBS)	<0.063		0.50	0.063	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluorohexanesulfonic acid (PFHxS)	<0.078		0.50	0.078	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.088		0.50	0.088	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluorooctanesulfonic acid (PFOS)	<0.50		1.2	0.50	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluorodecanesulfonic acid (PFDS)	<0.098		0.50	0.098	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
Perfluorooctanesulfonamide (FOSA)	<0.21		0.50	0.21	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
NMeFOSAA	<0.98		5.0	0.98	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
NEtFOSAA	<0.93		5.0	0.93	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
6:2 FTS	<0.38		5.0	0.38	ug/Kg	05/18/21 19:53	05/27/21 13:15		1
8:2 FTS	<0.63		5.0	0.63	ug/Kg	05/18/21 19:53	05/27/21 13:15		1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	0.5	*5-	25 - 150	05/18/21 19:53	05/27/21 13:15	1
13C5 PFPeA	3	*5-	25 - 150	05/18/21 19:53	05/27/21 13:15	1
13C2 PFHxA	17	*5-	25 - 150	05/18/21 19:53	05/27/21 13:15	1
13C4 PFHpA	41		25 - 150	05/18/21 19:53	05/27/21 13:15	1
13C4 PFOA	51		25 - 150	05/18/21 19:53	05/27/21 13:15	1
13C5 PFNA	47		25 - 150	05/18/21 19:53	05/27/21 13:15	1
13C2 PFDA	28		25 - 150	05/18/21 19:53	05/27/21 13:15	1
13C2 PFUnA	15	*5-	25 - 150	05/18/21 19:53	05/27/21 13:15	1
13C2 PFDoA	7	*5-	25 - 150	05/18/21 19:53	05/27/21 13:15	1
13C2 PFTeDA	2	*5-	25 - 150	05/18/21 19:53	05/27/21 13:15	1
13C3 PFBS	51		25 - 150	05/18/21 19:53	05/27/21 13:15	1
18O2 PFHxS	76		25 - 150	05/18/21 19:53	05/27/21 13:15	1
13C4 PFOS	49		25 - 150	05/18/21 19:53	05/27/21 13:15	1
13C8 FOSA	42		25 - 150	05/18/21 19:53	05/27/21 13:15	1
d3-NMeFOSAA	15	*5-	25 - 150	05/18/21 19:53	05/27/21 13:15	1
d5-NEtFOSAA	13	*5-	25 - 150	05/18/21 19:53	05/27/21 13:15	1
M2-6:2 FTS	86		25 - 150	05/18/21 19:53	05/27/21 13:15	1
M2-8:2 FTS	64		25 - 150	05/18/21 19:53	05/27/21 13:15	1
M2-4:2 FTS	9		0 - 10	05/18/21 19:53	05/27/21 13:15	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Client Sample ID: POLYMER-2-20210506

Lab Sample ID: 320-73382-11

Matrix: Liquid

Date Collected: 05/06/21 09:50
Date Received: 05/07/21 10:05

Method: Total PFCA-Dif - Total PFCA (Treatment Difference)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFBA	8.1				ug/Kg			06/09/21 14:59	1
PFPA	0.00				ug/Kg			06/09/21 14:59	1
PFHxA	0.00				ug/Kg			06/09/21 14:59	1
PFHpA	0.00				ug/Kg			06/09/21 14:59	1
PFOA	0.00				ug/Kg			06/09/21 14:59	1
PFNA	0.00				ug/Kg			06/09/21 14:59	1
Total PFCA	8.1				ug/Kg			06/09/21 14:59	1

Method: Total PFCA-Sum - Total PFCA (Summary) - Pre-Treatment

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total PFCA	0.00				ug/Kg			06/09/21 14:55	1

Method: Total PFCA-Sum - Total PFCA (Summary) - Post-Treatment

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total PFCA	8.1				ug/Kg			06/09/21 14:57	1

Client Sample ID: POLYMER-3-20210506

Lab Sample ID: 320-73382-12

Matrix: Liquid

Date Collected: 05/06/21 10:25
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances - Pre-Treatment

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.070		0.50	0.070	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluoropentanoic acid (PFPeA)	<0.19		0.50	0.19	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluorohexanoic acid (PFHxA)	<0.11		0.50	0.11	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluoroheptanoic acid (PFHpA)	<0.073		0.50	0.073	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluoroctanoic acid (PFOA)	<0.22		0.50	0.22	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluorononanoic acid (PFNA)	<0.090		0.50	0.090	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluorodecanoic acid (PFDA)	<0.055		0.50	0.055	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluoroundecanoic acid (PFUnA)	<0.090		0.50	0.090	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluorododecanoic acid (PFDoA)	<0.17		0.50	0.17	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluorotridecanoic acid (PFTrDA)	<0.13		0.50	0.13	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluorotetradecanoic acid (PFTeA)	0.18 J		0.50	0.14	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluorobutanesulfonic acid (PFBS)	<0.063		0.50	0.063	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluorohexanesulfonic acid (PFHxS)	<0.078		0.50	0.078	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluoroheptanesulfonic Acid (PFHsP)	<0.088		0.50	0.088	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluoroctanesulfonic acid (PFOS)	1.0 J		1.2	0.50	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluorodecanesulfonic acid (PFDS)	<0.098		0.50	0.098	ug/Kg			05/18/21 19:45	05/27/21 11:43
Perfluoroctanesulfonamide (FOSA)	<0.21		0.50	0.21	ug/Kg			05/18/21 19:45	05/27/21 11:43
NMeFOSAA	<0.98		5.0	0.98	ug/Kg			05/18/21 19:45	05/27/21 11:43
NEtFOSAA	<0.93		5.0	0.93	ug/Kg			05/18/21 19:45	05/27/21 11:43
6:2 FTS	<0.38		5.0	0.38	ug/Kg			05/18/21 19:45	05/27/21 11:43
8:2 FTS	<0.63		5.0	0.63	ug/Kg			05/18/21 19:45	05/27/21 11:43
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	0.4	*5-	25 - 150				05/18/21 19:45	05/27/21 11:43	1
13C5 PFPeA	1	*5-	25 - 150				05/18/21 19:45	05/27/21 11:43	1
13C2 PFHxA	2	*5-	25 - 150				05/18/21 19:45	05/27/21 11:43	1
13C4 PFHpA	4	*5-	25 - 150				05/18/21 19:45	05/27/21 11:43	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Client Sample ID: POLYMER-3-20210506

Lab Sample ID: 320-73382-12

Matrix: Liquid

Date Collected: 05/06/21 10:25
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances - Pre-Treatment (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	11	*5-	25 - 150	05/18/21 19:45	05/27/21 11:43	1
13C5 PFNA	23	*5-	25 - 150	05/18/21 19:45	05/27/21 11:43	1
13C2 PFDA	21	*5-	25 - 150	05/18/21 19:45	05/27/21 11:43	1
13C2 PFUnA	13	*5-	25 - 150	05/18/21 19:45	05/27/21 11:43	1
13C2 PFDoA	7	*5-	25 - 150	05/18/21 19:45	05/27/21 11:43	1
13C2 PFTeDA	3	*5-	25 - 150	05/18/21 19:45	05/27/21 11:43	1
13C3 PFBS	14	*5-	25 - 150	05/18/21 19:45	05/27/21 11:43	1
18O2 PFHxS	55		25 - 150	05/18/21 19:45	05/27/21 11:43	1
13C4 PFOS	53		25 - 150	05/18/21 19:45	05/27/21 11:43	1
13C8 FOSA	30		25 - 150	05/18/21 19:45	05/27/21 11:43	1
d3-NMeFOSAA	15	*5-	25 - 150	05/18/21 19:45	05/27/21 11:43	1
d5-NEtFOSAA	14	*5-	25 - 150	05/18/21 19:45	05/27/21 11:43	1
M2-6:2 FTS	6	*5-	25 - 150	05/18/21 19:45	05/27/21 11:43	1
M2-8:2 FTS	39		25 - 150	05/18/21 19:45	05/27/21 11:43	1
M2-4:2 FTS	3	*5-	25 - 150	05/18/21 19:45	05/27/21 11:43	1

Method: 537 (modified) - Fluorinated Alkyl Substances - Post-Treatment

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.069		0.49	0.069	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluoropentanoic acid (PFPeA)	<0.19	*+	0.49	0.19	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluorohexanoic acid (PFHxA)	<0.11	*+	0.49	0.11	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluoroheptanoic acid (PFHpA)	<0.072		0.49	0.072	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluoroctanoic acid (PFOA)	<0.22		0.49	0.22	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluorononanoic acid (PFNA)	<0.089		0.49	0.089	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluorodecanoic acid (PFDA)	<0.054		0.49	0.054	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluoroundecanoic acid (PFUnA)	<0.089		0.49	0.089	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluorododecanoic acid (PFDoA)	<0.17		0.49	0.17	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluorotridecanoic acid (PFTrDA)	<0.13		0.49	0.13	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluorotetradecanoic acid (PFTeA)	<0.14		0.49	0.14	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluorobutanesulfonic acid (PFBS)	<0.062		0.49	0.062	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluorohexanesulfonic acid (PFHxS)	<0.077		0.49	0.077	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.087		0.49	0.087	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluoroctanesulfonic acid (PFOS)	<0.49		1.2	0.49	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluorodecanesulfonic acid (PFDS)	<0.097		0.49	0.097	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
Perfluoroctanesulfonamide (FOSA)	<0.21		0.49	0.21	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
NMeFOSAA	<0.97		4.9	0.97	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
NEtFOSAA	<0.92		4.9	0.92	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
6:2 FTS	<0.37		4.9	0.37	ug/Kg	05/18/21 19:53	05/27/21 13:25		1
8:2 FTS	<0.62		4.9	0.62	ug/Kg	05/18/21 19:53	05/27/21 13:25		1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	0.9	*5-	25 - 150	05/18/21 19:53	05/27/21 13:25	1
13C5 PFPeA	3	*5-	25 - 150	05/18/21 19:53	05/27/21 13:25	1
13C2 PFHxA	8	*5-	25 - 150	05/18/21 19:53	05/27/21 13:25	1
13C4 PFHpA	19	*5-	25 - 150	05/18/21 19:53	05/27/21 13:25	1
13C4 PFOA	37		25 - 150	05/18/21 19:53	05/27/21 13:25	1
13C5 PFNA	43		25 - 150	05/18/21 19:53	05/27/21 13:25	1
13C2 PFDA	38		25 - 150	05/18/21 19:53	05/27/21 13:25	1
13C2 PFUnA	24	*5-	25 - 150	05/18/21 19:53	05/27/21 13:25	1
13C2 PFDoA	10	*5-	25 - 150	05/18/21 19:53	05/27/21 13:25	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Client Sample ID: POLYMER-3-20210506

Lab Sample ID: 320-73382-12

Matrix: Liquid

Date Collected: 05/06/21 10:25
Date Received: 05/07/21 10:05

Method: 537 (modified) - Fluorinated Alkyl Substances - Post-Treatment (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFTeDA	4	*5-	25 - 150	05/18/21 19:53	05/27/21 13:25	1
13C3 PFBS	43		25 - 150	05/18/21 19:53	05/27/21 13:25	1
18O2 PFHxS	77		25 - 150	05/18/21 19:53	05/27/21 13:25	1
13C4 PFOS	73		25 - 150	05/18/21 19:53	05/27/21 13:25	1
13C8 FOSA	43		25 - 150	05/18/21 19:53	05/27/21 13:25	1
d3-NMeFOSAA	20	*5-	25 - 150	05/18/21 19:53	05/27/21 13:25	1
d5-NEtFOSAA	19	*5-	25 - 150	05/18/21 19:53	05/27/21 13:25	1
M2-6:2 FTS	31		25 - 150	05/18/21 19:53	05/27/21 13:25	1
M2-8:2 FTS	59		25 - 150	05/18/21 19:53	05/27/21 13:25	1
M2-4:2 FTS	7		0 - 10	05/18/21 19:53	05/27/21 13:25	1

Method: Total PFCA-Dif - Total PFCA (Treatment Difference)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFBA	0.00				ug/Kg			06/09/21 14:59	1
PFPA	0.00				ug/Kg			06/09/21 14:59	1
PFHxA	0.00				ug/Kg			06/09/21 14:59	1
PFHpA	0.00				ug/Kg			06/09/21 14:59	1
PFOA	0.00				ug/Kg			06/09/21 14:59	1
PFNA	0.00				ug/Kg			06/09/21 14:59	1
Total PFCA	0.00				ug/Kg			06/09/21 14:59	1

Method: Total PFCA-Sum - Total PFCA (Summary) - Pre-Treatment

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total PFCA	0.00				ug/Kg			06/09/21 14:55	1

Method: Total PFCA-Sum - Total PFCA (Summary) - Post-Treatment

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total PFCA	0.00				ug/Kg			06/09/21 14:57	1

Total Oxidation Precursors

Client: TRC Environmental Corporation.

TestAmerica Job ID: 320-73382-2

Project/Site: MMSD PFAS

Client Sample ID: POLYMER-1-20210506

Lab Sample ID: 320-73382-10

Matrix: Liquid

Analyte	Pre-Treatment Method			Post-Treatment Method			Difference ¹	
	Result	Qualifier	Unit	Result	Qualifier	Unit	Result	Unit
Perfluorobutanoic acid (PFBA)	ND		ug/Kg	0.38	J	ug/Kg	0.38	ug/Kg
Perfluoropentanoic acid (PFPeA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Perfluorohexanoic acid (PFHxA)	ND		ug/Kg	0.30	J	ug/Kg	0.30	ug/Kg
Perfluoroheptanoic acid (PFHpA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Perfluoroctanoic acid (PFOA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Perfluorononanoic acid (PFNA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Total PFCA	0.00		ug/Kg	0.68		ug/Kg	0.68	ug/Kg

Client Sample ID: POLYMER-2-20210506

Lab Sample ID: 320-73382-11

Matrix: Liquid

Analyte	Pre-Treatment Method			Post-Treatment Method			Difference ¹	
	Result	Qualifier	Unit	Result	Qualifier	Unit	Result	Unit
Perfluorobutanoic acid (PFBA)	ND		ug/Kg	8.1		ug/Kg	8.1	ug/Kg
Perfluoropentanoic acid (PFPeA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Perfluorohexanoic acid (PFHxA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Perfluoroheptanoic acid (PFHpA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Perfluoroctanoic acid (PFOA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Perfluorononanoic acid (PFNA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Total PFCA	0.00		ug/Kg	8.1		ug/Kg	8.1	ug/Kg

Client Sample ID: POLYMER-3-20210506

Lab Sample ID: 320-73382-12

Matrix: Liquid

Analyte	Pre-Treatment Method			Post-Treatment Method			Difference ¹	
	Result	Qualifier	Unit	Result	Qualifier	Unit	Result	Unit
Perfluorobutanoic acid (PFBA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Perfluoropentanoic acid (PFPeA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Perfluorohexanoic acid (PFHxA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Perfluoroheptanoic acid (PFHpA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Perfluoroctanoic acid (PFOA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Perfluorononanoic acid (PFNA)	ND		ug/Kg	ND		ug/Kg	0.00	ug/Kg
Total PFCA	0.00		ug/Kg	0.00		ug/Kg	0.00	ug/Kg

¹ Difference = Post-Treatment - Pre-Treatment

Isotope Dilution Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Liquid

Prep Type: Pre-Treatment

Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	PFBA (25-150)	PPPeA (25-150)	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
320-73382-10	POLYMER-1-20210506	0.5 *5-	1 *5-	2 *5-	4 *5-	11 *5-	18 *5-	14 *5-	8 *5-
320-73382-11	POLYMER-2-20210506	0.4 *5-	1 *5-	2 *5-	5 *5-	13 *5-	27	25	15 *5-
320-73382-12	POLYMER-3-20210506	0.4 *5-	1 *5-	2 *5-	4 *5-	11 *5-	23 *5-	21 *5-	13 *5-
LCS 320-490373/2-A	Lab Control Sample	13 *5-	75	92	96	95	89	86	92
LCSD 320-490373/3-A	Lab Control Sample Dup	15 *5-	88	95	97	98	95	87	94
MB 320-490373/1-A	Method Blank	15 *5-	82	98	109	105	100	94	100
Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	PFDoA (25-150)	PFTDA (25-150)	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)
320-73382-10	POLYMER-1-20210506	5 *5-	2 *5-	16 *5-	54	36	24 *5-	10 *5-	11 *5-
320-73382-11	POLYMER-2-20210506	7 *5-	2 *5-	14 *5-	67	63	37	16 *5-	16 *5-
320-73382-12	POLYMER-3-20210506	7 *5-	3 *5-	14 *5-	55	53	30	15 *5-	14 *5-
LCS 320-490373/2-A	Lab Control Sample	87	76	97	97	96	98	96	99
LCSD 320-490373/3-A	Lab Control Sample Dup	88	79	95	100	101	104	104	103
MB 320-490373/1-A	Method Blank	86	86	103	106	110	114	113	118
Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	M262FTS (25-150)	M282FTS (25-150)	M242FTS (25-150)					
320-73382-10	POLYMER-1-20210506	6 *5-	35	3 *5-					
320-73382-11	POLYMER-2-20210506	9 *5-	47	4 *5-					
320-73382-12	POLYMER-3-20210506	6 *5-	39	3 *5-					
LCS 320-490373/2-A	Lab Control Sample	154 *5+	104	140					
LCSD 320-490373/3-A	Lab Control Sample Dup	170 *5+	118	145					
MB 320-490373/1-A	Method Blank	196 *5+	135	159 *5+					

Surrogate Legend

PFBA = 13C4 PFBA
 PFPeA = 13C5 PFPeA
 PFHxA = 13C2 PFHxA
 C4PFHA = 13C4 PFHpA
 PFOA = 13C4 PFOA
 PFNA = 13C5 PFNA
 PFDA = 13C2 PFDA
 PFUnA = 13C2 PFUnA
 PFDoA = 13C2 PFDoA
 PFTDA = 13C2 PFTeDA
 C3PFBS = 13C3 PFBS
 PFHxS = 18O2 PFHxS
 PFOS = 13C4 PFOS
 PFOSA = 13C8 FOSA
 d3NMFOS = d3-NMeFOSAA
 d5NEFOS = d5-NEtFOSAA
 M262FTS = M2-6:2 FTS
 M282FTS = M2-8:2 FTS
 M242FTS = M2-4:2 FTS

Isotope Dilution Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Liquid

Prep Type: Post-Treatment

Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
320-73382-10	POLYMER-1-20210506	1 *5-	3 *5-	10 *5-	29	46	43	32	20 *5-
320-73382-11	POLYMER-2-20210506	0.5 *5-	3 *5-	17 *5-	41	51	47	28	15 *5-
320-73382-12	POLYMER-3-20210506	0.9 *5-	3 *5-	8 *5-	19 *5-	37	43	38	24 *5-
LCS 320-490377/2-A	Lab Control Sample	32	78	75	74	74	79	74	67
LCSD 320-490377/3-A	Lab Control Sample Dup	44	76	73	73	73	73	68	68
MB 320-490377/1-A	Method Blank	95	101	98	98	95	98	89	87
Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	PFDoA (25-150)	PFTDA (25-150)	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)
320-73382-10	POLYMER-1-20210506	11 *5-	6 *5-	66	88	67	33	19 *5-	16 *5-
320-73382-11	POLYMER-2-20210506	7 *5-	2 *5-	51	76	49	42	15 *5-	13 *5-
320-73382-12	POLYMER-3-20210506	10 *5-	4 *5-	43	77	73	43	20 *5-	19 *5-
LCS 320-490377/2-A	Lab Control Sample	62	68	83	84	84	84	85	84
LCSD 320-490377/3-A	Lab Control Sample Dup	60	64	78	79	78	79	76	80
MB 320-490377/1-A	Method Blank	87	82	104	104	100	99	98	111
Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	M262FTS (25-150)	M282FTS (25-150)	M242FTS (0-10)					
320-73382-10	POLYMER-1-20210506	53	62	5					
320-73382-11	POLYMER-2-20210506	86	64	9					
320-73382-12	POLYMER-3-20210506	31	59	7					
LCS 320-490377/2-A	Lab Control Sample	103	99	0					
LCSD 320-490377/3-A	Lab Control Sample Dup	90	95	0					
MB 320-490377/1-A	Method Blank	148	136	47 *5+					

Surrogate Legend

PFBA = 13C4 PFBA
 PFPeA = 13C5 PFPeA
 PFHxA = 13C2 PFHxA
 C4PFHA = 13C4 PFHpA
 PFOA = 13C4 PFOA
 PFNA = 13C5 PFNA
 PFDA = 13C2 PFDA
 PFUnA = 13C2 PFUnA
 PFDoA = 13C2 PFDoA
 PFTDA = 13C2 PFTeDA
 C3PFBS = 13C3 PFBS
 PFHxS = 18O2 PFHxS
 PFOS = 13C4 PFOS
 PFOSA = 13C8 FOSA
 d3NMFOS = d3-NMeFOSAA
 d5NEFOS = d5-NEtFOSAA
 M262FTS = M2-6:2 FTS
 M282FTS = M2-8:2 FTS
 M242FTS = M2-4:2 FTS

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-490373/1-A

Matrix: Liquid

Analysis Batch: 493362

Client Sample ID: Method Blank

Prep Type: Pre-Treatment

Prep Batch: 490373

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorobutanoic acid (PFBA)	<0.070		0.50	0.070	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluoropentanoic acid (PFPeA)	<0.19		0.50	0.19	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluorohexanoic acid (PFHxA)	<0.11		0.50	0.11	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluoroheptanoic acid (PFHpA)	<0.073		0.50	0.073	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluorooctanoic acid (PFOA)	<0.22		0.50	0.22	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluorononanoic acid (PFNA)	<0.090		0.50	0.090	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluorodecanoic acid (PFDA)	<0.055		0.50	0.055	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluoroundecanoic acid (PFUnA)	<0.090		0.50	0.090	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluorododecanoic acid (PFDaO)	<0.17		0.50	0.17	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluorotridecanoic acid (PFTrDA)	<0.13		0.50	0.13	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluorotetradecanoic acid (PFTeA)	<0.14		0.50	0.14	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluorobutanesulfonic acid (PFBS)	<0.063		0.50	0.063	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluorohexanesulfonic acid (PFHxS)	<0.078		0.50	0.078	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.088		0.50	0.088	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluorooctanesulfonic acid (PFOS)	<0.50		1.3	0.50	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluorodecanesulfonic acid (PFDS)	<0.098		0.50	0.098	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
Perfluorooctanesulfonamide (FOSA)	<0.21		0.50	0.21	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
NMeFOSAA	<0.98		5.0	0.98	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
NEtFOSAA	<0.93		5.0	0.93	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
6:2 FTS	<0.38		5.0	0.38	ug/Kg		05/18/21 19:45	05/27/21 10:57	1
8:2 FTS	<0.63		5.0	0.63	ug/Kg		05/18/21 19:45	05/27/21 10:57	1

Isotope Dilution	MB	MB	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac	
13C4 PFBA		15	*5-		25 - 150		05/18/21 19:45	05/27/21 10:57	1
13C5 PFPeA		82			25 - 150		05/18/21 19:45	05/27/21 10:57	1
13C2 PFHxA		98			25 - 150		05/18/21 19:45	05/27/21 10:57	1
13C4 PFHpA		109			25 - 150		05/18/21 19:45	05/27/21 10:57	1
13C4 PFOA		105			25 - 150		05/18/21 19:45	05/27/21 10:57	1
13C5 PFNA		100			25 - 150		05/18/21 19:45	05/27/21 10:57	1
13C2 PFDA		94			25 - 150		05/18/21 19:45	05/27/21 10:57	1
13C2 PFUnA		100			25 - 150		05/18/21 19:45	05/27/21 10:57	1
13C2 PFDaO		86			25 - 150		05/18/21 19:45	05/27/21 10:57	1
13C2 PFTeDA		86			25 - 150		05/18/21 19:45	05/27/21 10:57	1
13C3 PFBS		103			25 - 150		05/18/21 19:45	05/27/21 10:57	1
18O2 PFHxS		106			25 - 150		05/18/21 19:45	05/27/21 10:57	1
13C4 PFOS		110			25 - 150		05/18/21 19:45	05/27/21 10:57	1
13C8 FOSA		114			25 - 150		05/18/21 19:45	05/27/21 10:57	1
d3-NMeFOSAA		113			25 - 150		05/18/21 19:45	05/27/21 10:57	1
d5-NEtFOSAA		118			25 - 150		05/18/21 19:45	05/27/21 10:57	1
M2-6:2 FTS		196	*5+		25 - 150		05/18/21 19:45	05/27/21 10:57	1
M2-8:2 FTS		135			25 - 150		05/18/21 19:45	05/27/21 10:57	1
M2-4:2 FTS		159	*5+		25 - 150		05/18/21 19:45	05/27/21 10:57	1

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-490373/2-A

Matrix: Liquid

Analysis Batch: 493362

Client Sample ID: Lab Control Sample

Prep Type: Pre-Treatment

Prep Batch: 490373

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits
Perfluorobutanoic acid (PFBA)	5.00	5.60		ug/Kg		112	76 - 136	
Perfluoropentanoic acid (PFPeA)	5.00	5.60		ug/Kg		112	69 - 129	
Perfluorohexanoic acid (PFHxA)	5.00	5.39		ug/Kg		108	71 - 131	
Perfluoroheptanoic acid (PFHpA)	5.00	5.55		ug/Kg		111	71 - 131	
Perfluorooctanoic acid (PFOA)	5.00	5.24		ug/Kg		105	72 - 132	
Perfluorononanoic acid (PFNA)	5.00	5.53		ug/Kg		111	73 - 133	
Perfluorodecanoic acid (PFDA)	5.00	4.83		ug/Kg		97	72 - 132	
Perfluoroundecanoic acid (PFUnA)	5.00	5.26		ug/Kg		105	66 - 126	
Perfluorododecanoic acid (PFDa)	5.00	5.31		ug/Kg		106	71 - 131	
Perfluorotridecanoic acid (PFTrDA)	5.00	5.51		ug/Kg		110	71 - 131	
Perfluorotetradecanoic acid (PFTeA)	5.00	5.74		ug/Kg		115	67 - 127	
Perfluorobutanesulfonic acid (PFBS)	4.42	4.69		ug/Kg		106	69 - 129	
Perfluorohexanesulfonic acid (PFHxS)	4.55	5.07		ug/Kg		111	62 - 122	
Perfluoroheptanesulfonic Acid (PFHpS)	4.76	5.29		ug/Kg		111	76 - 136	
Perfluorooctanesulfonic acid (PFOS)	4.64	5.17		ug/Kg		111	68 - 141	
Perfluorodecanesulfonic acid (PFDS)	4.82	4.97		ug/Kg		103	71 - 131	
Perfluorooctanesulfonamide (FOSA)	5.00	5.70		ug/Kg		114	77 - 137	
NMeFOSAA	5.00	5.77		ug/Kg		115	72 - 132	
NEtFOSAA	5.00	5.60		ug/Kg		112	72 - 132	
6:2 FTS	4.74	4.89	J	ug/Kg		103	73 - 139	
8:2 FTS	4.79	5.38		ug/Kg		112	75 - 135	

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFBA	13	*5-	25 - 150
13C5 PFPeA	75		25 - 150
13C2 PFHxA	92		25 - 150
13C4 PFHpA	96		25 - 150
13C4 PFOA	95		25 - 150
13C5 PFNA	89		25 - 150
13C2 PFDA	86		25 - 150
13C2 PFUnA	92		25 - 150
13C2 PFDa	87		25 - 150
13C2 PFTeDA	76		25 - 150
13C3 PFBS	97		25 - 150
18O2 PFHxS	97		25 - 150
13C4 PFOS	96		25 - 150
13C8 FOSA	98		25 - 150
d3-NMeFOSAA	96		25 - 150
d5-NEtFOSAA	99		25 - 150
M2-6:2 FTS	154	*5+	25 - 150
M2-8:2 FTS	104		25 - 150

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QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-490373/2-A

Matrix: Liquid

Analysis Batch: 493362

<i>Isotope Dilution</i>	<i>LCS</i>	<i>LCS</i>	<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
M2-4:2 FTS	140		25 - 150

Client Sample ID: Lab Control Sample

Prep Type: Pre-Treatment

Prep Batch: 490373

Lab Sample ID: LCSD 320-490373/3-A

Matrix: Liquid

Analysis Batch: 493362

<i>Analyte</i>	<i>Spike Added</i>	<i>LCSD Result</i>	<i>LCSD Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec.</i>	<i>Limits</i>	<i>RPD</i>	<i>Limit</i>
Perfluorobutanoic acid (PFBA)	5.00	5.50		ug/Kg		110	76 - 136	2	30
Perfluoropentanoic acid (PFPeA)	5.00	5.55		ug/Kg		111	69 - 129	1	30
Perfluorohexanoic acid (PFHxA)	5.00	5.51		ug/Kg		110	71 - 131	2	30
Perfluoroheptanoic acid (PFHpA)	5.00	5.74		ug/Kg		115	71 - 131	3	30
Perfluorooctanoic acid (PFOA)	5.00	5.18		ug/Kg		104	72 - 132	1	30
Perfluorononanoic acid (PFNA)	5.00	5.67		ug/Kg		113	73 - 133	3	30
Perfluorodecanoic acid (PFDA)	5.00	5.69		ug/Kg		114	72 - 132	16	30
Perfluoroundecanoic acid (PFUnA)	5.00	5.33		ug/Kg		107	66 - 126	1	30
Perfluorododecanoic acid (PFDa)	5.00	5.14		ug/Kg		103	71 - 131	3	30
Perfluorotridecanoic acid (PFTrDA)	5.00	6.10		ug/Kg		122	71 - 131	10	30
Perfluorotetradecanoic acid (PFTeA)	5.00	5.71		ug/Kg		114	67 - 127	0	30
Perfluorobutanesulfonic acid (PFBS)	4.42	5.03		ug/Kg		114	69 - 129	7	30
Perfluorohexanesulfonic acid (PFHxS)	4.55	5.19		ug/Kg		114	62 - 122	2	30
Perfluoroheptanesulfonic Acid (PFHpS)	4.76	5.60		ug/Kg		118	76 - 136	6	30
Perfluoroctanesulfonic acid (PFOS)	4.64	5.40		ug/Kg		116	68 - 141	4	30
Perfluorodecanesulfonic acid (PFDS)	4.82	4.98		ug/Kg		103	71 - 131	0	30
Perfluorooctanesulfonamide (FOSA)	5.00	5.66		ug/Kg		113	77 - 137	1	30
NMeFOSAA	5.00	5.65		ug/Kg		113	72 - 132	2	30
NEtFOSAA	5.00	5.29		ug/Kg		106	72 - 132	6	30
6:2 FTS	4.74	5.01		ug/Kg		106	73 - 139	2	30
8:2 FTS	4.79	5.40		ug/Kg		113	75 - 135	0	30

<i>Isotope Dilution</i>	<i>LCSD</i>	<i>LCSD</i>	<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
13C4 PFBA	15	*5-	25 - 150
13C5 PFPeA	88		25 - 150
13C2 PFHxA	95		25 - 150
13C4 PFHpA	97		25 - 150
13C4 PFOA	98		25 - 150
13C5 PFNA	95		25 - 150
13C2 PFDA	87		25 - 150
13C2 PFUnA	94		25 - 150
13C2 PFDa	88		25 - 150
13C2 PFTeDA	79		25 - 150
13C3 PFBS	95		25 - 150

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QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-490373/3-A

Matrix: Liquid

Analysis Batch: 493362

Client Sample ID: Lab Control Sample Dup

Prep Type: Pre-Treatment

Prep Batch: 490373

Isotope Dilution	LCSD	LCSD	Limits
	%Recovery	Qualifier	
18O2 PFHxS	100		25 - 150
13C4 PFOS	101		25 - 150
13C8 FOSA	104		25 - 150
d3-NMeFOSAA	104		25 - 150
d5-NEtFOSAA	103		25 - 150
M2-6:2 FTS	170 *5+		25 - 150
M2-8:2 FTS	118		25 - 150
M2-4:2 FTS	145		25 - 150

Lab Sample ID: MB 320-490377/1-A

Matrix: Liquid

Analysis Batch: 493362

Client Sample ID: Method Blank

Prep Type: Post-Treatment

Prep Batch: 490377

Analyte	MB	MB	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)			0.377	J	0.50	0.070	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluoropentanoic acid (PFPeA)			<0.19		0.50	0.19	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluorohexanoic acid (PFHxA)			0.176	J I	0.50	0.11	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluoroheptanoic acid (PFHpA)			<0.073		0.50	0.073	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluorooctanoic acid (PFOA)			<0.22		0.50	0.22	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluorononanoic acid (PFNA)			<0.090		0.50	0.090	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluorodecanoic acid (PFDA)			<0.055		0.50	0.055	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluoroundecanoic acid (PFUnA)			<0.090		0.50	0.090	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluorododecanoic acid (PFDa)			<0.17		0.50	0.17	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluorotridecanoic acid (PFTrDA)			<0.13		0.50	0.13	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluorotetradecanoic acid (PFTeA)			<0.14		0.50	0.14	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluorobutanesulfonic acid (PFBS)			<0.063		0.50	0.063	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluorohexanesulfonic acid (PFHxS)			<0.078		0.50	0.078	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluoroheptanesulfonic Acid (PFHpS)			<0.088		0.50	0.088	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluorooctanesulfonic acid (PFOS)			<0.50		1.3	0.50	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluorodecanesulfonic acid (PFDS)			<0.098		0.50	0.098	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
Perfluorooctanesulfonamide (FOSA)			<0.21		0.50	0.21	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
NMeFOSAA			<0.98		5.0	0.98	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
NEtFOSAA			<0.93		5.0	0.93	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
6:2 FTS			<0.38		5.0	0.38	ug/Kg		05/18/21 19:53	05/27/21 12:39	1
8:2 FTS			<0.63		5.0	0.63	ug/Kg		05/18/21 19:53	05/27/21 12:39	1

Isotope Dilution	MB	MB	Result	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA			95		25 - 150			1
13C5 PFPeA			101		25 - 150			1
13C2 PFHxA			98		25 - 150			1
13C4 PFHpA			98		25 - 150			1
13C4 PFOA			95		25 - 150			1
13C5 PFNA			98		25 - 150			1
13C2 PFDA			89		25 - 150			1
13C2 PFUnA			87		25 - 150			1
13C2 PFDa			87		25 - 150			1
13C2 PFTeDA			82		25 - 150			1
13C3 PFBS			104		25 - 150			1

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QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-490377/1-A

Matrix: Liquid

Analysis Batch: 493362

Client Sample ID: Method Blank

Prep Type: Post-Treatment

Prep Batch: 490377

Isotope Dilution	MB	MB	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
18O2 PFHxS		104			25 - 150	05/18/21 19:53	05/27/21 12:39	1
13C4 PFOS		100			25 - 150	05/18/21 19:53	05/27/21 12:39	1
13C8 FOSA		99			25 - 150	05/18/21 19:53	05/27/21 12:39	1
d3-NMeFOSAA		98			25 - 150	05/18/21 19:53	05/27/21 12:39	1
d5-NEtFOSAA		111			25 - 150	05/18/21 19:53	05/27/21 12:39	1
M2-6:2 FTS		148			25 - 150	05/18/21 19:53	05/27/21 12:39	1
M2-8:2 FTS		136			25 - 150	05/18/21 19:53	05/27/21 12:39	1
M2-4:2 FTS		47	*5+		0 - 10	05/18/21 19:53	05/27/21 12:39	1

Lab Sample ID: LCS 320-490377/2-A

Matrix: Liquid

Analysis Batch: 493362

Client Sample ID: Lab Control Sample

Prep Type: Post-Treatment

Prep Batch: 490377

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec.	Limits
		Result	Qualifier					
Perfluorobutanoic acid (PFBA)	5.00	8.87		ug/Kg		177	96 - 183	
Perfluoropentanoic acid (PFPeA)	5.00	7.64	*+	ug/Kg		153	81 - 141	
Perfluorohexanoic acid (PFHxA)	5.00	8.30	*+	ug/Kg		166	92 - 152	
Perfluoroheptanoic acid (PFHpA)	5.00	8.01		ug/Kg		160	100 - 160	
Perfluorooctanoic acid (PFOA)	5.00	12.0		ug/Kg		241	169 - 414	
Perfluorononanoic acid (PFNA)	5.00	5.68		ug/Kg		114	82 - 142	
Perfluorodecanoic acid (PFDA)	5.00	5.39		ug/Kg		108	81 - 141	
Perfluoroundecanoic acid (PFUnA)	5.00	4.80		ug/Kg		96	70 - 130	
Perfluorododecanoic acid (PFDaA)	5.00	4.62		ug/Kg		92	63 - 123	
Perfluorotridecanoic acid (PFTrDA)	5.00	4.93		ug/Kg		99	63 - 123	
Perfluorotetradecanoic acid (PFTeA)	5.00	3.78		ug/Kg		76	55 - 115	
Perfluorobutanesulfonic acid (PFBS)	4.42	4.57		ug/Kg		103	74 - 134	
Perfluorohexanesulfonic acid (PFHxS)	4.55	4.35		ug/Kg		96	61 - 121	
Perfluoroheptanesulfonic Acid (PFHpS)	4.76	4.01		ug/Kg		84	68 - 128	
Perfluorooctanesulfonic acid (PFOS)	4.64	4.32		ug/Kg		93	70 - 138	
Perfluorodecanesulfonic acid (PFDS)	4.82	3.93		ug/Kg		81	66 - 126	
Perfluorooctanesulfonamide (FOSA)	5.00	<0.21		ug/Kg		0	0 - 10	
NMeFOSAA	5.00	<0.98		ug/Kg		0	0 - 10	
NEtFOSAA	5.00	<0.93		ug/Kg		0	0 - 10	
6:2 FTS	4.74	<0.38		ug/Kg		0	0 - 10	
8:2 FTS	4.79	<0.63		ug/Kg		0	0 - 10	

Isotope Dilution	LCS	LCS	%Recovery	Qualifier	Limits
13C4 PFBA		32			25 - 150
13C5 PFPeA		78			25 - 150
13C2 PFHxA		75			25 - 150
13C4 PFHpA		74			25 - 150

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-490377/2-A

Matrix: Liquid

Analysis Batch: 493362

Client Sample ID: Lab Control Sample

Prep Type: Post-Treatment

Prep Batch: 490377

<i>Isotope Dilution</i>	<i>LCS</i>	<i>LCS</i>	<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
13C4 PFOA	74		25 - 150
13C5 PFNA	79		25 - 150
13C2 PFDA	74		25 - 150
13C2 PFUnA	67		25 - 150
13C2 PFDoA	62		25 - 150
13C2 PFTeDA	68		25 - 150
13C3 PFBS	83		25 - 150
18O2 PFHxS	84		25 - 150
13C4 PFOS	84		25 - 150
13C8 FOSA	84		25 - 150
d3-NMeFOSAA	85		25 - 150
d5-NEtFOSAA	84		25 - 150
M2-6:2 FTS	103		25 - 150
M2-8:2 FTS	99		25 - 150
M2-4:2 FTS	0		0 - 10

Lab Sample ID: LCSD 320-490377/3-A

Matrix: Liquid

Analysis Batch: 493362

Client Sample ID: Lab Control Sample Dup

Prep Type: Post-Treatment

Prep Batch: 490377

Analyte	Spike Added	LCSD	LCSD	Unit	D	%Rec	RPD	Limit	
		Result	Qualifier						
Perfluorobutanoic acid (PFBA)	5.00	8.63		ug/Kg		173	96 - 183	3	30
Perfluoropentanoic acid (PFPeA)	5.00	7.72	*+	ug/Kg		154	81 - 141	1	30
Perfluorohexanoic acid (PFHxA)	5.00	7.72	*+	ug/Kg		154	92 - 152	7	30
Perfluoroheptanoic acid (PFHpA)	5.00	7.48		ug/Kg		150	100 - 160	7	30
Perfluorooctanoic acid (PFOA)	5.00	12.0		ug/Kg		241	169 - 414	0	30
Perfluorononanoic acid (PFNA)	5.00	5.85		ug/Kg		117	82 - 142	3	30
Perfluorodecanoic acid (PFDA)	5.00	5.92		ug/Kg		118	81 - 141	9	30
Perfluoroundecanoic acid (PFUnA)	5.00	4.98		ug/Kg		100	70 - 130	4	30
Perfluorododecanoic acid (PFDoA)	5.00	4.84		ug/Kg		97	63 - 123	5	30
Perfluorotridecanoic acid (PFTrDA)	5.00	4.97		ug/Kg		99	63 - 123	1	30
Perfluorotetradecanoic acid (PFTeA)	5.00	4.13		ug/Kg		83	55 - 115	9	30
Perfluorobutanesulfonic acid (PFBS)	4.42	4.62		ug/Kg		105	74 - 134	1	30
Perfluorohexanesulfonic acid (PFHxS)	4.55	4.64		ug/Kg		102	61 - 121	6	30
Perfluoroheptanesulfonic Acid (PFHpS)	4.76	4.36		ug/Kg		92	68 - 128	8	30
Perfluoroctanesulfonic acid (PFOS)	4.64	4.45		ug/Kg		96	70 - 138	3	30
Perfluorodecanesulfonic acid (PFDS)	4.82	4.36		ug/Kg		90	66 - 126	10	30
Perfluoroctanesulfonamide (FOSA)	5.00	<0.21		ug/Kg		0	0 - 10	NC	30
NMeFOSAA	5.00	<0.98		ug/Kg		0	0 - 10	NC	30
NEtFOSAA	5.00	<0.93		ug/Kg		0	0 - 10	NC	30
6:2 FTS	4.74	<0.38		ug/Kg		0	0 - 10	NC	30

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-490377/3-A

Client Sample ID: Lab Control Sample Dup

Matrix: Liquid

Prep Type: Post-Treatment

Analysis Batch: 493362

Prep Batch: 490377

Analyte		Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec.	RPD
8:2 FTS		4.79	<0.63		ug/Kg	0	0 - 10	NC
Isotope Dilution		LCSD %Recovery	LCSD Qualifier	Limits		0	RPD	Limit
13C4 PFBA		44		25 - 150				
13C5 PFPeA		76		25 - 150				
13C2 PFHxA		73		25 - 150				
13C4 PFHpA		73		25 - 150				
13C4 PFOA		73		25 - 150				
13C5 PFNA		73		25 - 150				
13C2 PFDA		68		25 - 150				
13C2 PFUnA		68		25 - 150				
13C2 PFDoA		60		25 - 150				
13C2 PFTeDA		64		25 - 150				
13C3 PFBS		78		25 - 150				
18O2 PFHxS		79		25 - 150				
13C4 PFOS		78		25 - 150				
13C8 FOSA		79		25 - 150				
d3-NMeFOSAA		76		25 - 150				
d5-NEtFOSAA		80		25 - 150				
M2-6:2 FTS		90		25 - 150				
M2-8:2 FTS		95		25 - 150				
M2-4:2 FTS		0		0 - 10				

QC Association Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

LCMS

Prep Batch: 490373

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-10	POLYMER-1-20210506	Pre-Treatment	Liquid	TOPS Pre Prep	
320-73382-11	POLYMER-2-20210506	Pre-Treatment	Liquid	TOPS Pre Prep	
320-73382-12	POLYMER-3-20210506	Pre-Treatment	Liquid	TOPS Pre Prep	
MB 320-490373/1-A	Method Blank	Pre-Treatment	Liquid	TOPS Pre Prep	
LCS 320-490373/2-A	Lab Control Sample	Pre-Treatment	Liquid	TOPS Pre Prep	
LCSD 320-490373/3-A	Lab Control Sample Dup	Pre-Treatment	Liquid	TOPS Pre Prep	

Prep Batch: 490377

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-10	POLYMER-1-20210506	Post-Treatment	Liquid	TOPS Post Prep	
320-73382-11	POLYMER-2-20210506	Post-Treatment	Liquid	TOPS Post Prep	
320-73382-12	POLYMER-3-20210506	Post-Treatment	Liquid	TOPS Post Prep	
MB 320-490377/1-A	Method Blank	Post-Treatment	Liquid	TOPS Post Prep	
LCS 320-490377/2-A	Lab Control Sample	Post-Treatment	Liquid	TOPS Post Prep	
LCSD 320-490377/3-A	Lab Control Sample Dup	Post-Treatment	Liquid	TOPS Post Prep	

Analysis Batch: 493362

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-10	POLYMER-1-20210506	Post-Treatment	Liquid	537 (modified)	490377
320-73382-10	POLYMER-1-20210506	Pre-Treatment	Liquid	537 (modified)	490373
320-73382-11	POLYMER-2-20210506	Post-Treatment	Liquid	537 (modified)	490377
320-73382-11	POLYMER-2-20210506	Pre-Treatment	Liquid	537 (modified)	490373
320-73382-12	POLYMER-3-20210506	Post-Treatment	Liquid	537 (modified)	490377
320-73382-12	POLYMER-3-20210506	Pre-Treatment	Liquid	537 (modified)	490373
MB 320-490373/1-A	Method Blank	Pre-Treatment	Liquid	537 (modified)	490373
MB 320-490377/1-A	Method Blank	Post-Treatment	Liquid	537 (modified)	490377
LCS 320-490373/2-A	Lab Control Sample	Pre-Treatment	Liquid	537 (modified)	490373
LCS 320-490377/2-A	Lab Control Sample	Post-Treatment	Liquid	537 (modified)	490377
LCSD 320-490373/3-A	Lab Control Sample Dup	Pre-Treatment	Liquid	537 (modified)	490373
LCSD 320-490377/3-A	Lab Control Sample Dup	Post-Treatment	Liquid	537 (modified)	490377

Analysis Batch: 497119

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-10	POLYMER-1-20210506	Pre-Treatment	Liquid	Total PFCA-Sum	
320-73382-11	POLYMER-2-20210506	Pre-Treatment	Liquid	Total PFCA-Sum	
320-73382-12	POLYMER-3-20210506	Pre-Treatment	Liquid	Total PFCA-Sum	

Analysis Batch: 497120

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-10	POLYMER-1-20210506	Post-Treatment	Liquid	Total PFCA-Sum	
320-73382-11	POLYMER-2-20210506	Post-Treatment	Liquid	Total PFCA-Sum	
320-73382-12	POLYMER-3-20210506	Post-Treatment	Liquid	Total PFCA-Sum	

Analysis Batch: 497121

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73382-10	POLYMER-1-20210506	Total/NA	Liquid	Total PFCA-Dif	
320-73382-11	POLYMER-2-20210506	Total/NA	Liquid	Total PFCA-Dif	
320-73382-12	POLYMER-3-20210506	Total/NA	Liquid	Total PFCA-Dif	

Lab Chronicle

Client: TRC Environmental Corporation.

Project/Site: MMSD PFAS

Job ID: 320-73382-2

Client Sample ID: POLYMER-1-20210506

Date Collected: 05/06/21 10:40

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-10

Matrix: Liquid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Post-Treatment	Prep	TOPS Post Prep			2.02 mL	10.00 mL	490377	05/18/21 19:53	JER	TAL SAC
Post-Treatment	Analysis	537 (modified)		1			493362	05/27/21 13:06	JY1	TAL SAC
Pre-Treatment	Prep	TOPS Pre Prep			2.04 mL	10.00 mL	490373	05/18/21 19:45	JER	TAL SAC
Pre-Treatment	Analysis	537 (modified)		1			493362	05/27/21 11:24	JY1	TAL SAC
Total/NA	Analysis	Total PFCA-Dif		1			497121	06/09/21 14:59	MKW	TAL SAC
Post-Treatment	Analysis	Total PFCA-Sum		1			497120	06/09/21 14:57	MKW	TAL SAC
Pre-Treatment	Analysis	Total PFCA-Sum		1			497119	06/09/21 14:55	MKW	TAL SAC

Client Sample ID: POLYMER-2-20210506

Date Collected: 05/06/21 09:50

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-11

Matrix: Liquid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Post-Treatment	Prep	TOPS Post Prep			2.01 mL	10.00 mL	490377	05/18/21 19:53	JER	TAL SAC
Post-Treatment	Analysis	537 (modified)		1			493362	05/27/21 13:15	JY1	TAL SAC
Pre-Treatment	Prep	TOPS Pre Prep			2.03 mL	10.00 mL	490373	05/18/21 19:45	JER	TAL SAC
Pre-Treatment	Analysis	537 (modified)		1			493362	05/27/21 11:34	JY1	TAL SAC
Total/NA	Analysis	Total PFCA-Dif		1			497121	06/09/21 14:59	MKW	TAL SAC
Post-Treatment	Analysis	Total PFCA-Sum		1			497120	06/09/21 14:57	MKW	TAL SAC
Pre-Treatment	Analysis	Total PFCA-Sum		1			497119	06/09/21 14:55	MKW	TAL SAC

Client Sample ID: POLYMER-3-20210506

Date Collected: 05/06/21 10:25

Date Received: 05/07/21 10:05

Lab Sample ID: 320-73382-12

Matrix: Liquid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Post-Treatment	Prep	TOPS Post Prep			2.03 mL	10.00 mL	490377	05/18/21 19:53	JER	TAL SAC
Post-Treatment	Analysis	537 (modified)		1			493362	05/27/21 13:25	JY1	TAL SAC
Pre-Treatment	Prep	TOPS Pre Prep			2.01 mL	10.00 mL	490373	05/18/21 19:45	JER	TAL SAC
Pre-Treatment	Analysis	537 (modified)		1			493362	05/27/21 11:43	JY1	TAL SAC
Total/NA	Analysis	Total PFCA-Dif		1			497121	06/09/21 14:59	MKW	TAL SAC
Post-Treatment	Analysis	Total PFCA-Sum		1			497120	06/09/21 14:57	MKW	TAL SAC
Pre-Treatment	Analysis	Total PFCA-Sum		1			497119	06/09/21 14:55	MKW	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Eurofins TestAmerica, Sacramento

Accreditation/Certification Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	02-20-24
ANAB	Dept. of Defense ELAP	L2468	01-20-24
ANAB	Dept. of Energy	L2468.01	01-20-24
ANAB	ISO/IEC 17025	L2468	01-20-24
Arizona	State	AZ0708	08-11-21
Arkansas DEQ	State	88-0691	06-17-21
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-21
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-21
Georgia	State	4040	01-29-22
Hawaii	State	<cert No.>	01-29-22
Illinois	NELAP	200060	03-18-22
Kansas	NELAP	E-10375	10-31-21
Louisiana	NELAP	01944	06-30-21
Maine	State	CA00004	04-14-22
Michigan	State	9947	01-29-22
Nevada	State	CA000442021-2	07-31-21
New Hampshire	NELAP	2997	04-18-22
New Jersey	NELAP	CA005	06-30-21
New York	NELAP	11666	04-01-22
Ohio	State	41252	01-29-22
Oregon	NELAP	4040	01-30-23
Texas	NELAP	T104704399-19-13	05-31-22
US Fish & Wildlife	US Federal Programs	58448	07-31-21
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442021-12	03-01-22
Virginia	NELAP	460278	03-14-22
Washington	State	C581	05-05-22
West Virginia (DW)	State	9930C	12-31-21
Wisconsin	State	998204680	08-31-21
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins TestAmerica, Sacramento

Method Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
Total PFCA-Dif	Total PFCA (Treatment Difference)	TAL SOP	TAL SAC
Total PFCA-Sum	Total PFCA (Summary)	TAL SOP	TAL SAC
TOPS Post Prep	Solid-Phase Extraction (SPE)	SW846	TAL SAC
TOPS Pre Prep	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

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Sample Summary

Client: TRC Environmental Corporation.
Project/Site: MMSD PFAS

Job ID: 320-73382-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-73382-10	POLYMER-1-20210506	Liquid	05/06/21 10:40	05/07/21 10:05	
320-73382-11	POLYMER-2-20210506	Liquid	05/06/21 09:50	05/07/21 10:05	
320-73382-12	POLYMER-3-20210506	Liquid	05/06/21 10:25	05/07/21 10:05	

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Chain of Custody Record

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TestAmerica

Address: _____

Regulatory Program: <input type="checkbox"/> DW <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> Other:										COC No.: <u>1</u> of <u>2</u> COCs		
Client Contact		Project Manager: Mike Ursin Tel/Email: Murzin@trccompanics.com		Site Contact: Altucker		Date: 5/6/2021		Carrier:		COC No.: <u>1</u> of <u>2</u> COCs		
Company Name: TRC Address: 708 Heartland Trail, Suite 3000 City/State/Zip: Madison, WI 53717 Phone: (605) 275-6478 Fax: _____ Project Name: MMSD PFAS Site: MMSD PO#		Analysis Turnaround Time <input checked="" type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day								Sampler: Lydia Auner For Lab Use Only: Walk-in Client: Lab Sampling: Job/SDG No.: _____		
TOP ASSAY PFAS LI 33 List Perform MS/MS (Y/N) Preferred Sample (Y/N)												
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sample Specific Notes:		320-73382 Chain of Custody			
INFLUENT-02 - 20210506	5/6/21	8:25	C	WW	3	N N X X						
INFLUENT - 07 - 20210506	5/6/21	8:35	C	WW	3	N N X X						
INFLUENT - 08 - 20210506	5/6/21	8:43	C	WW	3	N N X X						
INFLUENT - 11 - 20210506	5/6/21	8:47	C	WW	3	N N X X						
INFLUENT - 18 - 20210506	5/6/21	8:53	C	WW	3	N N X X						
EFFLUENT - PERM - 20210506	5/6/21	9:00	C	WW	3	N N X X						
BIOsolids-A - 20210506	5/6/21	9:31	C	S	2	N N X X						
BIOsolids-B - 20210506	5/6/21	10:55	C	S	2	N N X X						
STRUvITE - 20210506	5/6/21	10:10	G	S	1	N N X X						
POLyMER - 1 - 20210506	5/6/21	10:40	G	S	1	N N X X						
POLyMER - 2 - 20210506	5/6/21	9:50	G	S	1	N N X X						
POLyMER - 3 - 20210506	5/6/21	10:25	G	S	1	N N X X						
Preservation Used: 1=Ice, 2=HCl; 3=H2SO4; 4=HNO3; 5=NaOH; 6=Other												
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.												
<input type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input type="checkbox"/> Unknown			<input type="checkbox"/> Return to Client	<input type="checkbox"/> Disposal by Lab	<input type="checkbox"/> Archive for _____ Months			
Special Instructions/QC Requirements & Comments: 2.0 3.1 2.0												
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.: <u>143480011490745</u>		Cooler Temp. (°C): Obsd: <u>1.0</u> Corrd: <u>1.0</u>		Therm ID No.: <u>10</u>		Company: <u>TRC</u>		Date/Time: <u>5/6/21 16:00</u>		
Relinquished by: <u>Jyden Juhn</u>				Received by: <u>SP</u>				Company: <u>Eurofins</u>		Date/Time: <u>5/7/21 10:05</u>		
Relinquished by: _____				Received by: <u>J</u>				Company: _____		Date/Time: _____		
Relinquished by: _____				Received in Laboratory by: _____				Company: _____		Date/Time: _____		

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Chain of Custody Record

eurofins

413253

Chain of Custody Record

Environment Testing
TestAmerica

Address: _____

Regulatory Program: DW NPDES RCRA Other:

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7/6/2021 (Rev. 2)

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 320-73382-2

Login Number: 73382

List Source: Eurofins TestAmerica, Sacramento

List Number: 1

Creator: Oropeza, Salvador

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	1602174/1490745/1474806
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Environment Testing
America



ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-76567-1
Client Project/Site: PFAS Phase 1
Revision: 1

For:
Madison Metropolitan Sewerage District
1610 Moorland Road
Madison, Wisconsin 53713-3398

Attn: Carol Mielke

Authorized for release by:
7/29/2021 1:26:53 PM

David Alltucker, Project Manager I
(916)374-4383
David.Alltucker@Eurofinset.com

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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Qualifiers

LCMS	Qualifier Description
Qualifier	
*5+	Isotope dilution analyte is outside acceptance limits, high biased.
F1	MS and/or MSD recovery exceeds control limits.
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Job ID: 320-76567-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative 320-76567-1

Revision 7-29-2021: This report has been revised to correct reporting ND as <MDL

Receipt

The samples were received on 7/22/2021 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.8° C.

Receipt Exceptions

The following samples were received at the laboratory without a sample collection time documented on the chain of custody or samples Class B Biosolids (320-76567-1) and Class B Biosolids Dup (320-76567-2).

LCMS

Method 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for the following samples: Class B Biosolids (320-76567-1), Class B Biosolids Dup (320-76567-2), (320-76567-A-1-B MS) and (320-76567-A-1-C MSD). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was outside of the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty, and the reported value may have some high bias. However, analyst judgment was used to positively identify the analyte. Class B Biosolids (320-76567-1), Class B Biosolids Dup (320-76567-2), (320-76567-A-1-B MS) and (320-76567-A-1-C MSD)

Method 537 (modified): The matrix spike duplicate (MSD) recoveries for Perfluorotridecanoic acid (PFTrDA) preparation batch 320-510168 and analytical batch 320-510640 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 537 (modified): The matrix spike (MS) recoveries for several analytes in preparation batch 320-510168 and analytical batch 320-510640 were outside control limits. Sample matrix interference is suspected.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

Method SHAKE: The following samples were light yellow after extraction: Class B Biosolids (320-76567-1), Class B Biosolids Dup (320-76567-2), (320-76567-A-1 MS) and (320-76567-A-1 MSD).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Client Sample ID: Class B Biosolids

Lab Sample ID: 320-76567-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	3.2	I	3.2	0.50	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.2	J	3.2	0.85	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.60	J	3.2	0.35	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	4.9		3.2	0.77	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.2	J	3.2	0.68	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDa)	2.6	J	3.2	0.48	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.0	J	3.2	0.60	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.0	J	3.2	0.47	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	8.0	I	3.2	0.69	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorodecanesulfonic acid (PFDS)	2.4	J	3.2	0.84	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorooctanesulfonamide (FOSA)	1.0	J	3.2	0.53	ug/Kg	1	⊗	537 (modified)	Total/NA
NMeFOSAA	13		3.2	0.37	ug/Kg	1	⊗	537 (modified)	Total/NA
NEtFOSAA	7.9		3.2	0.77	ug/Kg	1	⊗	537 (modified)	Total/NA
NMeFOSE	11		3.2	0.76	ug/Kg	1	⊗	537 (modified)	Total/NA
NEtFOSE	3.1	J	3.2	0.45	ug/Kg	1	⊗	537 (modified)	Total/NA
8:2 FTS	0.60	J	3.2	0.56	ug/Kg	1	⊗	537 (modified)	Total/NA

Client Sample ID: Class B Biosolids Dup

Lab Sample ID: 320-76567-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	3.8	I	3.8	0.59	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.6	J	3.8	1.0	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.65	J	3.8	0.42	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	5.7		3.8	0.92	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.2	J	3.8	0.80	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDa)	3.0	J	3.8	0.57	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.85	J	3.8	0.71	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.4	J	3.8	0.56	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	10	I	3.8	0.82	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorodecanesulfonic acid (PFDS)	2.0	J	3.8	1.0	ug/Kg	1	⊗	537 (modified)	Total/NA
Perfluorooctanesulfonamide (FOSA)	1.2	J	3.8	0.63	ug/Kg	1	⊗	537 (modified)	Total/NA
NMeFOSAA	16		3.8	0.44	ug/Kg	1	⊗	537 (modified)	Total/NA
NEtFOSAA	9.1		3.8	0.92	ug/Kg	1	⊗	537 (modified)	Total/NA
NMeFOSE	12		3.8	0.90	ug/Kg	1	⊗	537 (modified)	Total/NA
NEtFOSE	5.7		3.8	0.54	ug/Kg	1	⊗	537 (modified)	Total/NA
8:2 FTS	0.67	J	3.8	0.67	ug/Kg	1	⊗	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Client Sample ID: Class B Biosolids

Date Collected: 07/19/21 00:00

Date Received: 07/22/21 09:40

Lab Sample ID: 320-76567-1

Matrix: Solid

Percent Solids: 6.1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.74		3.2	0.74	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluoropentanoic acid (PFPeA)	<0.66		3.2	0.66	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorohexanoic acid (PFHxA)	3.2 I		3.2	0.50	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluoroheptanoic acid (PFHpA)	<0.61		3.2	0.61	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorooctanoic acid (PFOA)	1.2 J		3.2	0.85	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorononanoic acid (PFNA)	0.60 J		3.2	0.35	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorodecanoic acid (PFDA)	4.9		3.2	0.77	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluoroundecanoic acid (PFUnA)	1.2 J		3.2	0.68	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorododecanoic acid (PFDoA)	2.6 J		3.2	0.48	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorotridecanoic acid (PFTrDA)	<0.34 F1		3.2	0.34	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorotetradecanoic acid (PFTeA)	1.0 J		3.2	0.60	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorobutanesulfonic acid (PFBS)	<0.61		3.2	0.61	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluoropentanesulfonic acid (PFPeS)	<0.60		3.2	0.60	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorohexanesulfonic acid (PFHxS)	2.0 J		3.2	0.47	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluoroheptanesulfonic Acid (PFHsP)	<0.79		3.2	0.79	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorooctanesulfonic acid (PFOS)	8.0 I		3.2	0.69	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorononanesulfonic acid (PFNS)	<0.47		3.2	0.47	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorodecanesulfonic acid (PFDS)	2.4 J		3.2	0.84	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorododecanesulfonic acid (PFDoS)	<0.76 F1		3.2	0.76	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
Perfluorooctanesulfonamide (FOSA)	1.0 J		3.2	0.53	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
N<i>Et</i>FOSA	<0.76		3.2	0.76	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
N<i>Me</i>FOSA	<0.79		3.2	0.79	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
N<i>Me</i>FOSAA	13		3.2	0.37	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
N<i>Et</i>FOSAA	7.9		3.2	0.77	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
N<i>Me</i>FOSE	11		3.2	0.76	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
N<i>Et</i>FOSE	3.1 J		3.2	0.45	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
4:2 FTS	<0.82		3.2	0.82	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
6:2 FTS	<0.43		3.2	0.43	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
8:2 FTS	0.60 J		3.2	0.56	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.63		3.2	0.63	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
HFPO-DA (GenX)	<0.66		3.2	0.66	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
9Cl-PF3ONS	<0.56 F1		3.2	0.56	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1
11Cl-PF3OUdS	<0.50		3.2	0.50	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:20	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	71		25 - 150	07/26/21 04:44	07/27/21 15:20	1
13C5 PFPeA	81		25 - 150	07/26/21 04:44	07/27/21 15:20	1
13C2 PFHxA	85		25 - 150	07/26/21 04:44	07/27/21 15:20	1
13C4 PFHpA	87		25 - 150	07/26/21 04:44	07/27/21 15:20	1
13C4 PFOA	82		25 - 150	07/26/21 04:44	07/27/21 15:20	1
13C5 PFNA	86		25 - 150	07/26/21 04:44	07/27/21 15:20	1
13C2 PFDA	84		25 - 150	07/26/21 04:44	07/27/21 15:20	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Client Sample ID: Class B Biosolids

Date Collected: 07/19/21 00:00
Date Received: 07/22/21 09:40

Lab Sample ID: 320-76567-1

Matrix: Solid

Percent Solids: 6.1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	57		25 - 150	07/26/21 04:44	07/27/21 15:20	1
13C2 PFDaA	35		25 - 150	07/26/21 04:44	07/27/21 15:20	1
13C2 PFTeDA	27		25 - 150	07/26/21 04:44	07/27/21 15:20	1
13C3 PFBS	85		25 - 150	07/26/21 04:44	07/27/21 15:20	1
18O2 PFHxS	92		25 - 150	07/26/21 04:44	07/27/21 15:20	1
13C4 PFOS	95		25 - 150	07/26/21 04:44	07/27/21 15:20	1
13C8 FOSA	83		10 - 150	07/26/21 04:44	07/27/21 15:20	1
d3-NMeFOSAA	71		25 - 150	07/26/21 04:44	07/27/21 15:20	1
d5-NEtFOSAA	42		25 - 150	07/26/21 04:44	07/27/21 15:20	1
d-N-MeFOSA-M	60		10 - 150	07/26/21 04:44	07/27/21 15:20	1
d-N-EtFOSA-M	35		10 - 150	07/26/21 04:44	07/27/21 15:20	1
d7-N-MeFOSE-M	49		10 - 150	07/26/21 04:44	07/27/21 15:20	1
d9-N-EtFOSE-M	33		10 - 150	07/26/21 04:44	07/27/21 15:20	1
M2-4:2 FTS	153 *5+		25 - 150	07/26/21 04:44	07/27/21 15:20	1
M2-6:2 FTS	171 *5+		25 - 150	07/26/21 04:44	07/27/21 15:20	1
M2-8:2 FTS	190 *5+		25 - 150	07/26/21 04:44	07/27/21 15:20	1
13C3 HFPO-DA	87		25 - 150	07/26/21 04:44	07/27/21 15:20	1
13C2 10:2 FTS	64		25 - 150	07/26/21 04:44	07/27/21 15:20	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	93.9		0.1	0.1	%			07/23/21 10:03	1
Percent Solids	6.1		0.1	0.1	%			07/23/21 10:03	1

Client Sample ID: Class B Biosolids Dup

Date Collected: 07/19/21 00:00
Date Received: 07/22/21 09:40

Lab Sample ID: 320-76567-2

Matrix: Solid

Percent Solids: 5.1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.88		3.8	0.88	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluoropentanoic acid (PFPeA)	<0.79		3.8	0.79	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluorohexanoic acid (PFHxA)	3.8 I		3.8	0.59	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluoroheptanoic acid (PFHpA)	<0.73		3.8	0.73	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluorooctanoic acid (PFOA)	1.6 J		3.8	1.0	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluorononanoic acid (PFNA)	0.65 J		3.8	0.42	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluorodecanoic acid (PFDA)	5.7		3.8	0.92	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluoroundecanoic acid (PFUnA)	1.2 J		3.8	0.80	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluorododecanoic acid (PFDaA)	3.0 J		3.8	0.57	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluorotridecanoic acid (PFTrDA)	<0.40		3.8	0.40	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluorotetradecanoic acid (PFTeA)	0.85 J		3.8	0.71	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluorobutanesulfonic acid (PFBS)	<0.73		3.8	0.73	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluoropentanesulfonic acid (PFPeS)	<0.71		3.8	0.71	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluorohexanesulfonic acid (PFHxS)	2.4 J		3.8	0.56	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.94		3.8	0.94	ug/Kg	✉	07/26/21 04:44	07/27/21 15:47	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Client Sample ID: Class B Biosolids Dup

Date Collected: 07/19/21 00:00
Date Received: 07/22/21 09:40

Lab Sample ID: 320-76567-2

Matrix: Solid

Percent Solids: 5.1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroctanesulfonic acid (PFOS)	10	I	3.8	0.82	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
Perfluorononanesulfonic acid (PFNS)	<0.56		3.8	0.56	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
Perfluorodecanesulfonic acid (PFDS)	2.0	J	3.8	1.0	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
Perfluorododecanesulfonic acid (PFDoS)	<0.90		3.8	0.90	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
Perfluoroctanesulfonamide (FOSA)	1.2	J	3.8	0.63	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
NEtFOSA	<0.90		3.8	0.90	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
NMeFOSA	<0.94		3.8	0.94	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
NMeFOSAA	16		3.8	0.44	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
NEtFOSAA	9.1		3.8	0.92	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
NMeFOSE	12		3.8	0.90	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
NEtFOSE	5.7		3.8	0.54	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
4:2 FTS	<0.98		3.8	0.98	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
6:2 FTS	<0.52		3.8	0.52	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
8:2 FTS	0.67	J	3.8	0.67	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.75		3.8	0.75	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
HFPO-DA (GenX)	<0.79		3.8	0.79	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
9Cl-PF3ONS	<0.67		3.8	0.67	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
11Cl-PF3OUds	<0.59		3.8	0.59	ug/Kg	⌚	07/26/21 04:44	07/27/21 15:47	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	68		25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C5 PFPeA	77		25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C2 PFHxA	78		25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C4 PFHpA	81		25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C4 PFOA	80		25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C5 PFNA	84		25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C2 PFDA	83		25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C2 PFUnA	64		25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C2 PFDa	33		25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C2 PFTeDA	28		25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C3 PFBS	78		25 - 150				07/26/21 04:44	07/27/21 15:47	1
18O2 PFHxS	83		25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C4 PFOS	87		25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C8 FOSA	78		10 - 150				07/26/21 04:44	07/27/21 15:47	1
d3-NMeFOSAA	61		25 - 150				07/26/21 04:44	07/27/21 15:47	1
d5-NEtFOSAA	40		25 - 150				07/26/21 04:44	07/27/21 15:47	1
d-N-MeFOSA-M	59		10 - 150				07/26/21 04:44	07/27/21 15:47	1
d-N-EtFOSA-M	34		10 - 150				07/26/21 04:44	07/27/21 15:47	1
d7-N-MeFOSE-M	50		10 - 150				07/26/21 04:44	07/27/21 15:47	1
d9-N-EtFOSE-M	32		10 - 150				07/26/21 04:44	07/27/21 15:47	1
M2-4:2 FTS	144		25 - 150				07/26/21 04:44	07/27/21 15:47	1
M2-6:2 FTS	165	*5+	25 - 150				07/26/21 04:44	07/27/21 15:47	1
M2-8:2 FTS	179	*5+	25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C3 HFPO-DA	80		25 - 150				07/26/21 04:44	07/27/21 15:47	1
13C2 10:2 FTS	60		25 - 150				07/26/21 04:44	07/27/21 15:47	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Client Sample ID: Class B Biosolids Dup
Date Collected: 07/19/21 00:00
Date Received: 07/22/21 09:40

Lab Sample ID: 320-76567-2
Matrix: Solid
Percent Solids: 5.1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	94.9		0.1	0.1	%			07/23/21 10:03	1
Percent Solids	5.1		0.1	0.1	%			07/23/21 10:03	1

Isotope Dilution Summary

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Solid

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	PFBA (25-150)	PPPeA (25-150)	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
320-76567-1	Class B Biosolids	71	81	85	87	82	86	84	57
320-76567-1 MS	Class B Biosolids	70	80	84	88	84	87	81	71
320-76567-1 MSD	Class B Biosolids	68	77	79	82	76	78	79	63
320-76567-2	Class B Biosolids Dup	68	77	78	81	80	84	83	64
LCS 320-510168/2-A	Lab Control Sample	76	85	82	84	87	88	90	88
MB 320-510168/1-A	Method Blank	80	83	86	86	86	87	88	89
Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	PFDoA (25-150)	PFTDA (25-150)	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (10-150)	d3NMFOS (25-150)	d5NEFOS (25-150)
320-76567-1	Class B Biosolids	35	27	85	92	95	83	71	42
320-76567-1 MS	Class B Biosolids	35	30	85	87	93	80	67	42
320-76567-1 MSD	Class B Biosolids	29	27	78	86	82	79	62	38
320-76567-2	Class B Biosolids Dup	33	28	78	83	87	78	61	40
LCS 320-510168/2-A	Lab Control Sample	88	82	81	88	91	91	89	87
MB 320-510168/1-A	Method Blank	87	90	84	88	94	94	87	89
Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	dMeFOSA (10-150)	dEtFOSA (10-150)	NMFM (10-150)	NEFM (10-150)	M242FTS (25-150)	M262FTS (25-150)	M282FTS (25-150)	HFPODA (25-150)
320-76567-1	Class B Biosolids	60	35	49	33	153 *5+	171 *5+	190 *5+	87
320-76567-1 MS	Class B Biosolids	56	36	53	31	139	170 *5+	190 *5+	82
320-76567-1 MSD	Class B Biosolids	58	33	46	29	134	162 *5+	178 *5+	82
320-76567-2	Class B Biosolids Dup	59	34	50	32	144	165 *5+	179 *5+	80
LCS 320-510168/2-A	Lab Control Sample	85	93	68	71	110	108	98	84
MB 320-510168/1-A	Method Blank	85	90	62	62	111	114	109	85
Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	M102FTS							
Lab Sample ID	Client Sample ID	(25-150)							
320-76567-1	Class B Biosolids	64							
320-76567-1 MS	Class B Biosolids	62							
320-76567-1 MSD	Class B Biosolids	65							
320-76567-2	Class B Biosolids Dup	60							
LCS 320-510168/2-A	Lab Control Sample	84							
MB 320-510168/1-A	Method Blank	89							

Surrogate Legend

PFBA = 13C4 PFBA
 PPpEA = 13C5 PPpEA
 PFHxA = 13C2 PFHxA
 C4PFHA = 13C4 PFHpA
 PFOA = 13C4 PFOA
 PFNA = 13C5 PFNA
 PFDA = 13C2 PFDA
 PFUnA = 13C2 PFUnA
 PFDoA = 13C2 PFDoA
 PFTDA = 13C2 PFTDA
 C3PFBS = 13C3 PFBS
 PFHxS = 18O2 PFHxS
 PFOS = 13C4 PFOS
 PFOSA = 13C8 FOSA

Isotope Dilution Summary

Client: Madison Metropolitan Sewerage District

Project/Site: PFAS Phase 1

Job ID: 320-76567-1

d3NMFOS = d3-NMeFOSAA

d5NEFOS = d5-NEtFOSAA

dMeFOSA = d-N-MeFOSA-M

dEtFOSA = d-N-EtFOSA-M

NMFM = d7-N-MeFOSE-M

NEFM = d9-N-EtFOSE-M

M242FTS = M2-4:2 FTS

M262FTS = M2-6:2 FTS

M282FTS = M2-8:2 FTS

HFPODA = 13C3 HFPO-DA

M102FTS = 13C2 10:2 FTS

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QC Sample Results

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-510168/1-A

Matrix: Solid

Analysis Batch: 510425

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 510168

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.046		0.20	0.046	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluoropentanoic acid (PFPeA)	<0.041		0.20	0.041	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluorohexanoic acid (PFHxA)	<0.031		0.20	0.031	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluoroheptanoic acid (PFHpA)	<0.038		0.20	0.038	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluorooctanoic acid (PFOA)	<0.053		0.20	0.053	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluorononanoic acid (PFNA)	<0.022		0.20	0.022	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluorodecanoic acid (PFDA)	<0.048		0.20	0.048	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluoroundecanoic acid (PFUnA)	<0.042		0.20	0.042	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluorododecanoic acid (PFDoA)	<0.030		0.20	0.030	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluorotridecanoic acid (PFTrDA)	<0.021		0.20	0.021	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluorotetradecanoic acid (PFTeA)	<0.037		0.20	0.037	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluorobutanesulfonic acid (PFBS)	<0.038		0.20	0.038	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluoropentanesulfonic acid (PFPeS)	<0.037		0.20	0.037	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluorohexanesulfonic acid (PFHxS)	<0.029		0.20	0.029	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.049		0.20	0.049	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluorooctanesulfonic acid (PFOS)	<0.043		0.20	0.043	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluoronananesulfonic acid (PFNS)	<0.029		0.20	0.029	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluorodecanesulfonic acid (PFDS)	<0.052		0.20	0.052	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluorododecanesulfonic acid (PFDoS)	<0.047		0.20	0.047	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
Perfluorooctanesulfonamide (FOSA)	<0.033		0.20	0.033	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
NEtFOSA	<0.047		0.20	0.047	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
NMeFOSA	<0.049		0.20	0.049	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
NMeFOSAA	<0.023		0.20	0.023	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
NETFOSAA	<0.048		0.20	0.048	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
NMeFOSE	<0.047		0.20	0.047	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
NEtFOSE	<0.028		0.20	0.028	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
4:2 FTS	<0.051		0.20	0.051	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
6:2 FTS	<0.027		0.20	0.027	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
8:2 FTS	<0.035		0.20	0.035	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.039		0.20	0.039	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
HFPO-DA (GenX)	<0.041		0.20	0.041	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
9CI-PF3ONS	<0.035		0.20	0.035	ug/Kg		07/26/21 04:44	07/27/21 04:09	1
11CI-PF3OUds	<0.031		0.20	0.031	ug/Kg		07/26/21 04:44	07/27/21 04:09	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	80		25 - 150		07/26/21 04:44	07/27/21 04:09
13C5 PFPeA	83		25 - 150		07/26/21 04:44	07/27/21 04:09
13C2 PFHxA	86		25 - 150		07/26/21 04:44	07/27/21 04:09
13C4 PFHpA	86		25 - 150		07/26/21 04:44	07/27/21 04:09
13C4 PFOA	86		25 - 150		07/26/21 04:44	07/27/21 04:09
13C5 PFNA	87		25 - 150		07/26/21 04:44	07/27/21 04:09
13C2 PFDA	88		25 - 150		07/26/21 04:44	07/27/21 04:09
13C2 PFUnA	89		25 - 150		07/26/21 04:44	07/27/21 04:09
13C2 PFDoA	87		25 - 150		07/26/21 04:44	07/27/21 04:09
13C2 PFTeDA	90		25 - 150		07/26/21 04:44	07/27/21 04:09

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-510168/1-A

Matrix: Solid

Analysis Batch: 510425

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 510168

Isotope Dilution	MB	MB	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier			
13C3 PFBS	84		25 - 150	07/26/21 04:44	07/27/21 04:09
18O2 PFHxS	88		25 - 150	07/26/21 04:44	07/27/21 04:09
13C4 PFOS	94		25 - 150	07/26/21 04:44	07/27/21 04:09
13C8 FOSA	94		10 - 150	07/26/21 04:44	07/27/21 04:09
d3-NMeFOSAA	87		25 - 150	07/26/21 04:44	07/27/21 04:09
d5-NEtFOSAA	89		25 - 150	07/26/21 04:44	07/27/21 04:09
d-N-MeFOSA-M	85		10 - 150	07/26/21 04:44	07/27/21 04:09
d-N-EtFOSA-M	90		10 - 150	07/26/21 04:44	07/27/21 04:09
d7-N-MeFOSE-M	62		10 - 150	07/26/21 04:44	07/27/21 04:09
d9-N-EtFOSE-M	62		10 - 150	07/26/21 04:44	07/27/21 04:09
M2-4:2 FTS	111		25 - 150	07/26/21 04:44	07/27/21 04:09
M2-6:2 FTS	114		25 - 150	07/26/21 04:44	07/27/21 04:09
M2-8:2 FTS	109		25 - 150	07/26/21 04:44	07/27/21 04:09
13C3 HFPO-DA	85		25 - 150	07/26/21 04:44	07/27/21 04:09
13C2 10:2 FTS	89		25 - 150	07/26/21 04:44	07/27/21 04:09

Lab Sample ID: LCS 320-510168/2-A

Matrix: Solid

Analysis Batch: 510425

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 510168

Analyte	Spike	LCS	LCS	Unit	D	%Rec	Limts	%Rec.
	Added	Result	Qualifier					
Perfluorobutanoic acid (PFBA)	2.00	2.00		ug/Kg		100	60 - 135	
Perfluoropentanoic acid (PFPeA)	2.00	2.04		ug/Kg		102	60 - 135	
Perfluorohexanoic acid (PFHxA)	2.00	2.03		ug/Kg		101	60 - 135	
Perfluoroheptanoic acid (PFHpA)	2.00	2.21		ug/Kg		110	60 - 135	
Perfluorooctanoic acid (PFOA)	2.00	2.08		ug/Kg		104	60 - 135	
Perfluorononanoic acid (PFNA)	2.00	2.01		ug/Kg		101	60 - 135	
Perfluorodecanoic acid (PFDA)	2.00	1.99		ug/Kg		99	60 - 135	
Perfluoroundecanoic acid (PFUnA)	2.00	1.95		ug/Kg		98	60 - 135	
Perfluorododecanoic acid (PFDoA)	2.00	2.03		ug/Kg		102	60 - 135	
Perfluorotridecanoic acid (PFTrDA)	2.00	1.91		ug/Kg		96	60 - 135	
Perfluorotetradecanoic acid (PFTeA)	2.00	2.07		ug/Kg		104	60 - 135	
Perfluorobutanesulfonic acid (PFBS)	1.77	1.84		ug/Kg		104	60 - 135	
Perfluoropentanesulfonic acid (PFPeS)	1.88	1.99		ug/Kg		106	60 - 135	
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.88		ug/Kg		103	60 - 135	
Perfluoroheptanesulfonic Acid (PFHpS)	1.90	1.93		ug/Kg		101	60 - 135	
Perfluoroctanesulfonic acid (PFOS)	1.86	1.99		ug/Kg		107	60 - 135	
Perfluoronananesulfonic acid (PFNS)	1.92	1.86		ug/Kg		97	60 - 135	
Perfluorodecanesulfonic acid (PFDS)	1.93	1.87		ug/Kg		97	60 - 135	
Perfluorododecanesulfonic acid (PFDoS)	1.94	1.93		ug/Kg		100	60 - 135	

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QC Sample Results

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-510168/2-A

Matrix: Solid

Analysis Batch: 510425

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 510168

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.
				ug/Kg	104	60 - 135	Limits
Perfluoroctanesulfonamide (FOSA)	2.00	2.08					
NEtFOSA	2.00	1.87		ug/Kg	94	60 - 135	
NMeFOSA	2.00	2.00		ug/Kg	100	60 - 135	
NMeFOSAA	2.00	1.74		ug/Kg	87	60 - 135	
NEtFOSAA	2.00	2.00		ug/Kg	100	60 - 135	
NMeFOSE	2.00	2.05		ug/Kg	102	60 - 135	
NETFOSE	2.00	2.04		ug/Kg	102	60 - 135	
4:2 FTS	1.87	1.93		ug/Kg	103	60 - 135	
6:2 FTS	1.90	1.95		ug/Kg	103	60 - 135	
8:2 FTS	1.92	2.13		ug/Kg	111	60 - 135	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.88	1.81		ug/Kg	96	60 - 135	
HFPO-DA (GenX)	2.00	2.15		ug/Kg	107	60 - 135	
9Cl-PF3ONS	1.86	1.82		ug/Kg	97	60 - 135	
11Cl-PF3OUdS	1.88	1.79		ug/Kg	95	60 - 135	

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFBA	76		25 - 150
13C5 PFPeA	85		25 - 150
13C2 PFHxA	82		25 - 150
13C4 PFHpA	84		25 - 150
13C4 PFOA	87		25 - 150
13C5 PFNA	88		25 - 150
13C2 PFDA	90		25 - 150
13C2 PFUnA	88		25 - 150
13C2 PFDoA	88		25 - 150
13C2 PFTeDA	82		25 - 150
13C3 PFBS	81		25 - 150
18O2 PFHxS	88		25 - 150
13C4 PFOS	91		25 - 150
13C8 FOSA	91		10 - 150
d3-NMeFOSAA	89		25 - 150
d5-NEtFOSAA	87		25 - 150
d-N-MeFOSA-M	85		10 - 150
d-N-EtFOSA-M	93		10 - 150
d7-N-MeFOSE-M	68		10 - 150
d9-N-EtFOSE-M	71		10 - 150
M2-4:2 FTS	110		25 - 150
M2-6:2 FTS	108		25 - 150
M2-8:2 FTS	98		25 - 150
13C3 HFPO-DA	84		25 - 150
13C2 10:2 FTS	84		25 - 150

QC Sample Results

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-76567-1 MS

Matrix: Solid

Analysis Batch: 510640

Client Sample ID: Class B Biosolids

Prep Type: Total/NA

Prep Batch: 510168

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec.	Limits
Perfluorobutanoic acid (PFBA)	<0.74		30.1	29.5		ug/Kg	⊗	98	70 - 130	
Perfluoropentanoic acid (PFPeA)	<0.66		30.1	30.1		ug/Kg	⊗	100	70 - 130	
Perfluorohexanoic acid (PFHxA)	3.2 I		30.1	34.1		ug/Kg	⊗	103	70 - 130	
Perfluoroheptanoic acid (PFHpA)	<0.61		30.1	31.1		ug/Kg	⊗	103	70 - 130	
Perfluorooctanoic acid (PFOA)	1.2 J		30.1	31.6		ug/Kg	⊗	101	70 - 130	
Perfluorononanoic acid (PFNA)	0.60 J		30.1	30.5		ug/Kg	⊗	99	70 - 130	
Perfluorodecanoic acid (PFDA)	4.9		30.1	37.3		ug/Kg	⊗	108	70 - 130	
Perfluoroundecanoic acid (PFUnA)	1.2 J		30.1	31.4		ug/Kg	⊗	100	70 - 130	
Perfluorododecanoic acid (PFDaO)	2.6 J		30.1	27.5		ug/Kg	⊗	83	70 - 130	
Perfluorotridecanoic acid (PFTrDA)	<0.34 F1		30.1	15.9 F1		ug/Kg	⊗	53	70 - 130	
Perfluorotetradecanoic acid (PFTeA)	1.0 J		30.1	30.9		ug/Kg	⊗	99	70 - 130	
Perfluorobutanesulfonic acid (PFBS)	<0.61		26.6	26.0		ug/Kg	⊗	98	70 - 130	
Perfluoropentanesulfonic acid (PFPeS)	<0.60		28.2	28.6		ug/Kg	⊗	101	70 - 130	
Perfluorohexanesulfonic acid (PFHxS)	2.0 J		27.3	30.2		ug/Kg	⊗	103	70 - 130	
Perfluoroheptanesulfonic Acid (PFHpS)	<0.79		28.6	27.4		ug/Kg	⊗	96	70 - 130	
Perfluorooctanesulfonic acid (PFOS)	8.0 I		27.9	35.1		ug/Kg	⊗	97	70 - 130	
Perfluoronananesulfonic acid (PFNS)	<0.47		28.9	28.6		ug/Kg	⊗	99	70 - 130	
Perfluorodecanesulfonic acid (PFDS)	2.4 J		29.0	27.4		ug/Kg	⊗	86	70 - 130	
Perfluorododecanesulfonic acid (PFDs)	<0.76 F1		29.1	17.5 I F1		ug/Kg	⊗	60	70 - 130	
Perfluorooctanesulfonamide (FOSA)	1.0 J		30.1	31.9		ug/Kg	⊗	103	70 - 130	
NEtFOSA	<0.76		30.1	29.4		ug/Kg	⊗	98	70 - 130	
NMeFOSA	<0.79		30.1	30.2		ug/Kg	⊗	101	70 - 130	
NMeFOSAA	13		30.1	40.8		ug/Kg	⊗	94	70 - 130	
NEtFOSAA	7.9		30.1	40.6		ug/Kg	⊗	109	70 - 130	
NMeFOSE	11		30.1	44.1		ug/Kg	⊗	110	70 - 130	
NEtFOSE	3.1 J		30.1	33.7		ug/Kg	⊗	102	70 - 130	
4:2 FTS	<0.82		28.1	28.0		ug/Kg	⊗	100	70 - 130	
6:2 FTS	<0.43		28.5	29.6		ug/Kg	⊗	104	70 - 130	
8:2 FTS	0.60 J		28.8	33.9		ug/Kg	⊗	116	70 - 130	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.63		28.3	22.6		ug/Kg	⊗	80	70 - 130	
HFPO-DA (GenX)	<0.66		30.1	31.9		ug/Kg	⊗	106	70 - 130	
9Cl-PF3ONS	<0.56 F1		28.0	19.4 F1		ug/Kg	⊗	69	70 - 130	
11Cl-PF3OUdS	<0.50		28.3	27.1		ug/Kg	⊗	96	70 - 130	
<hr/>										
Isotope Dilution	MS %Recovery	MS Qualifier	Limits							
13C4 PFBA	70		25 - 150							
13C5 PFPeA	80		25 - 150							
13C2 PFHxA	84		25 - 150							

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-76567-1 MS

Matrix: Solid

Analysis Batch: 510640

Client Sample ID: Class B Biosolids

Prep Type: Total/NA

Prep Batch: 510168

<i>Isotope Dilution</i>	<i>MS</i>	<i>MS</i>	<i>Qualifer</i>	<i>Limits</i>
	<i>%Recovery</i>			
13C4 PFHpA	88			25 - 150
13C4 PFOA	84			25 - 150
13C5 PFNA	87			25 - 150
13C2 PFDA	81			25 - 150
13C2 PFUnA	71			25 - 150
13C2 PFDoA	35			25 - 150
13C2 PFTeDA	30			25 - 150
13C3 PFBS	85			25 - 150
18O2 PFHxS	87			25 - 150
13C4 PFOS	93			25 - 150
13C8 FOSA	80			10 - 150
d3-NMeFOSAA	67			25 - 150
d5-NEtFOSAA	42			25 - 150
d-N-MeFOSA-M	56			10 - 150
d-N-EtFOSA-M	36			10 - 150
d7-N-MeFOSE-M	53			10 - 150
d9-N-EtFOSE-M	31			10 - 150
M2-4:2 FTS	139			25 - 150
M2-6:2 FTS	170 *5+			25 - 150
M2-8:2 FTS	190 *5+			25 - 150
13C3 HFPO-DA	82			25 - 150
13C2 10:2 FTS	62			25 - 150

Lab Sample ID: 320-76567-1 MSD

Matrix: Solid

Analysis Batch: 510640

Client Sample ID: Class B Biosolids

Prep Type: Total/NA

Prep Batch: 510168

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	Limits	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier						
Perfluorobutanoic acid (PFBA)	<0.74		31.1	31.4		ug/Kg	⊗	101	70 - 130	6	30
Perfluoropentanoic acid (PFPeA)	<0.66		31.1	32.9		ug/Kg	⊗	106	70 - 130	9	30
Perfluorohexanoic acid (PFHxA)	3.2 I		31.1	34.4		ug/Kg	⊗	100	70 - 130	1	30
Perfluoroheptanoic acid (PFHpA)	<0.61		31.1	33.0		ug/Kg	⊗	106	70 - 130	6	30
Perfluorooctanoic acid (PFOA)	1.2 J		31.1	35.7		ug/Kg	⊗	111	70 - 130	12	30
Perfluorononanoic acid (PFNA)	0.60 J		31.1	34.3		ug/Kg	⊗	108	70 - 130	12	30
Perfluorodecanoic acid (PFDA)	4.9		31.1	43.6		ug/Kg	⊗	125	70 - 130	16	30
Perfluoroundecanoic acid (PFUnA)	1.2 J		31.1	36.5		ug/Kg	⊗	114	70 - 130	15	30
Perfluorododecanoic acid (PFDoA)	2.6 J		31.1	37.4		ug/Kg	⊗	112	70 - 130	30	30
Perfluorotridecanoic acid (PFTrDA)	<0.34 F1		31.1	18.9 F1		ug/Kg	⊗	61	70 - 130	17	30
Perfluorotetradecanoic acid (PFTeA)	1.0 J		31.1	40.8		ug/Kg	⊗	128	70 - 130	28	30
Perfluorobutanesulfonic acid (PFBS)	<0.61		27.5	31.0		ug/Kg	⊗	113	70 - 130	18	30
Perfluoropentanesulfonic acid (PFPeS)	<0.60		29.1	30.6		ug/Kg	⊗	105	70 - 130	7	30
Perfluorohexanesulfonic acid (PFHxS)	2.0 J		28.3	31.5		ug/Kg	⊗	104	70 - 130	4	30
Perfluoroheptanesulfonic Acid (PFHpS)	<0.79		29.6	30.9		ug/Kg	⊗	104	70 - 130	12	30

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-76567-1 MSD

Matrix: Solid

Analysis Batch: 510640

Client Sample ID: Class B Biosolids

Prep Type: Total/NA

Prep Batch: 510168

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec.	Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	8.0	I	28.8	37.9		ug/Kg	⊗	104	70 - 130	8	30
Perfluorononanesulfonic acid (PFNS)	<0.47		29.8	32.1		ug/Kg	⊗	108	70 - 130	12	30
Perfluorodecanesulfonic acid (PFDS)	2.4	J	30.0	32.3		ug/Kg	⊗	100	70 - 130	16	30
Perfluorododecanesulfonic acid (PFDoS)	<0.76	F1	30.1	21.6	I	ug/Kg	⊗	72	70 - 130	21	30
Perfluorooctanesulfonamide (FOSA)	1.0	J	31.1	32.4		ug/Kg	⊗	101	70 - 130	1	30
NEtFOSA	<0.76		31.1	32.6		ug/Kg	⊗	105	70 - 130	10	30
NMeFOSA	<0.79		31.1	30.7		ug/Kg	⊗	99	70 - 130	1	30
NMeFOSAA	13		31.1	46.6		ug/Kg	⊗	109	70 - 130	13	30
NEtFOSAA	7.9		31.1	43.9		ug/Kg	⊗	116	70 - 130	8	30
NMeFOSE	11		31.1	46.7		ug/Kg	⊗	115	70 - 130	6	30
NEtFOSE	3.1	J	31.1	37.7		ug/Kg	⊗	111	70 - 130	11	30
4:2 FTS	<0.82		29.0	33.1		ug/Kg	⊗	114	70 - 130	17	30
6:2 FTS	<0.43		29.5	31.3		ug/Kg	⊗	106	70 - 130	5	30
8:2 FTS	0.60	J	29.8	34.9		ug/Kg	⊗	115	70 - 130	3	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.63		29.3	27.1		ug/Kg	⊗	93	70 - 130	18	30
HFPO-DA (GenX)	<0.66		31.1	34.9		ug/Kg	⊗	112	70 - 130	9	30
9Cl-PF3ONS	<0.56	F1	29.0	22.8		ug/Kg	⊗	79	70 - 130	16	30
11Cl-PF3OUds	<0.50		29.3	32.3		ug/Kg	⊗	110	70 - 130	17	30

Isotope Dilution	MSD	MSD	Limits
	%Recovery	Qualifier	
13C4 PFBA	68		25 - 150
13C5 PFPeA	77		25 - 150
13C2 PFHxA	79		25 - 150
13C4 PFHpA	82		25 - 150
13C4 PFOA	76		25 - 150
13C5 PFNA	78		25 - 150
13C2 PFDA	79		25 - 150
13C2 PFUnA	63		25 - 150
13C2 PFDoA	29		25 - 150
13C2 PFTeDA	27		25 - 150
13C3 PFBS	78		25 - 150
18O2 PFHxS	86		25 - 150
13C4 PFOS	82		25 - 150
13C8 FOSA	79		10 - 150
d3-NMeFOSAA	62		25 - 150
d5-NEtFOSAA	38		25 - 150
d-N-MeFOSA-M	58		10 - 150
d-N-EtFOSA-M	33		10 - 150
d7-N-MeFOSE-M	46		10 - 150
d9-N-EtFOSE-M	29		10 - 150
M2-4:2 FTS	134		25 - 150
M2-6:2 FTS	162 *5+		25 - 150
M2-8:2 FTS	178 *5+		25 - 150
13C3 HFPO-DA	82		25 - 150

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-76567-1 MSD

Client Sample ID: Class B Biosolids

Matrix: Solid

Prep Type: Total/NA

Analysis Batch: 510640

Prep Batch: 510168

Isotope Dilution	MSD	MSD	
	%Recovery	Qualifier	Limits
13C2 10:2 FTS	65		25 - 150

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QC Association Summary

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

LCMS

Prep Batch: 510168

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-76567-1	Class B Biosolids	Total/NA	Solid	SHAKE	
320-76567-2	Class B Biosolids Dup	Total/NA	Solid	SHAKE	
MB 320-510168/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-510168/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-76567-1 MS	Class B Biosolids	Total/NA	Solid	SHAKE	
320-76567-1 MSD	Class B Biosolids	Total/NA	Solid	SHAKE	

Analysis Batch: 510425

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-510168/1-A	Method Blank	Total/NA	Solid	537 (modified)	510168
LCS 320-510168/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	510168

Analysis Batch: 510640

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-76567-1	Class B Biosolids	Total/NA	Solid	537 (modified)	510168
320-76567-2	Class B Biosolids Dup	Total/NA	Solid	537 (modified)	510168
320-76567-1 MS	Class B Biosolids	Total/NA	Solid	537 (modified)	510168
320-76567-1 MSD	Class B Biosolids	Total/NA	Solid	537 (modified)	510168

General Chemistry

Analysis Batch: 509561

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-76567-1	Class B Biosolids	Total/NA	Solid	D 2216	
320-76567-2	Class B Biosolids Dup	Total/NA	Solid	D 2216	

Lab Chronicle

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Client Sample ID: Class B Biosolids

Date Collected: 07/19/21 00:00
Date Received: 07/22/21 09:40

Lab Sample ID: 320-76567-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			509561	07/23/21 10:03	TCS	TAL SAC

Client Sample ID: Class B Biosolids

Date Collected: 07/19/21 00:00
Date Received: 07/22/21 09:40

Lab Sample ID: 320-76567-1

Matrix: Solid

Percent Solids: 6.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.13 g	10.0 mL	510168	07/26/21 04:44	HK	TAL SAC
Total/NA	Analysis	537 (modified)		1			510640	07/27/21 15:20	D1R	TAL SAC

Client Sample ID: Class B Biosolids Dup

Date Collected: 07/19/21 00:00
Date Received: 07/22/21 09:40

Lab Sample ID: 320-76567-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			509561	07/23/21 10:03	TCS	TAL SAC

Client Sample ID: Class B Biosolids Dup

Date Collected: 07/19/21 00:00
Date Received: 07/22/21 09:40

Lab Sample ID: 320-76567-2

Matrix: Solid

Percent Solids: 5.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.10 g	10.0 mL	510168	07/26/21 04:44	HK	TAL SAC
Total/NA	Analysis	537 (modified)		1			510640	07/27/21 15:47	D1R	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Eurofins TestAmerica, Sacramento

Accreditation/Certification Summary

Client: Madison Metropolitan Sewerage District

Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Laboratory: Eurofins TestAmerica, Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	998204680	08-31-21

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

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Method Summary

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	TAL SAC

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

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Sample Summary

Client: Madison Metropolitan Sewerage District
Project/Site: PFAS Phase 1

Job ID: 320-76567-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-76567-1	Class B Biosolids	Solid	07/19/21 00:00	07/22/21 09:40
320-76567-2	Class B Biosolids Dup	Solid	07/19/21 00:00	07/22/21 09:40

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Chain of Custody Record

Address:

572118 eurofins

Environment Testing
TestAmerica

Regulatory Program: DW NPDES RCRA Other:

TAL-8210

TAL-8210

Client Contact		Project Manager: <u>Carol Mielke</u>	Site Contact: <u>David Attweder</u>	Date: <u>7/19/2021</u>	COC No: <u>1</u> of <u>1</u> COCs				
Company Name: <u>Madison Metro Sewer Dist</u> Address: <u>1600 Moorland Rd</u> City/State/Zip: <u>Madison WI 53713</u> Phone: <u>608 222 - 1201</u> Fax: <u>-</u> Project Name: <u>EAS Phase I</u> Site: <u>MMSD WATF</u> PO # <u>2100080</u>		Tel/Email: <u>carol.m@madisensewer.org</u>	Lab Contact: <u>Drew Snesse</u>	Carrier: <u></u>	Sampler: <u></u>				
		<input type="checkbox"/> CALENDAR DAYS	<input type="checkbox"/> WORKING DAYS	<input type="checkbox"/> TAT if different from Below _____ <u>X</u> <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day	<input type="checkbox"/> Perform MS / MSD (Y/N) <u>PFAS WI 36 cups</u> <u>Sp.1/95 104/56</u>				
		<input type="checkbox"/> Filtered Sample (Y/N)	<input type="checkbox"/> Preferred MS / MSD (Y/N)	<input type="checkbox"/> Sample Date	<input type="checkbox"/> Sample Time	<input type="checkbox"/> Sample Type (C=Comp, G=Grab)	<input type="checkbox"/> Matrix	<input type="checkbox"/> # of Cont.	<input type="checkbox"/> Sample Specific Notes: <u>This is a sample.</u> <u>We run @ dilution</u> <u>of 10^4 : ND for</u> <u>all crops. We</u> <u>want less of dilution</u> <u>to know if there</u> <u>is detection.</u>
		<input type="checkbox"/> DW	<input type="checkbox"/> INDES	<input type="checkbox"/> RCRA	<input type="checkbox"/> Other:	<input type="checkbox"/> Disposal by Lab	<input type="checkbox"/> Archive for _____ Months	<input type="checkbox"/> Return to Client	<input type="checkbox"/> Disposal by Lab
Regulatory Program:		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)							
Project Name: <u>Class B Biosolids</u>		<u>No time on coc or sample</u> <u>7/22/21</u>							
Project Name: <u>Class B Biosolids duplicate</u>		<u>Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other</u>							
Comments Section if the lab is to dispose of the sample		<u>Possible Hazard Identification:</u> <u>Are any samples from a listed EPA Hazardous Waste?</u> Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.							
<input type="checkbox"/> Non-Hazard		<input type="checkbox"/> Flammable <input type="checkbox"/> Poison B <input checked="" type="checkbox"/> Unknown							
Special Instructions/QC Requirements & Comments: <u>As little dilution as possible to know if compounds are present.</u>									
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.: <u>31</u>		Cooler temp. (°C): Obs'd: <u>3.8</u>		Corrd: <u>3.8</u>		Therm ID No.: <u>L-03</u>	
Relinquished by: <u>Carol Mielke</u>		Company: <u>Madison MSD</u>		Date/Time: <u>7/20/2021</u>	Received by: <u>David Attweder</u>	Company: <u>ETASAC</u>	Date/Time: <u>7-22-21 / 09:40</u>		
Relinquished by: <u></u>		Company: <u></u>		Date/Time: <u></u>	Received in Laboratory by: <u></u>	Company: <u></u>	Date/Time: <u></u>		
Relinquished by: <u></u>		Company: <u></u>		Date/Time: <u></u>	Received by: <u></u>	Company: <u></u>	Date/Time: <u></u>		

Login Sample Receipt Checklist

Client: Madison Metropolitan Sewerage District

Job Number: 320-76567-1

Login Number: 76567

List Source: Eurofins TestAmerica, Sacramento

List Number: 1

Creator: Nelson, Kym D

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Appendix D: Data Quality and Usability Review

Data Quality and Usability Review

TRC sampled Madison Metropolitan Sewerage District's (MMSD's) Nine Springs wastewater treatment plant influent, effluent, biosolids, polymer, and struvite on May 6, 2021 in conjunction with an initial characterization study. MMSD conducted a re-sampling event and sampled one biosolids sample on July 19, 2021. Samples were analyzed for the standard list of Wisconsin's 33 per- and polyfluoroalkyl substances (PFAS) and total oxidizable precursor (TOP) assay PFAS by Eurofins/TestAmerica (Eurofins) in West Sacramento, California and total suspended solids (TSS) and total solids by Eurofins in University Park, Illinois. The laboratory analytical results were reported in laboratory sample delivery groups (SDGs) 320-73382-1 Revision 2, 320-73382-2 Revision 2, and 320-76567-1 Revision 1.

Each sample was analyzed for one or more of the following constituents:

Analyte Group	Method
PFAS (33 Analytes)	EPA Modified Method 537.1/WI Method Criteria
PFAS TOP Assay	EPA Modified Method 537.1
Total Suspended Solids (TSS)	SM 2540D
Total Solids	SM 2540B

TRC performed a limited validation of the laboratory data to assess data usability. The following sections summarize the data validation procedure and the results of the validation.

Data Usability Review Procedure

The analytical data were reviewed using the USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537 (EPA 910-R-18-001), November 2018 and Wisconsin PFAS Aqueous (Non-Potable Water) and Non-Aqueous Matrices Method Expectations, Document # EA-19-0001, WDNR, December 2019 as guidance for data review. EPA- 910-R-18-001 applies to method 537 and drinking water matrices only but the guidance can be applied in part or in whole to evaluate data in non-drinking water matrices. The following items were specifically included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to the ranges of RLs suggested in the Sampling and Analysis Blueprint (SAB) of 2-5 ng/L and 1-5 ug/kg per individual PFAS;
- Data for method blanks, equipment blanks, and field blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCSs and/or LCSDs are used to assess the accuracy and precision of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicate (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;

- Percent recoveries for isotopically labeled surrogates. Percent recoveries are calculated for each surrogate and used to assess the accuracy of the extraction procedure and bias due to sample matrix effects;
- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation are noted below.

- The reviewed PFAS, TSS, and total solids data will be utilized for the purposes of an initial characterization.
- Data are usable for the purposes of the initial characterization with the exception of the TOP Assay data.

QA/QC Sample Summary

- A method blank was analyzed with each analytical batch for PFAS, TSS, and total solids. PFAS, TSS, and total solids were not detected in the method blanks.
- One equipment blank (EB-01) and three field blanks (FB-01, FB-02, FB-03) were collected. Target analytes were not detected in these blank samples.
- All samples were extracted and analyzed within the holding time.
- The LCS and LCSD recoveries and relative percent differences (RPDs) for all analytes were within QC limits.
- MS and MSD analyses were performed on samples BIOSOLIDS-A-20210506 and Class B Biosolids for PFAS (33 analytes).
 - Sample BIOSOLIDS-A-20210506 MS and/or MSD recoveries for several PFAS were above method criteria. If the affected PFAS were detected in sample BIOSOLIDS-A-20210506, the results were qualified as estimated (J). Results for PFPeA, PFHxA, PFOA, PFNA, PFOS, PFDS, NEtFOSAA, and NMeFOSE were qualified as estimated (J) in sample BIOSOLIDS-A-20210506 as indicated in Table 2.
 - Sample BIOSOLIDS-A-20210506 MS and/or MSD recoveries for PFDA and 4:2 FTS were below method criteria. 4:2 FTS was qualified as estimated nondetect (UJ) and PFDA was qualified as estimated (J) as indicated on Table 2.

- Sample Class B Biosolids MS and/or MSD recoveries for PFTrDa (also referred to as PFTriA), PFDoS, and 9CI-PF3ONS (also referred to as F-53B Major) were below method criteria and were qualified as estimated nondetect (UJ) as indicated in Table 2.
- The field duplicate pair samples were INFLUENT-08-20210506/DUP01-20210506, EFFLUENT-PERM-20210506/DUP02-20210506, BIOSOLIDS-B-20210506/DUP03-20210506, POLYMER-3-20210506/DUP04-20210506, and Class B Biosolids/Class B Biosolids Dup. All criteria were met with the following exceptions:
 - Samples INFLUENT-08-20210506/DUP01-20210506 detected PFNA, PFDA, PPpEs, PFNS, 6:2 FTS, NMeFOSE and PFBS in only one of the two samples at concentrations below the RL; the relative percent differences (RPDs) are not calculable. No data were qualified.
 - Samples EFFLUENT-PERM-20210506/DUP02-20210506 detected PFBS and FOSA in only one of the two samples; the RPDs are not calculable. The detected concentration of PFBS was greater than two times the RL; the result for PFBS in sample EFFLUENT-PERM-20210506 was qualified as estimated (J) and the result for PFBS in sample DUP02-20210506 was qualified as estimated nondetect (UJ) as indicated in Table 1.
 - Several isotopically labeled surrogate percent recoveries (%R) were outside of criteria; results were qualified as follows and as indicated in Tables 1 and 3:
 - POLYMER-1-20210506
 - PPpEA – UJ
 - NEtFOSA – UJ
 - POLYMER-2-20210506
 - PFTeDA – UJ
 - PFTriA – UJ
 - NMeFOSE – UJ
 - NEtFOSE – UJ
 - DUP01-20210506
 - PFDoA – UJ
 - PFTeA – UJ
 - PFTriA – UJ
 - PPpEA – J
 - NMeFOSAA – UJ
 - NEtFOSAA – UJ
 - INFLUENT-02-20210506
 - PFDoA – UJ
 - NEtFOSAA – UJ
 - INFLUENT-07-20210506
 - PFDoA – UJ
 - PFTeA – UJ

- PFTriA – UJ
- INFLUENT-08-20210506
 - PFDoA – UJ
 - NEtFOSAA – UJ
- INFLUENT-11-20210506
 - PFDoA – UJ
 - PFTeA – UJ
 - PFTriA – UJ
 - NMeFOSAA – UJ
 - NEtFOSAA – UJ
- INFLUENT-18-20210506
 - PFDoA – UJ
- Several isotopically labeled surrogate (%R) were significantly below criteria (i.e., <10%) in the pretreatment and post-treatment TOP Assay analyses of samples POLYMER-1-20210506, POLYMER-2-20210506, and POLYMER-3-20210506 samples and would result in the rejecting of several PFAS analytes. Due to the %R issues, and, for the purpose of this characterization, the results of the polymer analyses for the WI 33 PFAS list in SDG 320-79982-1 Revision 2 and not the TOP Assay PFAS results from SDG 320-79982-2 Revision 2 should be used for making conclusions in the report.
- Samples BIOSOLIDS-B-20210506 and DUP03-20210506 from SDG 320-73382-1 were resampled due to a 10-fold dilution being applied by the laboratory that resulted in elevated non-detect results for several PFAS in the original collection in May 2021. Samples Class B Biosolids and Class B Biosolids Dup from SDG 320-76567-1 Revision 1 were analyzed by the laboratory without dilution.
- The case narrative of SDG 320-73382-1 noted that during the solid phase extraction process, the following samples contain non-settable particulates which clogged the solid phase extraction column: INFLUENT-02-20210506, INFLUENT-07-20210506, INFLUENT-08-20210506, INFLUENT-11-20210506), INFLUENT-18-20210506, and DUP01-20210506. The laboratory confirmed that the particulates were rinsed and included in the extraction.