SHANNON & WILSON

February 13, 2024

Ms. Taine Wilton
Edmonds School District
20420 68th Avenue West
Lynnwood, WA 98036

RE: REVISED FINAL RESULTS OF SUPPLEMENTAL STORMWATER MONITORING FOR PFAS, MADRONA K-8 SCHOOL REPLACEMENT PROJECT, EDMONDS, WASHINGTON

Dear Ms. Wilton:

This letter report summarizes the procedures and results of supplemental sampling of stormwater for analyses of per- and polyfluoroalkyl substances (PFAS) at the Edmonds School District No. 15 (ESD) Madrona K-8 School Replacement Project (Project). The purpose of this voluntary sampling event was to objectively evaluate for the presence of PFAS in stormwater following stormwater sampling conducted by Olympic View Water and Sewer District (OVWSD) on October 22, 2022. Because the procedures used to collect stormwater samples by OVWSD were not provided, the usability and validity of their data are unknown. A map of the project location is provided as Figure 1. This letter is revised from the final version dated February 8, 2024, to correct the pagination.

BACKGROUND

The Project's stormwater management system incorporates components such as bioretention planters, oil/water separation, and 16 stormwater dry wells, also known as underground injection controls. The Project, which occupies the east half of a 40-acre ESD property, is located on a hill capped by glacial till. The Project dry wells convey stormwater into unsaturated glacial outwash soils beneath the till. The dry wells are rule authorized by the Washington State Department of Ecology (Ecology) (UIC Site No. 33981) and were put into operation on July 3, 2020.

Because the Project is within the buffer zone of a municipal groundwater source, ESD entered into a memorandum of understanding agreement with OVWSD to implement the Quality Assurance Project Plan (QAPP), Groundwater and Stormwater Monitoring

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(Shannon & Wilson, 2019[1]). The QAPP requires periodic measurement of groundwater levels and groundwater gradient, along with sampling of groundwater and stormwater. Stormwater and groundwater sampling efforts to date are documented in previous reports for the site. The QAPP does not include any sampling for PFAS.

Without seeking access permission from ESD or otherwise informing ESD of its intent to access ESD property to conduct a sampling event, on October 22, 2022, OVWSD reportedly collected two "dip" grab stormwater samples from storm drain catch basin (SDCB) 105 and a playground catch basin on the Project property, (see Figure 2). We infer the "playground catch basin" is SDCB 209, based on information provided by OVWSD. The two water samples were analyzed for PFAS by U.S. Environmental Protection Agency (EPA) Method 533 by Anatek Labs of Moscow, Idaho. In an email to ESD dated January 26, 2023, OVWSD stated that "...enhanced future requirements and the health concerns related to PFAS are why we are actively sampling the District looking for potential concerns." In the January 26, 2023, email, OVWSD stated that the samples had not been "verified."

The regular monitoring scope and chemicals are outlined in the Stormwater and Revised Groundwater Monitoring Plan (Monitoring Plan) (Appendix A of the QAPP) and were agreed upon between ESD, OVWSD, and Ecology. The OVWSD sampling event undertaken on the Project property was not prescribed within the agreed Monitoring Plan, and the sampling procedures and field parameters, if any, have not been provided by OVWSD to date. PFAS compounds are not listed analytes in the Monitoring Plan. SDCB 105 is one of the two stormwater sampling locations identified in the Project Monitoring Plan, but SDCB 209 is not (assuming that is the playground catch basin OVWSD refers to). The stormwater collected at SDCB 209 is upstream of the other Monitoring Plan stormwater sampling location, SDCB 205 (Figure 2).

The analytical results of samples collected by OVWSD are summarized in Table 1.

At the request of ESD, we prepared a Sampling Addendum[2] to the Monitoring Plan to outline the PFAS-specific field procedures and lab procedures. The purpose of the sampling event outlined in the Sampling Addendum was to objectively evaluate for the presence of

[1] Shannon & Wilson, 2019, Quality assurance project plan, groundwater and stormwater monitoring, Madrona K-8 School Replacement Project, Edmonds, Wash.: Report prepared by Shannon & Wilson, Inc., Seattle, Wash., job no. 21-1-22082-011, for Edmonds School District No. 15, October 7.
[2] Shannon & Wilson, 2023, Sampling addendum to the Stormwater Monitoring Plan, Madrona K-8 school replacement project, Edmonds, Washington: Letter prepared by Shannon & Wilson, Seattle, Wash., for Edmonds School District, Edmonds, Wash., April 25.

PFAS in stormwater, because the procedures used to collect stormwater samples on October 22, 2022, were not provided by OVWSD, and therefore the validity and usability of their data are unknown.

SAMPLING APPROACH

This section summarizes the sampling approach prescribed in the Sampling Addendum and implemented on October 16, 2023.

Timing and Location

Samples were collected during a storm event, defined as a precipitation event of greater than 0.1 inch over a 24-hour period and resulting in a stormwater discharge from the facility. Sampling of the targeted storm event was intended to begin within approximately the first 5 hours of when flow begins to enter SDCB 105, and ideally within about 5 hours of the start of the storm event. (Based on our experience at the site, inflow may not begin to occur at SDCD 105 until more than 5 hours after the start of a storm event, as the upstream bioretention planters must first become saturated.)

We collected stormwater samples from the planned catch basin sampling points on October 16, 2023. Rain began at about 4:00 this day, with rain intensifying at about 7:45. We arrived on-site at 9:10, with the intent of sampling within 5 hours or less of the start of the rain event and/or the start of inflow at SDCB 105 from the adjacent oil-water separator. We initially checked for inflow from the oil-water separator to SDCB 105 at 9:33; there was none at this time. We checked for inflow again at 10:35; observing inflow, we initiated sampling. We completed sampling activities by 14:00. According to online data from the King County Hydrologic Information Center,[3] the accumulated precipitation from the start of rainfall at about 4:00 until we completed sampling activities at 14:00 was 0.49 inch, based on the Edmonds Rain Gage at Westgate (EDM) located about 0.7 mile north/northwest of the Project site. This gage recorded 0.02 inch of antecedent precipitation on October 15, 2023.

Exhibits 1 and 2 below provide views of the internal conditions at each of the SDCBs during the October 16, 2023, sampling event.

[3] King County, 2023, Hydrologic Information Center, data download, multi-parameter data, site: EDM: available: https://green2.kingcounty.gov/hydrology/DataDownload.aspx?G_ID=2059&Parameter=Precipitation

Exhibit 1: View of the interior of SDCB 105. The stormwater sample was collected as water exited the green pipe without the elbow. The pipes with downturned elbows distribute water to Wellfield 1 dry wells.

Exhibit 2: View of the interior of SDCB 205. The stormwater sample was collected as water exited the green pipe without the elbow. The pipes with downturned elbows distribute water to Wellfield 2 dry wells.

Sample Collection

We used a dedicated sampling pole for each catch basin for collection of laboratory samples and field parameter samples. During sample collection activities, we took precautions to limit the potential for cross-contamination of PFAS to stormwater samples. The laboratory-supplied sample containers were attached to the pole and were filled directly beneath the outfall within the SDCBs. The collected stormwater did not contact the sampling equipment (poles and rachet straps), and sampled stormwater was collected prior to it mixing with standing water at the bottom of the SDCB. We limited the use of materials in the vicinity that may have trace amounts of PFAS, including but not limited to the following: clothing and personal protective equipment treated for water, fire, or stain resistance; food and food packaging; waterproof paper; permanent markers; and chemical ice packs.

As described in the QAPP and Sampling Addendum, time-proportionate composite samples were collected to provide data that are more representative of a storm event than single grab samples. A time-proportionate composite sample is composed of equal portions of multiple individual samples (referred to as aliquots) taken from a single location at approximately uniform time intervals.

We collected three approximately time-proportionate sample aliquots for laboratory analysis and field parameters at each sample location (SDCB 105 and SDCB 205). The three sample aliquots were collected at intervals of about 1 to 1.5 hours. To collect each aliquot, we collected stormwater using a dedicated pole with an attached laboratory-supplied sample container, as described above. A new laboratory-supplied sample container was used for collection of each aliquot.

We alternated sampling between SDCBs, collecting the first aliquot at SDCB 105, then moving to SDCB 205 to collect its first aliquot, then returning to SDCB 105 to collect its second aliquot, etc. It took about 1 hour to loosen the bolts securing the lid at SDCB 205, resulting in the interval between the first and second aliquots collected at SDCB 105 being about 1.5 hours. The interval between the rest of the aliquots collected at SDCB 105 and SDCB 205 was about 1 hour.

The laboratory combined equal portions of each sample aliquot to create composite samples. Sample aliquots and composite samples were identified as follows:

- Sample aliquots taken from SDCB 105 will be identified as SDCB105-A, SDCB105-B, and SDCB105-C. The laboratory-generated composite sample was identified as SDCB105-Comp.
- Sample aliquots taken from SDCB 205 were identified as SDCB205-A, SDCB205-B, and SDCB205-C. The laboratory-generated composite sample was identified as SDCB205-Comp.
- A field duplicate sample was collected from SDCB 205 for laboratory analysis. Sample aliquots for the duplicate were identified as SDCB-Drain-A-A, SDCB-Drain-A-B, and SDCB-Drain-A-C. We alternated filling the primary sample and the field duplicate sample bottles in the following manner: we filled the primary sample bottle so that it was approximately half-full, repeated the process with the field duplicate bottle, filled the remainder of the primary sample bottle so that it was completely full, and then repeated the process with the field duplicate bottle. The laboratory-generated composite sample was identified as SDCB-Drain-A-Comp.

We measured water quality field parameters on-site with calibrated turbidity and multiparameter water quality meters. We collected each field parameter sample using a dedicated sampling pole with an attached dedicated water collection container; the laboratory-supplied container consisted of the same material as the laboratory sample containers. The container used for measurements of water quality parameters was not used for collection of the samples for submission to the laboratory. The container was gently lowered to the approximate mid-stream of the stormwater flowing from the outfall in the SBCD, while avoiding disturbance of sediment within the catch basin. The container was filled, then lifted out of the SDCB, and the water was then immediately transferred to other containers for measurement of field water quality parameters.

Water quality parameters were recorded to the following standards:

- pH to plus or minus (±)0.01 pH units
- Specific conductivity to ±0.1 micromhos per centimeter
- Temperature to ±0.1 degree Celsius
- Dissolved oxygen to ±0.01 milligrams per liter
- Turbidity to ±0.01 nephelometric turbidity unit

LABORATORY ANALYSIS

Stormwater samples were submitted to Eurofins Sacramento of West Sacramento, California, for analysis of PFAS using draft U.S. Environmental Protection Agency (EPA) Method 1633. OVWSD reported that they used EPA Method 533 for the OVWSD samples;

that method is approved by the EPA for analysis of drinking water samples. Draft EPA Method 1633 is designed for non-drinking water aqueous matrices, such as stormwater, and it is being developed in concert with the U.S. Department of Defense. Since EPA Method 1633 was introduced in August 2021, the method has been through multiple drafts, incorporating feedback from laboratories.

In addition to the standard preparation steps detailed in EPA Method 1633, the composite samples were centrifuged and decanted to remove particulates prior to analysis of the water. The decanted water was then analyzed. This centrifuge preparation step was selected to provide results that are more representative of water that may infiltrate through different layers of soil in the aquifer.

Results were reported for 40 PFAS analytes, including all the analytes that EPA Method 533 tests for, and other PFAS compounds. The lab report is enclosed with this letter, and the analytical results are summarized in Table 2.

Measurements of field water quality parameters are provided in Table 3.

QUALITY REVIEW

Shannon & Wilson performed an EPA Stage 2B (summary) validation on the analytical results. Validation procedures were consistent with the requirements described in the QAPP.

Based on the quality review, no results were assigned additional qualifiers, and no samples were rejected as unusable due to quality control failures. In general, the quality of the analytical data for this reporting period does not appear to have been compromised by analytical irregularities. The analytical results appear to be usable for the purposes of the Project. Further details of the quality review are provided in Appendix A.

RESULTS

Multiple PFAS compounds were detected in the stormwater samples collected on October 16, 2023. There are not currently any applicable screening levels for PFAS in stormwater, but listed in Table 2 are potentially applicable screening levels, including the Model Toxics Control Act Method B groundwater cleanup levels protective of potable water and Washington Department of Health State PFAS Action Levels for drinking water.

Of note, the potentially applicable screening levels presented in Table 2 are for groundwater and drinking water media. The samples collected on October 16, 2023, were stormwater,

and PFAS screening levels for stormwater are not established. Furthermore, PFAS screening levels are not listed analytes in the Monitoring Plan agreed upon between ESD, OVWSD, and Ecology.

CONCLUSIONS

We performed supplemental stormwater monitoring for PFAS in accordance with the Project QAPP and Sampling Addendum. We collected the stormwater samples prior to the stormwater's point of entry into wellfields 1 and 2. Concentrations of PFAS were detected in the stormwater samples; however, screening levels for PFAS in stormwater are not established.

LIMITATIONS

The analyses and findings contained in this letter report are based on site conditions as they presently exist. We assume that the Project's field explorations are representative of the conditions at the Project site. Within the limitations of the scope, schedule, and budget, the analyses and findings presented in this letter report were prepared in accordance with generally accepted professional environmental, geotechnical, and hydrogeologic principles and practices in this area at the time this letter report was prepared. We make no other warranty, either express or implied. These findings were based on our understanding of the Project as described in this letter report and the site conditions as interpreted from the field explorations and stormwater sampling. Regulatory agencies may reach different conclusions than Shannon & Wilson.

This letter report was prepared for the exclusive use of ESD. It should be made available to others for information on factual data only. It should not be provided as a warranty of stormwater quality or subsurface conditions such as those interpreted from the construction drawings or exploration logs and presented in the discussions of stormwater or subsurface conditions included in this letter report.

Shannon & Wilson has prepared the attached "Important Information About Your Geotechnical/Environmental Report" to help you and others understand the use and limitations of our letter report.

Sincerely,

SHANNON & WILSON

2/13/2024

Ryan B. Peterson, PE
Environmental Engineer

RBP:PVH:KRF:MJS/rbp:pvh

Enc. Table 1 – Analytical Results for Stormwater Samples Collected by OVWSD on October 22, 2022 (2 pages)
Table 2 – Analytical Results for Stormwater Samples Collected October 16, 2023 (2 pages)
Table 3 – Field Parameter Results for Stormwater Samples Collected October 16, 2023
Figure 1 – Vicinity Map
Figure 2 – Sample Locations Map
Appendix A – Analytical Quality Assurance and Quality Control Summary
Eurofins Sacramento Lab Report, Job No. 320-106086-1, Dated December 1, 2023 (44 pages)
Important Information About Your Geotechnical/Environmental Report

Table 1: Analytical Results for Stormwater Samples Collected by OVWSD on October 22, 2022

Analyte	Potentially Applicable Screening Levels		Storm Drain Catch Basin 105 (Parking Lot) "Storm Drain SDCB 105 Parking Lot" 10/22/2022	Storm Drain Catch Basin 209 (Playground) "Meadrora School Playground" 10/22/2022
	WA Department of Ecology MTCA Method B Groundwater Cleanup Levels Protective of Potable Groundwater	WA Department of Health SALs for Drinking Water		
11Cl-PF3OUdS			< 2.00	< 2.00
4:2 FTS			< 2.00	< 2.00
6:2 FTS			< 2.00	< 2.00
8:2 FTS			< 2.00	< 2.00
9Cl-PF3ONS			< 2.00	< 2.00
ADONA			< 2.00	< 2.00
HFPO-DA	24		< 2.00	< 2.00
NFDHA			< 2.00	< 2.00
PFBA	8,000		67.4	38.2
PFBS	4,800	345	5.94	10.6
PFDA			7.98	3.38
PFDoA			< 2.00	< 2.00
PFEESA			< 2.00	< 2.00
PFHpA			15.1	13.1
PFHpS			< 2.00	< 2.00
PFHxA	8,000		136	85.6
PFHxS	160	65	< 2.00	< 2.00
PFMBA			< 2.00	< 2.00
PFMPA			< 2.00	< 2.00
PFNA	40	9	5.12	4.6
PFOA	48	10	32.2	29.4
PFOS	48	15	18.9	8.86
PFPeA			122	78.6
PFPeS			< 2.00	< 2.00
PFUnA			2.78	< 2.00

NOTES:

Analyte detected at a concentration greater than a potentially applicable screening level.

Units are nanograms per liter (ng/L).

Bolded text indicates the analyte was detected above the reporting limit.

MTCA = Model Toxics Control Act; ng/L = nanogram per liter; SAL = state action level; SDCB = stormwater catch basin; WA = Washington State

Table 1: Analytical Results for Stormwater Samples Collected by OVWSD on October 22, 2022

Analyte Abbreviation	Definition
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
4:2 FTS	1H,1H,2H,2H-Perfluorohexane sulfonic acid
6:2 FTS	1H,1H,2H,2H-Perfluorooctane sulfonic acid
8:2 FTS	1H,1H,2H,2H-Perfluorodecane sulfonic acid
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
ADONA	4,8-Dioxa-3H-perfluorononanoic acid
HFPO-DA	Hexafluoropropylene Oxide Dimer Acid
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid
PFBA	Perfluorobutanoic acid
PFBS	Perfluorobutanesulfonic acid
PFDA	Perfluorodecanoic acid
PFDoA	Perfluorododecanoic acid
PFEESA	Perfluoro
PFHpA	Perfluoroheptanoic acid
PFHpS	Perfluoroheptanesulfonic acid
PFHxA	Perfluorohexanoic acid
PFHxS	Perfluorohexanesulfonic acid
PFMBA	Perfluoro-4-methoxybutanoic acid
PFMPA	Perfluoro-3-methoxypropanoic acid
PFNA	Perfluorononanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PFPeA	Perfluoropentanoic acid
PFPeS	Perfluoropentanesulfonic acid
PFUnA	Perfluoroundecanoic acid

Table 2: Analytical Results for Stormwater Samples Collected October 16, 2023

Analyte	Potentially Applicable Screening Levels		Storm Drain Catch Basin 105 (Parking Lot)	Storm Drain Catch Basin 205 (Playground)		
	WA of Ecology MTCA Method B Groundwater Cleanup Levels Protective of Potable Groundwater	WA Department of Health SALs for Drinking Water	SDCB105-Comp 10/16/2023	SDCB205-Comp 10/16/2023	SDCB-DRAIN-A-Comp 10/16/2023 (Duplicate)	Duplicate RPD (%)
11Cl-PF3OUdS			< 7.8	< 7.8	< 7.8	
3:3 FTCA			< 9.8	< 9.8	< 9.8	
4:2 FTS			< 7.8	< 7.8	< 7.8	
5:3 FTCA			< 49	< 49	< 49	
6:2 FTS			< 7.8	< 7.8	< 7.8	
7:3 FTCA			< 49	< 49	< 49	
8:2 FTS			< 7.8	< 7.8	< 7.8	
9Cl-PF3ONS			< 7.8	< 7.8	< 7.8	
ADONA			< 7.8	< 7.8	< 7.8	
HFPO-DA	24		< 7.8	< 7.8	< 7.8	
NEtFOSA			< 2	< 2	< 2	
NEtFOSAA			< 2	< 2	< 2	
NEtFOSE			< 20	< 20	< 20	
NFDHA			< 3.9	< 3.9	< 3.9	
NMeFOSA			< 2	< 2	< 2	
NMeFOSAA			< 2	< 2	< 2	
NMeFOSE			< 20	< 20	< 20	
PFBA	8,000		35	12	12	0.0
PFBS	4,800	345	4.2	3.4	3.7	8.5
PFDA			4.5	1.4 J	1.5 J	6.9
PFDoA			< 2	< 2	< 2	
PFDoS			< 2	< 2	< 2	
PFDS			< 2	< 2	< 2	
PFEESA			< 3.9	< 3.9	< 3.9	
PFHpA			17	5.7	6.1	6.8
PFHpS			< 2	< 2	< 2	
PFHxA	8,000		99	28	27	3.6
PFHxS	160	65	1.1 J	1.1 J	1.1 J	0.0
PFMBA			< 3.9	< 3.9	< 3.9	
PFMPA			< 3.9	< 3.9	< 3.9	
PFNA	40	9	5.2	2.2	2.2	0.0
PFNS			< 2	< 2	< 2	
PFOA	48	10	22	7.6	5.9	25.2
PFOS	48	15	8.2	3.5	3.6	2.8
PFOSA			< 2	< 2	< 2	
PFPeA			74	33	33	0.0
PFPeS			< 2	< 2	< 2	
PFTeDA			< 2	< 2	< 2	
PFTrDA			< 2	< 2	< 2	
PFUnA			< 2	< 2	< 2	

Table 2: Analytical Results for Stormwater Samples Collected October 16, 2023

NOTES:

Analyte detected at a concentration greater than a potentially applicable screening level.

Units are nanograms per liter (ng/L).

Bolded text indicates the analyte was detected above the reporting limit.

MTCA = Model Toxics Control Act; ng/L = nanogram per liter; RPD = relative percent difference; SAL = state action level; SDCB = stormwater catch basin; WA = Washington State

J = Result is less than te reporting limit but greater than or equal to the method detection limit and the concetnraiton is an approximate value.

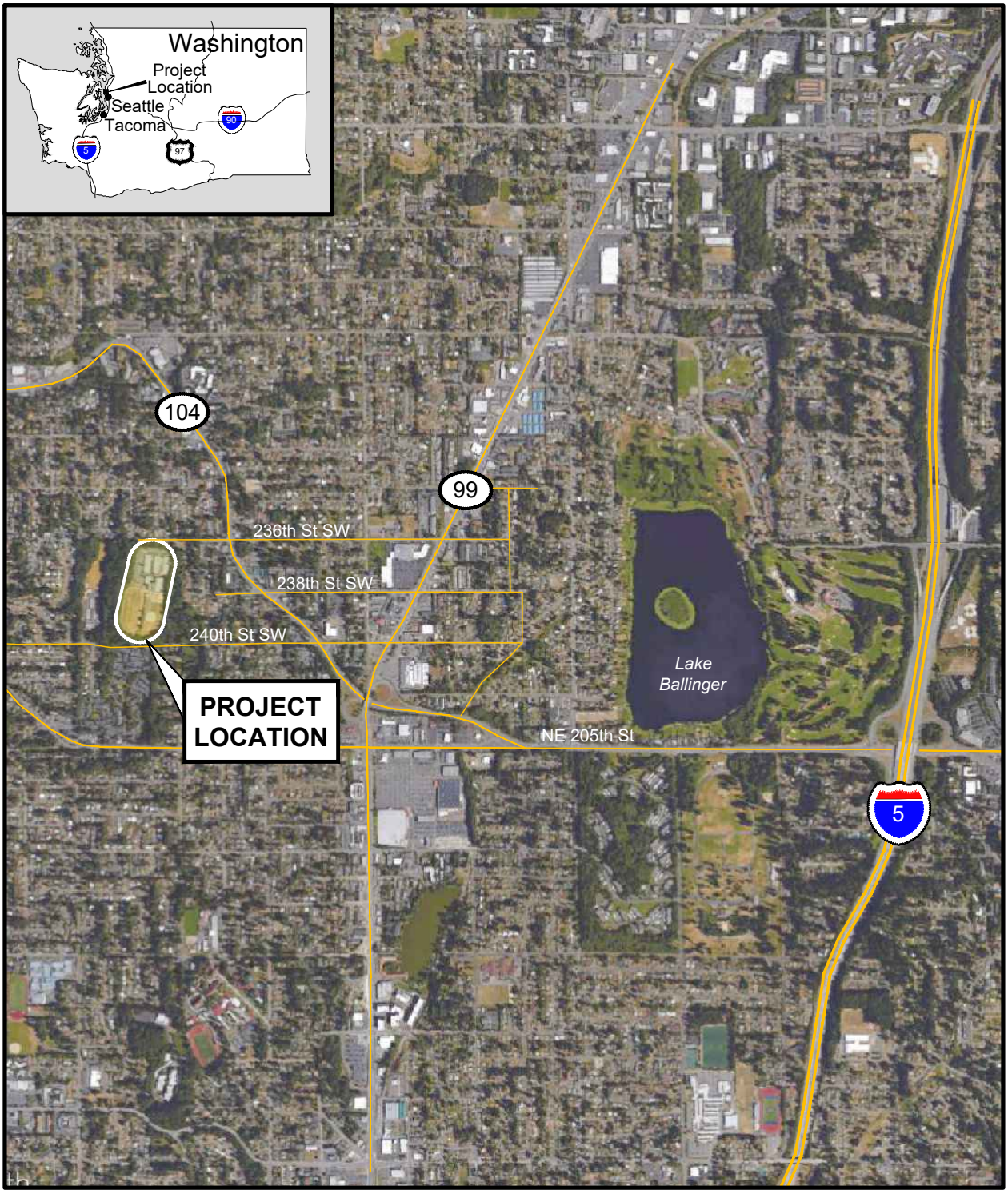
Analyte Abbreviation	Definition
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
3:3 FTCA	3-Perfluoropropylpropanoic acid
4:2 FTS	1H,1H,2H,2H-Perfluorohexane sulfonic acid
5:3 FTCA	3-Perfluoropentylpropanoic acid
6:2 FTS	1H,1H,2H,2H-Perfluorooctane sulfonic acid
7:3 FTCA	3-Perfluoroheptylpropanoic acid
8:2 FTS	1H,1H,2H,2H-Perfluorodecane sulfonic acid
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
ADONA	4,8-Dioxa-3H-perfluorononanoic acid
HFPO-DA	Hexafluoropropylene Oxide Dimer Acid
NEtFOSA	N-ethylperfluorooctane sulfonamide
NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid
NEtFOSE	N-ethylperfluorooctane sulfonamidoethanol
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid
NMeFOSA	N-methylperfluorooctane sulfonamide
NMeFOSAA	N-methylperfluorooctanesulfonamidoacetic acid
NMeFOSE	N-methylperfluorooctane sulfonamidoethanol
PFBA	Perfluorobutanoic acid
PFBS	Perfluorobutanesulfonic acid
PFDA	Perfluorodecanoic acid
PFDoA	Perfluorododecanoic acid
PFDoS	Perfluorododecanesulfonic acid
PFDS	Perfluorodecanesulfonic acid
PFEESA	Perfluoro
PFHpA	Perfluoroheptanoic acid
PFHpS	Perfluoroheptanesulfonic acid
PFHxA	Perfluorohexanoic acid
PFHxS	Perfluorohexanesulfonic acid
PFMBA	Perfluoro-4-methoxybutanoic acid
PFMPA	Perfluoro-3-methoxypropanoic acid
PFNA	Perfluorononanoic acid
PFNS	Perfluorononanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PFOSA	Perfluorooctanesulfonamide
PFPeA	Perfluoropentanoic acid
PFPeS	Perfluoropentanesulfonic acid
PFTeDA	Perfluorotetradecanoic acid
PFTrDA	Perfluorotridecanoic acid
PFUnA	Perfluoroundecanoic acid

Table 3: Field Parameter Results for Stormwater Samples Collected on October 16, 2023

Analyte	Storm Drain Catch Basin 105 (Parking Lot)			Storm Drain Catch Basin 205 (Playground)		
	Aliquot SDCB105-A	Aliquot SDCB105-B	Aliquot SDCB105-C	Aliquot SDCB205-A	Aliquot SDCB205-B	Aliquot SDCB205-C
pH	7.16	7.10	7.11	7.10	7.25	7.26
Temperature (^{o}C)	16.4	16.6	16.9	16.5	17.0	17.2
Specific Conductance (µS/cm)	225.5	211.7	210.6	163.6	170.2	182.7
Dissolved Oxygen (mg/L)	4.35	5.49	4.74	7.03	7.61	7.74
Turbidity (NTU)	2.56	3.52	3.74	10.8	8.83	7.95

NOTES:

^{o}C = degrees Celsius; µS/cm = microSiemens per centimeter; mg/L = milligrams per liter; NTU = nephelometric turbidity units



0 2,000 4,000

Approximate Scale in Feet

Madrona K-8 School Replacement Project
Edmonds, Washington

VICINITY MAP

February 2024 21-1-22082-014

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 1

Filename: C:\Users\jrs\CAD Group Dropbox\JDrive\211\22082\014\21-1-22082-014 Vicinity Map.dwg Date: 01-31-2024 Login: JRS

Notes:

1. Locations are approximate.
2. Stormwater network layers obtained from City of Edmonds GIS, accessed April 14, 2023, website: https://www.edmondswa.gov/services/maps_gis

February 2024

SAMPLING LOCATIONS

Figure 2

APPENDIX A: ANALYTICAL QUALITY ASSURANCE AND QUALITY CONTROL

Appendix A

Analytical Quality Assurance and Quality Control Summary

CONTENTS

Enclosure

Laboratory Data Review Checklist

APPENDIX A: ANALYTICAL QUALITY ASSURANCE AND QUALITY CONTROL

Quality assurance (QA)/quality control (QC) procedures assist in producing data of acceptable quality and reliability. Analytical results for laboratory QC samples were reviewed and a QA assessment of the data was conducted as the data were generated. The review procedures provided documentation of the accuracy and precision of the analytical data and confirmed the analyses were sufficiently sensitive to detect analytes at levels below the Washington State Department of Ecology action levels or regulatory standards, where such standards exist. The laboratory analytical reports and completed Laboratory Data Review Checklist is enclosed with this appendix.

The following sections summarize the results of our QA/QC analytical data review and validation for samples collected during the stormwater sampling event. Only those issues that affected data quality (i.e., resulted in applying data qualifiers) are summarized herein. For additional details regarding QA/QC for each work order, refer to the Laboratory Data Review Checklist.

A.1 WATER SAMPLE DATA QUALITY

The stormwater samples were submitted to Eurofins Sacramento of West Sacramento, California, for analysis of per- and poly-fluoroalkyl substances (PFAS). We reviewed Eurofins' work order 320-106086-1 for this reporting period.

A.2 SAMPLE HANDLING

Stormwater samples collected by Shannon & Wilson were shipped via air to the West Sacramento laboratory to perform the requested analyses. The laboratory referenced the analytical method specified on the Chain-of-Custody (COC) record. The sample-receipt form was reviewed to verify samples were received in good condition and within the acceptable temperature range. The samples are considered within range if they are received free of ice and at temperatures between 0 degrees Celsius (°C) and 6 °C. Samples were received at the laboratory within temperature and free of ice.

Samples were received in good condition upon arrival at each location and noted to be properly preserved, where required. (No chemical preservative was required for these particular samples.) The COC record was also reviewed to confirm information was complete and custody was not breached. The COC record was complete and correct. Samples were submitted with sufficient time to conduct the analyses within the method hold time.

APPENDIX A: ANALYTICAL QUALITY ASSURANCE AND QUALITY CONTROL

A.3 ANALYTICAL SENSITIVITY AND BLANKS

Reporting limits for regulated analytes were below the potentially applicable screening levels shown in Table 2.

Laboratory method blanks (MBs) were analyzed in association with samples collected for this project to check for contributions to the analytical results possibly attributable to laboratory-based contamination. There were no blank detections in the MB samples.

A.4 ACCURACY

Laboratory analytical accuracy is assessed by evaluating laboratory control sample (LCS) and LCS duplicate (LCSD) results. The laboratory also reported a low level LCS sample for the samples. LCS/LCSD samples assess the accuracy of analytical procedures by checking the laboratory's ability to recover analytes added to clean aqueous matrices. Accuracy was also assessed for organic analyses by evaluating the recovery of analyte standards added to project samples. For PFAS results, the recovery of the isotope dilution analysis (IDA) standards were evaluated.

Recovery information was reviewed for each LCS, LCSD, LLCS, and IDA. Recoveries were within laboratory control limits for each preparatory batch.

A.5 PRECISION

A field duplicate sample was collected for the project sampling event to evaluate the precision of analytical measurements, as well as the reproducibility of the sampling technique. The relative percent difference (RPD; difference between the sample and its field duplicate divided by the mean of the two) was calculated to evaluate the precision of the data. An RPD was evaluated only if the results of the analyses for both duplicates were detected.

Results of RPD calculations for each of these duplicate-sample sets met the data quality objective (DQO) of 30 percent for water samples, where calculable for detected results.

Laboratory analytical precision can also be evaluated by laboratory RPD calculations using the LCS/LCSD and laboratory duplicate sample results. Results of RPD calculations for each of these duplicate samples met laboratory limits.

Based on a review of the data, the water results associated with the reporting period are considered precise.

A.6 DATA QUALITY SUMMARY

We consider the samples collected for this project to be representative of site conditions at the locations and times they were obtained. Based on the QA review, no samples were rejected as unusable due to QC failures. In general, the quality of the analytical data for this reporting period does not appear to have been compromised by analytical irregularities. We consider the results to be usable for the purposes of the project.

Laboratory Data Review Checklist

Completed By:

Reviewed by Justin Risley, EIT/ Validated by Kristen Freiburger, Senior Chemist

Title:

Engineering Staff

Date:

November 28, 2023

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins Environment Testing

Laboratory Report Number:

320-106086-1

Laboratory Report Date:

November 13, 2023

Report Name:

Madrona School

Project Number

22082-014

320-106086-1

Laboratory Report Date:

November 13, 2023

Report Name:

Madrona School

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did a WA State Ecology approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   The project samples were submitted to Eurofins Environment Testing of West Sacramento, California, a WA State Department of Ecology approved laboratory for the requested analyses (ID C581).

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses WA State Ecology approved?

   Yes☐ No☐ N/A☒ Comments:

   Project samples were not transferred to another laboratory.

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

   Sample preservation outside of temperature is not required for PFAS analysis.

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c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

The sample receipt form indicates the samples arrived in good condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

There were no discrepancies documented by the laboratory.

e. Data quality or usability affected?

Comments:

The data quality/usability is not affected.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☐ No☐ N/A☒ Comments:

There were no discrepancies, errors, or QC failures documented in the case narrative. They note the following regarding the sample observations:
Method 1633: The following samples in preparation batch 320-718223 were yellow in color prior to extraction. SDCB105-Comp (320-106086-4), SDCB205-Comp (320-106086-8) and SDCB-DRAIN-A-Comp (320-106086-12).

Method 1633: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-718223.

Method 1633: The following samples in preparation batch 320-718223 were light brown in color following extraction. SDCB105-Comp (320-106086-4), SDCB205-Comp (320-106086-8) and SDCB-DRAIN-A-Comp (320-106086-12).

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Laboratory Report Date:

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Method 1633: The following samples in preparation batch 320-718223 were centrifuged and decanted prior to extract with only the aqueous phase extracted. SDBB105-Comp (320-106086-4), SDCB205-Comp (320-106086-8) and SDCB-DRAIN-A-Comp (320-106086-12).

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

Corrective actions were not required. The laboratory revised the laboratory packet to provide the centrifuge information for review.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The data quality/usability is not affected.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☐ No☐ N/A☒ Comments:

Soils were not submitted with this work order.

d. Are the RLs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

e. Data quality or usability affected?

The data quality/usability is not affected.

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Laboratory Report Date:

November 13, 2023

Report Name:

Madrona School

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than RL or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

iii. If above RL or project specified objectives, what samples are affected?

Comments:

None; target analytes were not detected in the method blank samples.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No samples are affected; see above.

v. Data quality or usability affected?

Comments:

The data quality/usability is not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

An LCS/LCSD, an LLCS, and laboratory duplicate were reported for the PFAS preparatory batch.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals were not included in the work order.

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Report Name:

Madrona School

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate.

Yes☒ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

None; method accuracy and precision were demonstrated to be within acceptable limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

The samples were not affected by method recovery failures.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality/usability is not affected.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☒ N/A☐ Comments:

Insufficient sample volume was available to perform an MS/MSD.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals were not included in the work order.

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Laboratory Report Date:

November 13, 2023

Report Name:

Madrona School

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☐ No☐ N/A☒ Comments:

An MS/MSD was not performed. See Section 6.b for laboratory accuracy.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☐ No☐ N/A☒ Comments:

An MS/MSD was not performed. See Section 6.b for laboratory precision.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

None. An MS/MSD was not performed.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

The results do not require qualification; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality/usability is not affected.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☒ No☐ N/A☐ Comments:

IDAs were assessed for PFAS analysis.

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☒ No☐ N/A☐ Comments:

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iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

IDA recoveries were within laboratory control limits; therefore, data flags are not required.

iv. Data quality or usability affected?

Comments:

The data quality/usability is not affected.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☐ No☐ N/A☒ Comments:

Volatile analyses were not requested on this work order. A trip blank was not required.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC?

Yes☐ No☐ N/A☒ Comments:

A trip blank sample was not submitted with this work order.

iii. All results less than RL and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

A trip blank sample was not submitted with this work order.

iv. If above RL or project specified objectives, what samples are affected?

Comments:

A trip blank sample was not submitted with this work order.

v. Data quality or usability affected?

Comments:

The data quality/usability is not affected.

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Laboratory Report Date:

November 13, 2023

Report Name:

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f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples or required frequency for the project?

Yes☒ No☐ N/A☐ Comments:

Field duplicate pair *SDCB205-Comp* / *SDCB-DRAIN-A-Comp* was submitted to the laboratory.

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☒ No☐ N/A☐ Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality/usability is not affected.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

The samples were not collected with reusable equipment. An equipment blank was not required.

i. All results less than RLs and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

Equipment blank samples were not submitted with this work order.

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ii. If above RL or project specified objectives, what samples are affected?

Comments:

N/A; an equipment blank was not submitted for this work order.

iii. Data quality or usability affected?

Comments:

The data quality/usability is not affected.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☐ No☐ N/A☒ Comments:

Additional data flags and qualifiers are not required.

ANALYTICAL REPORT

PREPARED FOR

Attn: Paul VanHorne
Shannon & Wilson, Inc
400 N. 34th Suite 100
PO BOX 300303
Seattle, Washington 98103

Generated 12/1/2023 9:00:27 AM Revision 1

JOB DESCRIPTION

Madrona School

JOB NUMBER

320-106086-1

Eurofins Sacramento
880 Riverside Parkway
West Sacramento CA 95605

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northern California, LLC Project Manager.

Authorization

Generated
12/1/2023 9:00:27 AM
Revision 1

Authorized for release by
David Alltucker, Project Manager I
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(916)374-4383

Table of Contents

Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: Madrona School

Job ID: 320-106086-1

Qualifiers

LCMS

Qualifier	Qualifier Description
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

Job ID: 320-106086-1

Laboratory: Eurofins Sacramento

Narrative

Job Narrative
320-106086-1

Revision 12-1-2023: This report has been revised to add additional narrative comment about extraction of samples as well as a copy of the extraction batch paperwork with notes on sample extraction.

Receipt
The samples were received on 10/18/2023 9:05 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 1.5º C.

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

Organic Prep
Method 1633: The following samples in preparation batch 320-718223 were yellow in color prior to extraction. SDCB105-Comp (320-106086-4), SDCB205-Comp (320-106086-8) and SDCB-DRAIN-A-Comp (320-106086-12)

Method 1633: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-718223.

Method 1633: The following samples in preparation batch 320-718223 were light brown in color following extraction. SDCB105-Comp (320-106086-4), SDCB205-Comp (320-106086-8) and SDCB-DRAIN-A-Comp (320-106086-12)

Method 1633: The following samples in preparation batch 320-718223 were centrifuged and decanted prior to extract with only the aqueous phase extracted.. SDCB105-Comp (320-106086-4), SDCB205-Comp (320-106086-8) and SDCB-DRAIN-A-Comp (320-106086-12)

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

Box 972

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-718223
Method Code: 320-1633_SPE-320

Analyst: Stratford, Jordan

RUSH

Batch Open: 11/6/2023 12:08:00PM
Batch End: 11/6/2023 5:40:00PM

Solid-Phase Extraction (SPE)

Dilutions
Clogs

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-718223/1 N/A	N/A		500.0 mL 5.0 mL	7.0			N/A	N/A	N/A		MB 320-718223/1-A
2	LLCS~320-718223/2 N/A	N/A		500.0 mL 5.0 mL	7.0			N/A	N/A	N/A		LLCS 320-718223/2-A
3	LCS~320-718223/3 N/A	N/A		500.0 mL 5.0 mL	7.0			N/A	N/A	N/A		LCS 320-718223/3-A
4	LCSD~320-718223/4 N/A	N/A		500.0 mL 5.0 mL	7.0			N/A	N/A	N/A		LCSD 320-718223/4-A
5	460-290913-B-1 (1633)	N/A (460-290913-1)	599.41 g 46.07 g	553.3 mL 5.0 mL	6.5			11/16/23	19_Days	4		460-290913-B-1-A
6	460-290913-C-1~DU (1633)	N/A (460-290913-1)	601.58 g 46.15 g	555.4 mL 5.0 mL	6.5			11/16/23	19_Days	4		460-290913-C-1-A DU
7	460-290913-B-2 (1633)	N/A (460-290913-1)	601.18 g 46.1 g	555.1 mL 5.0 mL	6.5			11/16/23	19_Days	4	Clogged: Remaining sample + bottle = 170.23g	460-290913-B-2-A
8	460-290913-B-3 (1633)	N/A (460-290913-1)	604.75 g 46.00 g	558.8 mL 5.0 mL	6.5			11/16/23	19_Days	4		460-290913-B-3-A
9	460-290913-B-4 (1633)	N/A (460-290913-1)	605.27 g 46.1 g	559.2 mL 5.0 mL	6.5			11/16/23	19_Days	4	Clogged: Remaining sample + bottle = 102.50g	460-290913-B-4-A
10	460-290913-B-5 (1633)	N/A (460-290913-1)	595.31 g	549.2 mL	6.5			11/16/23	19_Days	4		460-290913-B-5-A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-718223 Analyst: Stratford, Jordan Batch Open: 11/6/2023 12:08:00PM

Method Code: 320-1633_SPE-320 Batch End: 11/6/2023 5:40:00PM

			46.07 g	5.0 mL							
11	460-290913-B-6 (1633)	N/A (460-290913-1)	617.69 g 47.85 g	569.8 mL 5.0 mL	6.5			11/16/23	19_Days	4	
12	460-290913-B-7 (1633)	N/A (460-290913-1)	607.52 g 45.96 g	561.6 mL 5.0 mL	6.5			11/16/23	19_Days	4	
13	460-290913-B-8 (1633)	N/A (460-290913-1)	611.77 g 46.15 g	565.6 mL 5.0 mL	6.5			11/16/23	19_Days	4	
14	460-290913-B-9 (1633)	N/A (460-290913-1)	599.09 g 48.28 g	550.8 mL 5.0 mL	6.5			11/16/23	19_Days	4	
15	460-290913-B-10 (1633)	N/A (460-290913-1)	615.21 g 46.1 g	569.1 mL 5.0 mL	6.5			11/16/23	19_Days	4	Clogged: Remaining sample + bottle = 265.53g
16	460-290393-C-29 (1633)	N/A (460-290393-1)		250.0 mL 5.0 mL	6.5			11/9/23	19_Days	4	A 2x dilution was created. Clogged: Remaining sample + bottle = 284.18g
17	460-290393-C-30 (1633)	N/A (460-290393-1)	609.92 g 46.98 g	562.9 mL 5.0 mL	6.5			11/9/23	19_Days	4	
18	460-290393-C-31 (1633)	N/A (460-290393-1)	613.36 g 47.94 g	565.4 mL 5.0 mL	6.5			11/9/23	19_Days	4	
19	460-290393-C-32 (1633)	N/A (460-290393-1)	600.93 g 46.1 g	554.8 mL 5.0 mL	6.5			11/9/23	19_Days	4	Clogged: Remaining sample + bottle = 127.37g
20	480-214229-A-1 (1633)	N/A (480-214229-1)		100.0 mL 5.0 mL	6.5			11/16/23	20_Day_Rush	2	A 5x dilution was created.

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-718223 Analyst: Stratford, Jordan Batch Open: 11/6/2023 12:08:00PM

Method Code: 320-1633_SPE-320 Batch End: 11/6/2023 5:40:00PM

21	480-214229-A-2 (1633)	N/A (480-214229-1)		100.0 mL 5.0 mL	6.5			11/16/23	20_Day_Rush	2	A 5x dilution was created.	
22	320-106086-A-4 (1633)	N/A (320-106086-1)		510.0 mL 5.0 mL	6.5			11/14/23	19_Days	2	Sample is a composite of samples -1, -2, -3, 170.0ml each	
23	320-106086-A-8 (1633)	N/A (320-106086-1)		510.0 mL 5.0 mL	6.5			11/14/23	19_Days	2	Sample is a composite of samples -5, -6, -7, 170.0ml each	
24	320-106086-A-12 (1633)	N/A (320-106086-1)		510.0 mL 5.0 mL	6.5			11/14/23	19_Days	2	Sample is a composite of samples -9, -10, -11, 170.0ml each	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-718223 Analyst: Stratford, Jordan Batch Open: 11/6/2023 12:08:00PM

Method Code: 320-1633_SPE-320 Batch End: 11/6/2023 5:40:00PM

Batch Notes

SPE Cartridge Conditioner #1 ID	3618380
SPE Cartridge Conditioner #2 ID	3635221
pH Indicator ID	Lab Rat Supplies pH Strips Lot: LRS-4801
Manifold ID	BN, BC
First Start time	11/06/2023 12:08
First End time	11/06/2023 17:40
SPE Reservoir ID #	NA
SPE Cartridge Type	Oasis WAX 6cc Cartridge 150 mg/30 um
SPE Cartridge Lot ID	022333086A
Extraction Filter ID #	NA
Balance ID	QA-081
Balance is Level? (Y/N)	yes
Pipette/Syringe/Dispenser ID	I33417H , J53014I , P78807J
Pipette Tip Lot ID	K199900Q , G175454P
Methanol ID	3634113
Sodium Hydroxide ID	NA
H2O ID	11/03/23
Solvent Name	1% NH4OH/MeOH
Solvent Lot #	3618380
Rinse Solvent Name	1:1 0.1M FA/MeOH
Rinse Solvent Lot	3594874

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-718223 Analyst: Stratford, Jordan Batch Open: 11/6/2023 12:08:00PM

Method Code: 320-1633_SPE-320 Batch End: 11/6/2023 5:40:00PM

Acid used for pH adjustment	NA
Acid Used for pH Adjustment ID	NA
Base used for pH adjustment	NA
Base Used to Adjust pH ID	NA
5% Formic Acid Reagent ID	NA
50% Formic Acid Reagent ID	NA
3% NH4OH Reagent ID	NA
30% NH4OH Reagent ID	NA
Acetic Acid ID	226258
Analyst ID - Reagent Drop	JS
Analyst ID - Reagent Drop Witness	RAC
Analyst ID - IS Reagent Drop	JS
Analyst ID - IS Reagent Drop Witness	RAC
Centrifuge Tube ID	220305058AA
QC Bottle Lot ID	0215001I
Glass Wool ID	147587
Carbon ID	160896
Filter ID	15720556A
Syringe ID	3122548
MeOH/MQH2O/NH4OH/AA	NA
ENVI-CARB Lot ID	160896
Medicine Cup Lot ID	NA
Beaker Lot ID	NA

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-718223 Analyst: Stratford, Jordan Batch Open: 11/6/2023 12:08:00PM

Method Code: 320-1633_SPE-320 Batch End: 11/6/2023 5:40:00PM

Pipette ID	NA
Vial Lot Number	#4112631920
Caps	NA
Rinse Methanol ID	NA
Batch Comment	Client labels match Eurofins labels: JS 11/06/2023. 0.3M Formic Acid 3635221; Hood D/FH 3-13

Comments

320-106086-A-4	Method Comments:	Composite samples 1,2,3 - centrifudge and decant- extract aq phase only
320-106086-A-8	Method Comments:	Composite samples 5,6,7 - centrifudge and decant- extract aq phase only
320-106086-A-12	Method Comments:	Composite samples 9,10,11 - centrifudge and decant- extract aq phase only

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-718223
Analyst: Stratford, Jordan
Batch Open: 11/6/2023 12:08:00PM
Method Code: 320-1633_SPE-320
Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-718223/1	LC1633_EIS_00050	625 uL	5.0 mL	JS 11/6/23	ZAC 11/6/23
MB 320-718223/1	LC1633_NIS_00036	62.5 uL	5.0 mL		
LLCS 320-718223/2	LC1633_EIS_00050	625 uL	5.0 mL		
LLCS 320-718223/2	LC1633_NIS_00036	62.5 uL	5.0 mL		
LLCS 320-718223/2	LC1633EPALSP_00027	100 uL	5.0 mL		
LCS 320-718223/3	LC1633_EIS_00050	625 uL	5.0 mL		
LCS 320-718223/3	LC1633_NIS_00036	62.5 uL	5.0 mL		
LCS 320-718223/3	LC1633EPALSP_00027	1000 uL	5.0 mL		
LCSD 320-718223/4	LC1633_EIS_00050	625 uL	5.0 mL		
LCSD 320-718223/4	LC1633_NIS_00036	62.5 uL	5.0 mL		
LCSD 320-718223/4	LC1633EPALSP_00027	1000 uL	5.0 mL		
460-290913-B-1	LC1633_EIS_00050	625 uL	5.0 mL		
460-290913-B-1	LC1633_NIS_00036	62.5 uL	5.0 mL		
460-290913-C-1 DU	LC1633_EIS_00050	625 uL	5.0 mL		
460-290913-C-1 DU	LC1633_NIS_00036	62.5 uL	5.0 mL		
460-290913-B-2	LC1633_EIS_00050	625 uL	5.0 mL		
460-290913-B-2	LC1633_NIS_00036	62.5 uL	5.0 mL		
460-290913-B-3	LC1633_EIS_00050	625 uL	5.0 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-718223 Analyst: Stratford, Jordan Batch Open: 11/6/2023 12:08:00PM

Method Code: 320-1633_SPE-320 Batch End:

460-290913-B-3	LC1633_NIS_00036	62.5 uL	5.0 mL	JS 11/6/23	EAC 11/6/23
460-290913-B-4	LC1633_EIS_00050	625 uL	5.0 mL		
460-290913-B-4	LC1633_NIS_00036	62.5 uL	5.0 mL		
460-290913-B-5	LC1633_EIS_00050	625 uL	5.0 mL		
460-290913-B-5	LC1633_NIS_00036	62.5 uL	5.0 mL		
460-290913-B-6	LC1633_EIS_00050	625 uL	5.0 mL		
460-290913-B-6	LC1633_NIS_00036	62.5 uL	5.0 mL		
460-290913-B-7	LC1633_EIS_00050	625 uL	5.0 mL		
460-290913-B-7	LC1633_NIS_00036	62.5 uL	5.0 mL		
460-290913-B-8	LC1633_EIS_00050	625 uL	5.0 mL		
460-290913-B-8	LC1633_NIS_00036	62.5 uL	5.0 mL		
460-290913-B-9	LC1633_EIS_00050	625 uL	5.0 mL		
460-290913-B-9	LC1633_NIS_00036	62.5 uL	5.0 mL		
460-290913-B-10	LC1633_EIS_00050	625 uL	5.0 mL		
460-290913-B-10	LC1633_NIS_00036	62.5 uL	5.0 mL		
460-290393-C-29	LC1633_EIS_00050	625 uL	5.0 mL		
460-290393-C-29	LC1633_NIS_00036	62.5 uL	5.0 mL		
460-290393-C-30	LC1633_EIS_00050	625 uL	5.0 mL		
460-290393-C-30	LC1633_NIS_00036	62.5 uL	5.0 mL		
460-290393-C-31	LC1633_EIS_00050	625 uL	5.0 mL		
460-290393-C-31	LC1633_NIS_00036	62.5 uL	5.0 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-718223 Analyst: Stratford, Jordan Batch Open: 11/6/2023 12:08:00PM

Method Code: 320-1633_SPE-320 Batch End:

460-290393-C-32	LC1633_EIS_00050	625 uL	5.0 mL	JS 11/6/23	RAC 11/6/23
460-290393-C-32	LC1633_NIS_00036	62.5 uL	5.0 mL		
480-214229-A-1	LC1633_EIS_00050	625 uL	5.0 mL		
480-214229-A-1	LC1633_NIS_00036	62.5 uL	5.0 mL		
480-214229-A-2	LC1633_EIS_00050	625 uL	5.0 mL		
480-214229-A-2	LC1633_NIS_00036	62.5 uL	5.0 mL		
320-106086-A-4	LC1633_EIS_00050	625 uL	5.0 mL		
320-106086-A-4	LC1633_NIS_00036	62.5 uL	5.0 mL		
320-106086-A-8	LC1633_EIS_00050	625 uL	5.0 mL		
320-106086-A-8	LC1633_NIS_00036	62.5 uL	5.0 mL		
320-106086-A-12	LC1633_EIS_00050	625 uL	5.0 mL		
320-106086-A-12	LC1633_NIS_00036	62.5 uL	5.0 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

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Eurofins Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s) 718223 Test 1633-SPE

Earliest Holding Time 11/9/23

Batch Information	1st Level Reviewer	2nd Level Reviewer
Date and time accurate and entered into TALS correctly	✓	✓
All necessary batch information complete and entered into TALS correctly		✓
BD, FV, and AL initials are transcribed into the batch comment	✓	✓
Sample List Tab	**1st Level Reviewer**	**2nd Level Reviewer**
Samples identified to the correct method	✓	✓
Holding time violation NCM filed	NA	NA
MS/MSD or MS/DU NCM filed	✓	✓
NCM for any anomalies filed	✓	✓
All NCMs include method code, matrix, and prep batch	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Batch contains no more than 20 live samples	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved		✓
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)	✓	✓
The pH is transcribed properly in TALS	✓	✓
All additional information is transcribed into TALS and is correct and raw data is attached	✓	✓
Comments/Observations are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and checked into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Internal Standard is added to the reagents	✓	✓
All units are correctly transcribed into TALS	✓	✓

1st Level Reviewer: [signature] Date: 11/6/23

2nd Level Reviewer: FX Date: 11/6/23

Comments:

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Madrona School

Job ID: 320-106086-1

Client Sample ID: SDCB105-Comp — Lab Sample ID: 320-106086-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	35		7.8	2.0	ng/L	1		Draft 1633	Total/NA
Perfluoropentanoic acid (PFPeA)	74		3.9	0.98	ng/L	1		Draft 1633	Total/NA
Perfluorohexanoic acid (PFHxA)	99		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluoroheptanoic acid (PFHpA)	17		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorooctanoic acid (PFOA)	22		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorononanoic acid (PFNA)	5.2		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorodecanoic acid (PFDA)	4.5		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorobutanesulfonic acid (PFBS)	4.2		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.1	J	2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorooctanesulfonic acid (PFOS)	8.2		2.0	0.49	ng/L	1		Draft 1633	Total/NA

Client Sample ID: SDCB205-Comp — Lab Sample ID: 320-106086-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	12		7.8	2.0	ng/L	1		Draft 1633	Total/NA
Perfluoropentanoic acid (PFPeA)	33		3.9	0.98	ng/L	1		Draft 1633	Total/NA
Perfluorohexanoic acid (PFHxA)	28		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.7		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorooctanoic acid (PFOA)	7.6		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorononanoic acid (PFNA)	2.2		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorodecanoic acid (PFDA)	1.4	J	2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorobutanesulfonic acid (PFBS)	3.4		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.1	J	2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.5		2.0	0.49	ng/L	1		Draft 1633	Total/NA

Client Sample ID: SDCB-DRAIN-A-Comp — Lab Sample ID: 320-106086-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	12		7.8	2.0	ng/L	1		Draft 1633	Total/NA
Perfluoropentanoic acid (PFPeA)	33		3.9	0.98	ng/L	1		Draft 1633	Total/NA
Perfluorohexanoic acid (PFHxA)	27		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.1		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorooctanoic acid (PFOA)	5.9		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorononanoic acid (PFNA)	2.2		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorodecanoic acid (PFDA)	1.5	J	2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorobutanesulfonic acid (PFBS)	3.7		2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.1	J	2.0	0.49	ng/L	1		Draft 1633	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.6		2.0	0.49	ng/L	1		Draft 1633	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Shannon & Wilson, Inc
Project/Site: Madrona School

Job ID: 320-106086-1

Client Sample ID: SDCB105-Comp
Date Collected: 10/16/23 00:00
Date Received: 10/18/23 09:05

Lab Sample ID: 320-106086-4
Matrix: Water

Method: EPA Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**35**		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluoropentanoic acid (PFPeA)	**74**		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorohexanoic acid (PFHxA)	**99**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluoroheptanoic acid (PFHpA)	**17**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorooctanoic acid (PFOA)	**22**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorononanoic acid (PFNA)	**5.2**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorodecanoic acid (PFDA)	**4.5**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorotridecanoic acid (PFTrDA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorotetradecanoic acid (PFTeDA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorobutanesulfonic acid (PFBS)	**4.2**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluoropentanesulfonic acid (PFPeS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorohexanesulfonic acid (PFHxS)	**1.1**	**J**	2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorooctanesulfonic acid (PFOS)	**8.2**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorononanesulfonic acid (PFNS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorododecanesulfonic acid (PFDoS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:36	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:36	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluorooctanesulfonamide (PFOSA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:36	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		20	4.9	ng/L		11/06/23 12:08	11/07/23 18:36	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:36	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 18:36	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 18:36	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:36	1

Client: Shannon & Wilson, Inc
Project/Site: Madrona School

Job ID: 320-106086-1

Client Sample ID: SDCB105-Comp
Date Collected: 10/16/23 00:00
Date Received: 10/18/23 09:05

Lab Sample ID: 320-106086-4
Matrix: Water

Method: EPA Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:36	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 18:36	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		9.8	2.5	ng/L		11/06/23 12:08	11/07/23 18:36	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		49	12	ng/L		11/06/23 12:08	11/07/23 18:36	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		49	12	ng/L		11/06/23 12:08	11/07/23 18:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*73.8*		*5 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C5 PFPeA	*80.7*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C5 PFHxA	*87.5*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C4 PFHpA	*82.7*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C8 PFOA	*76.5*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C9 PFNA	*60.2*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C6 PFDA	*79.9*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C7 PFUnA	*71.7*		*30 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C2 PFDoA	*53.4*		*10 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C2 PFTeDA	*31.9*		*10 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C3 PFBS	*77.0*		*40 - 135*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C3 PFHxS	*86.7*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C8 PFOS	*87.2*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C8 PFOSA	*71.2*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
d3-NMeFOSAA	*68.7*		*40 - 170*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
d5-NEtFOSAA	*77.4*		*25 - 135*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C2 4:2 FTS	*142*		*40 - 200*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C2 6:2 FTS	*112*		*40 - 200*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C2 8:2 FTS	*98.5*		*40 - 300*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
13C3 HFPO-DA	*84.6*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
d7-N-MeFOSE-M	*33.1*		*10 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
d5-NEtPFOSA	*41.3*		*10 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*
d3-NMePFOSA	*49.8*		*10 - 130*	*11/06/23 12:08*	*11/07/23 18:36*	*1*

Method: EPA Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		20	4.9	ng/L		11/06/23 12:08	11/09/23 02:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d9-N-EtFOSE-M	*39.3*		*10 - 130*	*11/06/23 12:08*	*11/09/23 02:18*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Madrona School

Job ID: 320-106086-1

Client Sample ID: SDCB205-Comp
Date Collected: 10/16/23 00:00
Date Received: 10/18/23 09:05

Lab Sample ID: 320-106086-8
Matrix: Water

Method: EPA Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**12**		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluoropentanoic acid (PFPeA)	**33**		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorohexanoic acid (PFHxA)	**28**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluoroheptanoic acid (PFHpA)	**5.7**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorooctanoic acid (PFOA)	**7.6**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorononanoic acid (PFNA)	**2.2**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorodecanoic acid (PFDA)	**1.4**	**J**	2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorotridecanoic acid (PFTrDA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorotetradecanoic acid (PFTeDA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorobutanesulfonic acid (PFBS)	**3.4**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluoropentanesulfonic acid (PFPeS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorohexanesulfonic acid (PFHxS)	**1.1**	**J**	2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorooctanesulfonic acid (PFOS)	**3.5**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorononanesulfonic acid (PFNS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorododecanesulfonic acid (PFDoS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:53	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:53	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluorooctanesulfonamide (PFOSA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 18:53	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		20	4.9	ng/L		11/06/23 12:08	11/07/23 18:53	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:53	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 18:53	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 18:53	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:53	1

Client: Shannon & Wilson, Inc
Project/Site: Madrona School

Job ID: 320-106086-1

Client Sample ID: SDCB205-Comp

Date Collected: 10/16/23 00:00
Date Received: 10/18/23 09:05

Lab Sample ID: 320-106086-8

Matrix: Water

Method: EPA Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 18:53	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 18:53	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		9.8	2.5	ng/L		11/06/23 12:08	11/07/23 18:53	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		49	12	ng/L		11/06/23 12:08	11/07/23 18:53	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		49	12	ng/L		11/06/23 12:08	11/07/23 18:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*76.0*		*5 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C5 PFPeA	*91.2*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C5 PFHxA	*101*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C4 PFHpA	*94.5*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C8 PFOA	*73.5*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C9 PFNA	*65.2*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C6 PFDA	*89.0*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C7 PFUnA	*79.3*		*30 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C2 PFDoA	*60.9*		*10 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C2 PFTeDA	*26.4*		*10 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C3 PFBS	*75.9*		*40 - 135*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C3 PFHxS	*89.7*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C8 PFOS	*90.5*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C8 PFOSA	*73.9*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
d3-NMeFOSAA	*73.0*		*40 - 170*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
d5-NEtFOSAA	*88.8*		*25 - 135*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C2 4:2 FTS	*154*		*40 - 200*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C2 6:2 FTS	*146*		*40 - 200*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C2 8:2 FTS	*143*		*40 - 300*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
13C3 HFPO-DA	*98.0*		*40 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
d7-N-MeFOSE-M	*38.9*		*10 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
d5-NEtPFOSA	*46.8*		*10 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*
d3-NMePFOSA	*48.0*		*10 - 130*	*11/06/23 12:08*	*11/07/23 18:53*	*1*

Method: EPA Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		20	4.9	ng/L		11/06/23 12:08	11/09/23 02:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d9-N-EtFOSE-M	*48.5*		*10 - 130*	*11/06/23 12:08*	*11/09/23 02:35*	*1*

Client Sample ID: SDCB-DRAIN-A-Comp
Date Collected: 10/16/23 00:00
Date Received: 10/18/23 09:05

Lab Sample ID: 320-106086-12
Matrix: Water

Method: EPA Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**12**		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluoropentanoic acid (PFPeA)	**33**		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorohexanoic acid (PFHxA)	**27**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluoroheptanoic acid (PFHpA)	**6.1**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorooctanoic acid (PFOA)	**5.9**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorononanoic acid (PFNA)	**2.2**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorodecanoic acid (PFDA)	**1.5**	**J**	2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorotridecanoic acid (PFTrDA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorotetradecanoic acid (PFTeDA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorobutanesulfonic acid (PFBS)	**3.7**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluoropentanesulfonic acid (PFPeS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorohexanesulfonic acid (PFHxS)	**1.1**	**J**	2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorooctanesulfonic acid (PFOS)	**3.6**		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorononanesulfonic acid (PFNS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorododecanesulfonic acid (PFDoS)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 19:10	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 19:10	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluorooctanesulfonamide (PFOSA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.49	ng/L		11/06/23 12:08	11/07/23 19:10	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		20	4.9	ng/L		11/06/23 12:08	11/07/23 19:10	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 19:10	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 19:10	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 19:10	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 19:10	1

Client Sample ID: SDCB-DRAIN-A-Comp
Date Collected: 10/16/23 00:00
Date Received: 10/18/23 09:05

Lab Sample ID: 320-106086-12
Matrix: Water

Method: EPA Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		7.8	2.0	ng/L		11/06/23 12:08	11/07/23 19:10	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		3.9	0.98	ng/L		11/06/23 12:08	11/07/23 19:10	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		9.8	2.5	ng/L		11/06/23 12:08	11/07/23 19:10	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		49	12	ng/L		11/06/23 12:08	11/07/23 19:10	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		49	12	ng/L		11/06/23 12:08	11/07/23 19:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*71.6*		*5 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C5 PFPeA	*90.2*		*40 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C5 PFHxA	*100*		*40 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C4 PFHpA	*91.6*		*40 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C8 PFOA	*78.1*		*40 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C9 PFNA	*69.4*		*40 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C6 PFDA	*81.0*		*40 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C7 PFUnA	*82.4*		*30 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C2 PFDoA	*63.6*		*10 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C2 PFTeDA	*30.6*		*10 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C3 PFBS	*70.4*		*40 - 135*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C3 PFHxS	*90.6*		*40 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C8 PFOS	*95.1*		*40 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C8 PFOSA	*76.5*		*40 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
d3-NMeFOSAA	*74.2*		*40 - 170*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
d5-NEtFOSAA	*93.1*		*25 - 135*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C2 4:2 FTS	*152*		*40 - 200*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C2 6:2 FTS	*144*		*40 - 200*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C2 8:2 FTS	*132*		*40 - 300*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
13C3 HFPO-DA	*89.4*		*40 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
d7-N-MeFOSE-M	*39.5*		*10 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
d5-NEtPFOSA	*47.5*		*10 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*
d3-NMePFOSA	*53.9*		*10 - 130*	*11/06/23 12:08*	*11/07/23 19:10*	*1*

Method: EPA Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		20	4.9	ng/L		11/06/23 12:08	11/09/23 02:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d9-N-EtFOSE-M	*49.3*		*10 - 130*	*11/06/23 12:08*	*11/09/23 02:51*	*1*

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Madrona School

Job ID: 320-106086-1

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFBA	PFPeA	13C5PHA	C4PFHA	C8PFOA	C9PFNA	C6PFDA	13C7PUA
Lab Sample ID	Client Sample ID	(5-130)	(40-130)	(40-130)	(40-130)	(40-130)	(40-130)	(40-130)	(30-130)
320-106086-4	SDCB105-Comp	73.8	80.7	87.5	82.7	76.5	60.2	79.9	71.7
320-106086-8	SDCB205-Comp	76.0	91.2	101	94.5	73.5	65.2	89.0	79.3
320-106086-12	SDCB-DRAIN-A-Comp	71.6	90.2	100	91.6	78.1	69.4	81.0	82.4
LCS 320-718223/3-A - RA	Lab Control Sample								
LCSD 320-718223/4-A - RA	Lab Control Sample Dup								
LLCS 320-718223/2-A - RA	Lab Control Sample								
MB 320-718223/1-A - RA	Method Blank								

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFDoA	PFTDA	C3PFBS	C3PFHS	C8PFOS	PFOSA	d3NMFOS	d5NEFOS
Lab Sample ID	Client Sample ID	(10-130)	(10-130)	(40-135)	(40-130)	(40-130)	(40-130)	(40-170)	(25-135)
320-106086-4	SDCB105-Comp	53.4	31.9	77.0	86.7	87.2	71.2	68.7	77.4
320-106086-8	SDCB205-Comp	60.9	26.4	75.9	89.7	90.5	73.9	73.0	88.8
320-106086-12	SDCB-DRAIN-A-Comp	63.6	30.6	70.4	90.6	95.1	76.5	74.2	93.1
LCS 320-718223/3-A - RA	Lab Control Sample	73.6	67.8						
LCSD 320-718223/4-A - RA	Lab Control Sample Dup	81.8	77.5						
LLCS 320-718223/2-A - RA	Lab Control Sample	77.0	71.8						
MB 320-718223/1-A - RA	Method Blank	76.7	80.9						

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		M242FTS	M262FTS	M282FTS	HFPODA	NMFM	d5NPFSA	d3NMFSA	
Lab Sample ID	Client Sample ID	(40-200)	(40-200)	(40-300)	(40-130)	(10-130)	(10-130)	(10-130)	
320-106086-4	SDCB105-Comp	142	112	98.5	84.6	33.1	41.3	49.8	
320-106086-8	SDCB205-Comp	154	146	143	98.0	38.9	46.8	48.0	
320-106086-12	SDCB-DRAIN-A-Comp	152	144	132	89.4	39.5	47.5	53.9	
LCS 320-718223/3-A - RA	Lab Control Sample					75.9			
LCSD 320-718223/4-A - RA	Lab Control Sample Dup					78.1			
LLCS 320-718223/2-A - RA	Lab Control Sample					74.3			
MB 320-718223/1-A - RA	Method Blank					74.7			

Surrogate Legend

PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
13C5PHA = 13C5 PFHxA
C4PFHA = 13C4 PFHpA
C8PFOA = 13C8 PFOA
C9PFNA = 13C9 PFNA
C6PFDA = 13C6 PFDA
13C7PUA = 13C7 PFUnA
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
C3PFHS = 13C3 PFHxS
C8PFOS = 13C8 PFOS
PFOSA = 13C8 PFOSA
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
M242FTS = 13C2 4:2 FTS
M262FTS = 13C2 6:2 FTS
M282FTS = 13C2 8:2 FTS
HFPODA = 13C3 HFPO-DA

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Madrona School

Job ID: 320-106086-1

NMFM = d7-N-MeFOSE-M
d5NPFSA = d5-NEtPFOSA
d3NMFSA = d3-NMePFOSA

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)
		NEFM
Lab Sample ID	Client Sample ID	(10-130)
320-106086-4 - RA	SDCB105-Comp	39.3
320-106086-8 - RA	SDCB205-Comp	48.5
320-106086-12 - RA	SDCB-DRAIN-A-Comp	49.3

Surrogate Legend

NEFM = d9-N-EtFOSE-M

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFBA	PFPeA	13C5PHA	C4PFHA	C8PFOA	C9PFNA	C6PFDA	13C7PUA
Lab Sample ID	Client Sample ID	(5-130)	(40-130)	(40-130)	(40-130)	(40-130)	(40-130)	(40-130)	(30-130)
460-290913-C-1-A DU	Duplicate	89.3	104	98.8	85.7	78.8	66.6	78.9	72.2
LCS 320-718223/3-A	Lab Control Sample	88.3	113	106	93.5	80.4	63.8	89.4	80.7
LCSD 320-718223/4-A	Lab Control Sample Dup	86.0	106	94.0	88.5	79.2	66.5	87.5	77.8
LLCS 320-718223/2-A	Lab Control Sample	84.5	102	99.7	93.8	83.5	67.3	90.5	87.4
MB 320-718223/1-A	Method Blank	87.1	106	97.5	85.8	77.1	63.5	86.2	90.2

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFDoA	C3PFBS	C3PFHS	C8PFOS	PFOSA	d3NMFOS	d5NEFOS	M242FTS
Lab Sample ID	Client Sample ID	(10-130)	(40-135)	(40-130)	(40-130)	(40-130)	(40-170)	(25-135)	(40-200)
460-290913-C-1-A DU	Duplicate	61.8	77.9	93.7	82.8	67.8	71.9	77.5	102
LCS 320-718223/3-A	Lab Control Sample	81.4	72.1	84.6	97.1	71.2	89.1	99.0	88.0
LCSD 320-718223/4-A	Lab Control Sample Dup	73.6	73.8	89.1	99.4	70.5	87.2	90.8	93.2
LLCS 320-718223/2-A	Lab Control Sample	75.9	78.4	83.6	91.1	67.2	85.7	92.8	102
MB 320-718223/1-A	Method Blank	77.8	72.8	80.0	87.8	67.5	84.7	84.6	86.6

		Percent Isotope Dilution Recovery (Acceptance Limits)					
		M262FTS	M282FTS	HFPODA	NEFM	d5NPFSA	d3NMFSA
Lab Sample ID	Client Sample ID	(40-200)	(40-300)	(40-130)	(10-130)	(10-130)	(10-130)
460-290913-C-1-A DU	Duplicate	84.6	106	93.1	43.5	45.6	47.6
LCS 320-718223/3-A	Lab Control Sample	78.7	105	99.4	50.6	53.2	53.8
LCSD 320-718223/4-A	Lab Control Sample Dup	83.7	111	93.5	54.8	61.7	59.5
LLCS 320-718223/2-A	Lab Control Sample	89.5	113	88.7	54.3	56.8	51.8
MB 320-718223/1-A	Method Blank	87.0	125	88.3	52.0	50.7	49.7

Surrogate Legend

PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
13C5PHA = 13C5 PFHxA
C4PFHA = 13C4 PFHpA
C8PFOA = 13C8 PFOA
C9PFNA = 13C9 PFNA
C6PFDA = 13C6 PFDA
13C7PUA = 13C7 PFUnA
PFDoA = 13C2 PFDoA
C3PFBS = 13C3 PFBS
C3PFHS = 13C3 PFHxS

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Madrona School

Job ID: 320-106086-1

C8PFOS = 13C8 PFOS
PFOSA = 13C8 PFOSA
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
M242FTS = 13C2 4:2 FTS
M262FTS = 13C2 6:2 FTS
M282FTS = 13C2 8:2 FTS
HFPODA = 13C3 HFPO-DA
NEFM = d9-N-EtFOSE-M
d5NPFSA = d5-NEtPFOSA
d3NMFSA = d3-NMePFOSA

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Lab Sample ID: MB 320-718223/1-A
Matrix: Water
Analysis Batch: 718433

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 718223

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		8.0	2.0	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluoropentanoic acid (PFPeA)	ND		4.0	1.0	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluoropentanesulfonic acid (PFPeS)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluorononanesulfonic acid (PFNS)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluorododecanesulfonic acid (PFDoS)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		8.0	2.0	ng/L		11/06/23 12:08	11/07/23 11:07	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		8.0	2.0	ng/L		11/06/23 12:08	11/07/23 11:07	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		8.0	2.0	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluorooctanesulfonamide (PFOSA)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.50	ng/L		11/06/23 12:08	11/07/23 11:07	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		20	5.0	ng/L		11/06/23 12:08	11/07/23 11:07	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		8.0	2.0	ng/L		11/06/23 12:08	11/07/23 11:07	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		8.0	2.0	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		4.0	1.0	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		4.0	1.0	ng/L		11/06/23 12:08	11/07/23 11:07	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		4.0	1.0	ng/L		11/06/23 12:08	11/07/23 11:07	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		8.0	2.0	ng/L		11/06/23 12:08	11/07/23 11:07	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		8.0	2.0	ng/L		11/06/23 12:08	11/07/23 11:07	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		4.0	1.0	ng/L		11/06/23 12:08	11/07/23 11:07	1

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: MB 320-718223/1-A
Matrix: Water
Analysis Batch: 718433

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 718223

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		10	2.5	ng/L		11/06/23 12:08	11/07/23 11:07	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		50	13	ng/L		11/06/23 12:08	11/07/23 11:07	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		50	13	ng/L		11/06/23 12:08	11/07/23 11:07	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*87.1*		*5 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C5 PFPeA	*106*		*40 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C5 PFHxA	*97.5*		*40 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C4 PFHpA	*85.8*		*40 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C8 PFOA	*77.1*		*40 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C9 PFNA	*63.5*		*40 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C6 PFDA	*86.2*		*40 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C7 PFUnA	*90.2*		*30 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C2 PFDoA	*77.8*		*10 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C3 PFBS	*72.8*		*40 - 135*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C3 PFHxS	*80.0*		*40 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C8 PFOS	*87.8*		*40 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C8 PFOSA	*67.5*		*40 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
d3-NMeFOSAA	*84.7*		*40 - 170*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
d5-NEtFOSAA	*84.6*		*25 - 135*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C2 4:2 FTS	*86.6*		*40 - 200*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C2 6:2 FTS	*87.0*		*40 - 200*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C2 8:2 FTS	*125*		*40 - 300*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
13C3 HFPO-DA	*88.3*		*40 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
d9-N-EtFOSE-M	*52.0*		*10 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
d5-NEtPFOSA	*50.7*		*10 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*
d3-NMePFOSA	*49.7*		*10 - 130*	*11/06/23 12:08*	*11/07/23 11:07*	*1*

Lab Sample ID: LCS 320-718223/3-A
Matrix: Water
Analysis Batch: 718433

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 718223

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	128	112		ng/L		88	70 - 140
Perfluoropentanoic acid (PFPeA)	64.0	54.0		ng/L		84	65 - 135
Perfluorohexanoic acid (PFHxA)	32.0	29.2		ng/L		91	70 - 145
Perfluoroheptanoic acid (PFHpA)	32.0	29.2		ng/L		91	70 - 150
Perfluorooctanoic acid (PFOA)	32.0	28.1		ng/L		88	70 - 150
Perfluorononanoic acid (PFNA)	32.0	31.7		ng/L		99	70 - 150
Perfluorodecanoic acid (PFDA)	32.0	28.2		ng/L		88	70 - 140
Perfluoroundecanoic acid (PFUnA)	32.0	31.2		ng/L		98	70 - 145
Perfluorododecanoic acid (PFDoA)	32.0	30.3		ng/L		95	70 - 140
Perfluorobutanesulfonic acid (PFBS)	28.4	24.8		ng/L		87	60 - 145
Perfluoropentanesulfonic acid (PFPeS)	30.1	22.0		ng/L		73	65 - 140

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LCS 320-718223/3-A
Matrix: Water
Analysis Batch: 718433

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 718223

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanesulfonic acid (PFHxS)	29.2	27.5		ng/L		94	65 - 145
Perfluoroheptanesulfonic acid (PFHpS)	30.5	25.4		ng/L		83	70 - 150
Perfluorooctanesulfonic acid (PFOS)	29.8	25.3		ng/L		85	55 - 150
Perfluorononanesulfonic acid (PFNS)	30.8	24.7		ng/L		80	65 - 145
Perfluorodecanesulfonic acid (PFDS)	30.8	23.8		ng/L		77	60 - 145
Perfluorododecanesulfonic acid (PFDoS)	31.0	20.0		ng/L		65	50 - 145
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	120	102		ng/L		85	70 - 145
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	122	130		ng/L		107	65 - 155
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	123	113		ng/L		92	60 - 150
Perfluorooctanesulfonamide (PFOSA)	32.0	32.3		ng/L		101	70 - 145
N-methylperfluorooctane sulfonamide (NMeFOSA)	32.0	28.2		ng/L		88	60 - 150
N-ethylperfluorooctane sulfonamide (NEtFOSA)	32.0	29.2		ng/L		91	65 - 145
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	32.0	25.0		ng/L		78	50 - 140
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	32.0	32.9		ng/L		103	70 - 145
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	320	335		ng/L		105	70 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	128	118		ng/L		93	70 - 140
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	121	109		ng/L		90	65 - 145
Perfluoro-3-methoxypropanoic acid (PFMPA)	64.0	54.0		ng/L		84	55 - 140
Perfluoro-4-methoxybutanoic acid (PFMBA)	64.0	48.8		ng/L		76	60 - 150
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	64.0	54.3		ng/L		85	50 - 150
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	120	106		ng/L		89	70 - 155
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	121	108		ng/L		89	55 - 160
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	57.1	50.9		ng/L		89	70 - 140
3-Perfluoropropylpropanoic acid (3:3 FTCA)	160	117		ng/L		73	65 - 130
3-Perfluoropentylpropanoic acid (5:3 FTCA)	799	661		ng/L		83	70 - 135
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	799	618		ng/L		77	50 - 145

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFBA	88.3		5 - 130
13C5 PFPeA	113		40 - 130
13C5 PFHxA	106		40 - 130
13C4 PFHpA	93.5		40 - 130
13C8 PFOA	80.4		40 - 130
13C9 PFNA	63.8		40 - 130
13C6 PFDA	89.4		40 - 130
13C7 PFUnA	80.7		30 - 130
13C2 PFDoA	81.4		10 - 130
13C3 PFBS	72.1		40 - 135
13C3 PFHxS	84.6		40 - 130
13C8 PFOS	97.1		40 - 130
13C8 PFOSA	71.2		40 - 130
d3-NMeFOSAA	89.1		40 - 170
d5-NEtFOSAA	99.0		25 - 135
13C2 4:2 FTS	88.0		40 - 200
13C2 6:2 FTS	78.7		40 - 200
13C2 8:2 FTS	105		40 - 300
13C3 HFPO-DA	99.4		40 - 130
d9-N-EtFOSE-M	50.6		10 - 130
d5-NEtPFOSA	53.2		10 - 130
d3-NMePFOSA	53.8		10 - 130

Lab Sample ID: LCSD 320-718223/4-A
Matrix: Water
Analysis Batch: 718433

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 718223

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)			128	119		ng/L		93	70 - 140	6	30
Perfluoropentanoic acid (PFPeA)			64.0	58.1		ng/L		91	65 - 135	7	30
Perfluorohexanoic acid (PFHxA)			32.0	30.3		ng/L		95	70 - 145	4	30
Perfluoroheptanoic acid (PFHpA)			32.0	32.0		ng/L		100	70 - 150	9	30
Perfluorooctanoic acid (PFOA)			32.0	30.0		ng/L		94	70 - 150	6	30
Perfluorononanoic acid (PFNA)			32.0	35.9		ng/L		112	70 - 150	12	30
Perfluorodecanoic acid (PFDA)			32.0	30.9		ng/L		96	70 - 140	9	30
Perfluoroundecanoic acid (PFUnA)			32.0	32.4		ng/L		101	70 - 145	4	30
Perfluorododecanoic acid (PFDoA)			32.0	32.8		ng/L		102	70 - 140	8	30
Perfluorobutanesulfonic acid (PFBS)			28.4	28.0		ng/L		98	60 - 145	12	30
Perfluoropentanesulfonic acid (PFPeS)			30.1	23.6		ng/L		78	65 - 140	7	30
Perfluorohexanesulfonic acid (PFHxS)			29.2	25.4		ng/L		87	65 - 145	8	30
Perfluoroheptanesulfonic acid (PFHpS)			30.5	25.6		ng/L		84	70 - 150	1	30
Perfluorooctanesulfonic acid (PFOS)			29.8	25.6		ng/L		86	55 - 150	1	30
Perfluorononanesulfonic acid (PFNS)			30.8	26.0		ng/L		85	65 - 145	5	30
Perfluorodecanesulfonic acid (PFDS)			30.8	24.6		ng/L		80	60 - 145	3	30

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LCSD 320-718223/4-A
Matrix: Water
Analysis Batch: 718433

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 718223

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorododecanesulfonic acid (PFDoS)			31.0	21.0		ng/L		68	50 - 145	5	30
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)			120	98.4		ng/L		82	70 - 145	4	30
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)			122	132		ng/L		109	65 - 155	2	30
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)			123	118		ng/L		96	60 - 150	4	30
Perfluorooctanesulfonamide (PFOSA)			32.0	31.3		ng/L		98	70 - 145	3	30
N-methylperfluorooctane sulfonamide (NMeFOSA)			32.0	30.7		ng/L		96	60 - 150	8	30
N-ethylperfluorooctane sulfonamide (NEtFOSA)			32.0	31.1		ng/L		97	65 - 145	6	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)			32.0	29.0		ng/L		91	50 - 140	15	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)			32.0	36.3		ng/L		113	70 - 145	10	30
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)			320	332		ng/L		104	70 - 135	1	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)			128	127		ng/L		99	70 - 140	7	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			121	116		ng/L		96	65 - 145	6	30
Perfluoro-3-methoxypropanoic acid (PFMPA)			64.0	55.8		ng/L		87	55 - 140	3	30
Perfluoro-4-methoxybutanoic acid (PFMBA)			64.0	51.5		ng/L		80	60 - 150	5	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)			64.0	50.4		ng/L		79	50 - 150	7	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)			120	114		ng/L		95	70 - 155	7	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)			121	111		ng/L		92	55 - 160	3	30
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)			57.1	57.9		ng/L		101	70 - 140	13	30
3-Perfluoropropylpropanoic acid (3:3 FTCA)			160	123		ng/L		77	65 - 130	5	30
3-Perfluoropentylpropanoic acid (5:3 FTCA)			799	710		ng/L		89	70 - 135	7	30
3-Perfluoroheptylpropanoic acid (7:3 FTCA)			799	726		ng/L		91	50 - 145	16	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C4 PFBA	*86.0*		*5 - 130*
13C5 PFPeA	*106*		*40 - 130*
13C5 PFHxA	*94.0*		*40 - 130*
13C4 PFHpA	*88.5*		*40 - 130*
13C8 PFOA	*79.2*		*40 - 130*
13C9 PFNA	*66.5*		*40 - 130*
13C6 PFDA	*87.5*		*40 - 130*
13C7 PFUnA	*77.8*		*30 - 130*

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LCSD 320-718223/4-A
Matrix: Water
Analysis Batch: 718433

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 718223

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFDoA	*73.6*		*10 - 130*
13C3 PFBS	*73.8*		*40 - 135*
13C3 PFHxS	*89.1*		*40 - 130*
13C8 PFOS	*99.4*		*40 - 130*
13C8 PFOSA	*70.5*		*40 - 130*
d3-NMeFOSAA	*87.2*		*40 - 170*
d5-NEtFOSAA	*90.8*		*25 - 135*
13C2 4:2 FTS	*93.2*		*40 - 200*
13C2 6:2 FTS	*83.7*		*40 - 200*
13C2 8:2 FTS	*111*		*40 - 300*
13C3 HFPO-DA	*93.5*		*40 - 130*
d9-N-EtFOSE-M	*54.8*		*10 - 130*
d5-NEtPFOSA	*61.7*		*10 - 130*
d3-NMePFOSA	*59.5*		*10 - 130*

Lab Sample ID: LLCS 320-718223/2-A
Matrix: Water
Analysis Batch: 718433

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 718223

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	12.8	10.9		ng/L		86	70 - 140
Perfluoropentanoic acid (PFPeA)	6.40	5.46		ng/L		85	65 - 135
Perfluorohexanoic acid (PFHxA)	3.20	2.52		ng/L		79	70 - 145
Perfluoroheptanoic acid (PFHpA)	3.20	2.39		ng/L		75	70 - 150
Perfluorooctanoic acid (PFOA)	3.20	2.67		ng/L		83	70 - 150
Perfluorononanoic acid (PFNA)	3.20	2.70		ng/L		85	70 - 150
Perfluorodecanoic acid (PFDA)	3.20	3.07		ng/L		96	70 - 140
Perfluoroundecanoic acid (PFUnA)	3.20	2.92		ng/L		91	70 - 145
Perfluorododecanoic acid (PFDoA)	3.20	3.38		ng/L		105	70 - 140
Perfluorobutanesulfonic acid (PFBS)	2.84	2.09		ng/L		73	60 - 145
Perfluoropentanesulfonic acid (PFPeS)	3.01	2.37		ng/L		79	65 - 140
Perfluorohexanesulfonic acid (PFHxS)	2.92	2.67		ng/L		91	65 - 145
Perfluoroheptanesulfonic acid (PFHpS)	3.05	2.46		ng/L		81	70 - 150
Perfluorooctanesulfonic acid (PFOS)	2.98	2.38		ng/L		80	55 - 150
Perfluorononanesulfonic acid (PFNS)	3.08	2.56		ng/L		83	65 - 145
Perfluorodecanesulfonic acid (PFDS)	3.08	2.42		ng/L		78	60 - 145
Perfluorododecanesulfonic acid (PFDoS)	3.10	1.85	J	ng/L		60	50 - 145
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	12.0	10.1		ng/L		84	70 - 145
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	12.2	12.6		ng/L		104	65 - 155

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LLCS 320-718223/2-A
Matrix: Water
Analysis Batch: 718433

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 718223

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	12.3	10.1		ng/L		82	60 - 150
Perfluorooctanesulfonamide (PFOSA)	3.20	2.92		ng/L		91	70 - 145
N-methylperfluorooctane sulfonamide (NMeFOSA)	3.20	2.58		ng/L		81	60 - 150
N-ethylperfluorooctane sulfonamide (NEtFOSA)	3.20	2.48		ng/L		77	65 - 145
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	3.20	2.74		ng/L		86	50 - 140
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	3.20	3.09		ng/L		97	70 - 145
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	32.0	29.9		ng/L		94	70 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	12.8	11.2		ng/L		88	70 - 140
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	12.1	11.0		ng/L		91	65 - 145
Perfluoro-3-methoxypropanoic acid (PFMPA)	6.40	5.39		ng/L		84	55 - 140
Perfluoro-4-methoxybutanoic acid (PFMBA)	6.40	5.24		ng/L		82	60 - 150
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	6.40	4.16		ng/L		65	50 - 150
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	12.0	10.6		ng/L		89	70 - 155
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	12.1	9.81		ng/L		81	55 - 160
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	5.71	5.00		ng/L		88	70 - 140
3-Perfluoropropylpropanoic acid (3:3 FTCA)	16.0	11.9		ng/L		75	65 - 130
3-Perfluoropentylpropanoic acid (5:3 FTCA)	79.9	61.3		ng/L		77	70 - 135
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	79.9	58.1		ng/L		73	50 - 145

Isotope Dilution	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C4 PFBA	*84.5*		*5 - 130*
13C5 PFPeA	*102*		*40 - 130*
13C5 PFHxA	*99.7*		*40 - 130*
13C4 PFHpA	*93.8*		*40 - 130*
13C8 PFOA	*83.5*		*40 - 130*
13C9 PFNA	*67.3*		*40 - 130*
13C6 PFDA	*90.5*		*40 - 130*
13C7 PFUnA	*87.4*		*30 - 130*
13C2 PFDoA	*75.9*		*10 - 130*
13C3 PFBS	*78.4*		*40 - 135*
13C3 PFHxS	*83.6*		*40 - 130*
13C8 PFOS	*91.1*		*40 - 130*
13C8 PFOSA	*67.2*		*40 - 130*

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LLCS 320-718223/2-A
Matrix: Water
Analysis Batch: 718433

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 718223

Isotope Dilution	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
d3-NMeFOSAA	*85.7*		*40 - 170*
d5-NEtFOSAA	*92.8*		*25 - 135*
13C2 4:2 FTS	*102*		*40 - 200*
13C2 6:2 FTS	*89.5*		*40 - 200*
13C2 8:2 FTS	*113*		*40 - 300*
13C3 HFPO-DA	*88.7*		*40 - 130*
d9-N-EtFOSE-M	*54.3*		*10 - 130*
d5-NEtPFOSA	*56.8*		*10 - 130*
d3-NMePFOSA	*51.8*		*10 - 130*

Lab Sample ID: 460-290913-C-1-A DU
Matrix: Water
Analysis Batch: 718433

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 718223

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	ND			ND		ng/L				NC	20
Perfluoropentanoic acid (PFPeA)	ND			ND		ng/L				NC	20
Perfluorohexanoic acid (PFHxA)	ND			ND		ng/L				NC	20
Perfluoroheptanoic acid (PFHpA)	ND			ND		ng/L				NC	20
Perfluorooctanoic acid (PFOA)	ND			ND		ng/L				NC	20
Perfluorononanoic acid (PFNA)	ND			ND		ng/L				NC	20
Perfluorodecanoic acid (PFDA)	ND			ND		ng/L				NC	20
Perfluoroundecanoic acid (PFUnA)	ND			ND		ng/L				NC	20
Perfluorododecanoic acid (PFDoA)	ND			ND		ng/L				NC	20
Perfluorobutanesulfonic acid (PFBS)	ND			ND		ng/L				NC	20
Perfluoropentanesulfonic acid (PFPeS)	ND			ND		ng/L				NC	20
Perfluorohexanesulfonic acid (PFHxS)	ND			ND		ng/L				NC	20
Perfluoroheptanesulfonic acid (PFHpS)	ND			ND		ng/L				NC	20
Perfluorooctanesulfonic acid (PFOS)	ND			ND		ng/L				NC	20
Perfluorononanesulfonic acid (PFNS)	ND			ND		ng/L				NC	20
Perfluorodecanesulfonic acid (PFDS)	ND			ND		ng/L				NC	20
Perfluorododecanesulfonic acid (PFDoS)	ND			ND		ng/L				NC	20
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND			ND		ng/L				NC	20
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND			ND		ng/L				NC	20
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND			ND		ng/L				NC	20
Perfluorooctanesulfonamide (PFOSA)	ND			ND		ng/L				NC	20
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND			ND		ng/L				NC	20

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: 460-290913-C-1-A DU
Matrix: Water
Analysis Batch: 718433

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 718223

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND			ND		ng/L				NC	20
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND			ND		ng/L				NC	20
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND			ND		ng/L				NC	20
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND			ND		ng/L				NC	20
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND			ND		ng/L				NC	20
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND			ND		ng/L				NC	20
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND			ND		ng/L				NC	20
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND			ND		ng/L				NC	20
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND			ND		ng/L				NC	20
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND			ND		ng/L				NC	20
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND			ND		ng/L				NC	20
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND			ND		ng/L				NC	20
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND			ND		ng/L				NC	20
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND			ND		ng/L				NC	20
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND			ND		ng/L				NC	20

Isotope Dilution	*DU %Recovery*	*DU Qualifier*	*Limits*
13C4 PFBA	*89.3*		*5 - 130*
13C5 PFPeA	*104*		*40 - 130*
13C5 PFHxA	*98.8*		*40 - 130*
13C4 PFHpA	*85.7*		*40 - 130*
13C8 PFOA	*78.8*		*40 - 130*
13C9 PFNA	*66.6*		*40 - 130*
13C6 PFDA	*78.9*		*40 - 130*
13C7 PFUnA	*72.2*		*30 - 130*
13C2 PFDoA	*61.8*		*10 - 130*
13C3 PFBS	*77.9*		*40 - 135*
13C3 PFHxS	*93.7*		*40 - 130*
13C8 PFOS	*82.8*		*40 - 130*
13C8 PFOSA	*67.8*		*40 - 130*
d3-NMeFOSAA	*71.9*		*40 - 170*
d5-NEtFOSAA	*77.5*		*25 - 135*
13C2 4:2 FTS	*102*		*40 - 200*
13C2 6:2 FTS	*84.6*		*40 - 200*
13C2 8:2 FTS	*106*		*40 - 300*
13C3 HFPO-DA	*93.1*		*40 - 130*

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: 460-290913-C-1-A DU
Matrix: Water
Analysis Batch: 718433

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 718223

Isotope Dilution	DU %Recovery	DU Qualifier	Limits
d9-N-EtFOSE-M	43.5		10 - 130
d5-NEtPFOSA	45.6		10 - 130
d3-NMePFOSA	47.6		10 - 130

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS - RA

Lab Sample ID: MB 320-718223/1-A
Matrix: Water
Analysis Batch: 718935

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 718223

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotridecanoic acid (PFTrDA) - RA	ND		2.0	0.50	ng/L		11/06/23 12:08	11/08/23 19:23	1
Perfluorotetradecanoic acid (PFTeDA) - RA	ND		2.0	0.50	ng/L		11/06/23 12:08	11/08/23 19:23	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE) - RA	ND		20	5.0	ng/L		11/06/23 12:08	11/08/23 19:23	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA - RA	76.7		10 - 130	11/06/23 12:08	11/08/23 19:23	1
13C2 PFTeDA - RA	80.9		10 - 130	11/06/23 12:08	11/08/23 19:23	1
d7-N-MeFOSE-M - RA	74.7		10 - 130	11/06/23 12:08	11/08/23 19:23	1

Lab Sample ID: LCS 320-718223/3-A
Matrix: Water
Analysis Batch: 718935

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 718223

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorotridecanoic acid (PFTrDA) - RA	32.0	33.5		ng/L		105	65 - 140
Perfluorotetradecanoic acid (PFTeDA) - RA	32.0	35.5		ng/L		111	60 - 140
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE) - RA	320	322		ng/L		101	70 - 145

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C2 PFDoA - RA	73.6		10 - 130
13C2 PFTeDA - RA	67.8		10 - 130
d7-N-MeFOSE-M - RA	75.9		10 - 130

Lab Sample ID: LCSD 320-718223/4-A
Matrix: Water
Analysis Batch: 718935

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 718223

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorotridecanoic acid (PFTrDA) - RA	32.0	31.6		ng/L		99	65 - 140	6	30
Perfluorotetradecanoic acid (PFTeDA) - RA	32.0	34.8		ng/L		109	60 - 140	2	30

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS - RA (Continued)

Lab Sample ID: LCSD 320-718223/4-A
Matrix: Water
Analysis Batch: 718935

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 718223

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE) - RA			320	334		ng/L		104	70 - 145	4	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFDoA - RA	*81.8*		*10 - 130*
13C2 PFTeDA - RA	*77.5*		*10 - 130*
d7-N-MeFOSE-M - RA	*78.1*		*10 - 130*

Lab Sample ID: LLCS 320-718223/2-A
Matrix: Water
Analysis Batch: 718935

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 718223

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits		
Perfluorotridecanoic acid (PFTrDA) - RA			3.20	2.92		ng/L		91	65 - 140		
Perfluorotetradecanoic acid (PFTeDA) - RA			3.20	3.03		ng/L		95	60 - 140		
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE) - RA			32.0	27.4		ng/L		86	70 - 145		

Isotope Dilution	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C2 PFDoA - RA	*77.0*		*10 - 130*
13C2 PFTeDA - RA	*71.8*		*10 - 130*
d7-N-MeFOSE-M - RA	*74.3*		*10 - 130*

LCMS

Prep Batch: 718223

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-106086-4	SDCB105-Comp	Total/NA	Water	1633	
320-106086-4 - RA	SDCB105-Comp	Total/NA	Water	1633	
320-106086-8	SDCB205-Comp	Total/NA	Water	1633	
320-106086-8 - RA	SDCB205-Comp	Total/NA	Water	1633	
320-106086-12	SDCB-DRAIN-A-Comp	Total/NA	Water	1633	
320-106086-12 - RA	SDCB-DRAIN-A-Comp	Total/NA	Water	1633	
MB 320-718223/1-A	Method Blank	Total/NA	Water	1633	
MB 320-718223/1-A - RA	Method Blank	Total/NA	Water	1633	
LCS 320-718223/3-A	Lab Control Sample	Total/NA	Water	1633	
LCS 320-718223/3-A - RA	Lab Control Sample	Total/NA	Water	1633	
LCSD 320-718223/4-A	Lab Control Sample Dup	Total/NA	Water	1633	
LCSD 320-718223/4-A - RA	Lab Control Sample Dup	Total/NA	Water	1633	
LLCS 320-718223/2-A	Lab Control Sample	Total/NA	Water	1633	
LLCS 320-718223/2-A - RA	Lab Control Sample	Total/NA	Water	1633	
460-290913-C-1-A DU	Duplicate	Total/NA	Water	1633	

Analysis Batch: 718433

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-106086-4	SDCB105-Comp	Total/NA	Water	Draft 1633	718223
320-106086-8	SDCB205-Comp	Total/NA	Water	Draft 1633	718223
320-106086-12	SDCB-DRAIN-A-Comp	Total/NA	Water	Draft 1633	718223
MB 320-718223/1-A	Method Blank	Total/NA	Water	Draft 1633	718223
LCS 320-718223/3-A	Lab Control Sample	Total/NA	Water	Draft 1633	718223
LCSD 320-718223/4-A	Lab Control Sample Dup	Total/NA	Water	Draft 1633	718223
LLCS 320-718223/2-A	Lab Control Sample	Total/NA	Water	Draft 1633	718223
460-290913-C-1-A DU	Duplicate	Total/NA	Water	Draft 1633	718223

Analysis Batch: 718935

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-106086-4 - RA	SDCB105-Comp	Total/NA	Water	Draft 1633	718223
320-106086-8 - RA	SDCB205-Comp	Total/NA	Water	Draft 1633	718223
320-106086-12 - RA	SDCB-DRAIN-A-Comp	Total/NA	Water	Draft 1633	718223
MB 320-718223/1-A - RA	Method Blank	Total/NA	Water	Draft 1633	718223
LCS 320-718223/3-A - RA	Lab Control Sample	Total/NA	Water	Draft 1633	718223
LCSD 320-718223/4-A - RA	Lab Control Sample Dup	Total/NA	Water	Draft 1633	718223
LLCS 320-718223/2-A - RA	Lab Control Sample	Total/NA	Water	Draft 1633	718223

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Madrona School

Job ID: 320-106086-1

Client Sample ID: SDCB105-Comp

Lab Sample ID: 320-106086-4

Date Collected: 10/16/23 00:00

Matrix: Water

Date Received: 10/18/23 09:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1633			510.0 mL	5.0 mL	718223	11/06/23 12:08	JS	EET SAC
Total/NA	Analysis	Draft 1633		1	1 mL	1 mL	718433	11/07/23 18:36	S1M	EET SAC
Total/NA	Prep	1633	RA		510.0 mL	5.0 mL	718223	11/06/23 12:08	JS	EET SAC
Total/NA	Analysis	Draft 1633	RA	1	1 mL	1 mL	718935	11/09/23 02:18	EMF	EET SAC

Client Sample ID: SDCB205-Comp

Lab Sample ID: 320-106086-8

Date Collected: 10/16/23 00:00

Matrix: Water

Date Received: 10/18/23 09:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1633			510.0 mL	5.0 mL	718223	11/06/23 12:08	JS	EET SAC
Total/NA	Analysis	Draft 1633		1	1 mL	1 mL	718433	11/07/23 18:53	S1M	EET SAC
Total/NA	Prep	1633	RA		510.0 mL	5.0 mL	718223	11/06/23 12:08	JS	EET SAC
Total/NA	Analysis	Draft 1633	RA	1	1 mL	1 mL	718935	11/09/23 02:35	EMF	EET SAC

Client Sample ID: SDCB-DRAIN-A-Comp

Lab Sample ID: 320-106086-12

Date Collected: 10/16/23 00:00

Matrix: Water

Date Received: 10/18/23 09:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1633			510.0 mL	5.0 mL	718223	11/06/23 12:08	JS	EET SAC
Total/NA	Analysis	Draft 1633		1	1 mL	1 mL	718433	11/07/23 19:10	S1M	EET SAC
Total/NA	Prep	1633	RA		510.0 mL	5.0 mL	718223	11/06/23 12:08	JS	EET SAC
Total/NA	Analysis	Draft 1633	RA	1	1 mL	1 mL	718935	11/09/23 02:51	EMF	EET SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: Madrona School

Job ID: 320-106086-1

Laboratory: Eurofins Sacramento

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	02-20-24

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: Madrona School

Job ID: 320-106086-1

Method	Method Description	Protocol	Laboratory
Draft 1633	Per- and Polyfluoroalkyl Substances by LC/MS/MS	EPA	EET SAC
1633	Solid-Phase Extraction (SPE)	EPA	EET SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: Madrona School

Job ID: 320-106086-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-106086-4	SDCB105-Comp	Water	10/16/23 00:00	10/18/23 09:05
320-106086-8	SDCB205-Comp	Water	10/16/23 00:00	10/18/23 09:05
320-106086-12	SDCB-DRAIN-A-Comp	Water	10/16/23 00:00	10/18/23 09:05

Chain of Custody Record

705027

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TAL-8210

Address: EuroFins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other: Washington State Dept. of Ecology

Client Contact	Project Manager: Paul VanHorne	Site Contact: Ryan Peterson	Date: 10/16/2023	COC No:
Company Name: Shannon & Wilson	Tel/Email: paul.vanhorne@shan	Lab Contact: David Alltucker	Carrier: FedEx	1 of 1 COCs
Address: 400 N. 34th St, Suite 100	Analysis Turnaround Time			Sampler: Paul VanHorne
City/State/Zip: Seattle WA 98103	☒ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 206-695-6673	TAT if different from Below: 4 weeks			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: Madrona School	☐ 1 week			
Site: Madrona K-8	☐ 2 days			Job / SDG No.:
PO# 21-1-22082-014	☐ 1 day			

320-106086 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Dioxin EPA 1633	Sample Specific Notes:
SDCB105-A	10/16/23	1040	G	SW	1	N	N	X	See Attached for compositing & centrifuging instructions
SDCB105-B	10/16/23	1210	G	SW	1	N	N	X	
SDCB105-C	10/16/23	1307	G	SW	1	N	N	X	
SDCB205-A	10/16/23	1150	G	SW	1	N	N	X	see attached for compositing & centrifuging instructions.
SDCB205-B	10/16/23	1247	G	SW	1	N	N	X	
SDCB205-C	10/16/23	1341	G	SW	1	N	N	X	
SDCB-DRAIN-A-A	10/16/23	1155	G	SW	1	N	N	X	See attached for compositing & centrifuging instructions.
SDCB-DRAIN-A-B	10/16/23	1252	G	SW	1	N	N	X	
SDCB-DRAIN-A-C	10/16/23	1346	G	SW	1	N	N	X	

[redacted] Used: 1= Ice, 2= HCl; 3= [redacted] 4=HNO3; 5=NaOH; 6= [redacted]

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:
See attached for compositing & centrifuging instructions.

SW = Stormwater matrix.

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.: 2113224	Cooler Temp. (°C): Obs'd: 1.5	Corr'd: 1.5	Therm ID No.: 1010

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Paul VanHorne	Shannon & Wilson	10-17-23 1000		FedEx	10-17-23 1000
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
			[redacted]	DETSAC	10/18/23 0905
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

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Sacramento Sample Receiving Notes (SSRN)

Loc 320
106086

Tracking # 7851 7628 2766

Job _____ _____

SO / PO / FO / SAT / 2-Day / Ground / UPS / CDO / Courier
GSL / OnTrac / Goldstreak / USPS / Other_____

Use this form to record Sample Custody Seal Cooler Custody Seal, Temperature & corrected Temperature & other observations.
File in the job folder with the COC

Therm ID L006 Corr Factor (+/-) NA °C

Ice ✓ Wet ✓ Gel _____ Other _____

Cooler Custody Seal 2113224

Cooler ID _____

Temp Observed 1.5 °C Corrected 1.5 °C

From Temp Blank ☐ Sample ☒

Opening/Processing The Shipment	Yes	No	NA
Cooler compromised/tampered with?	☐	☒	☐
Cooler Temperature is acceptable?	☒	☐	☐
Frozen samples show signs of thaw?	☐	☐	☒

Initials DM Date 10/18/23

Unpacking/Labeling The Samples	Yes	No	NA
Containers are not broken or leaking?	☒	☐	☐
Samples compromised/tampered with?	☐	☒	☐
COC is complete w/o discrepancies	☒	☐	☐
Sample custody seal?	☐	☐	☒
Sample containers have legible labels?	☒	☐	☐
Sample date/times are provided?	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Is the Field Sampler's name on COC?	☒	☐	☐
Samples w/o discrepancies?	☒	☐	☐
Zero headspace?*	☐	☐	☒
Alkalinity has no headspace?	☐	☐	☒
Perchlorate has headspace? (Methods 314, 331 6850)	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

Initials DM Date 10/18/23

Notes _____

Trizma Lot #(s) _____

Ammonium Acetate Lot #(s) _____

Login Completion	Yes	No	NA
Receipt Temperature on COC?	☒	☐	☐
NCM Filed?	☐	☐	☒
Samples received within hold time?	☒	☐	☐
Log Release checked in TALS?	☒	☐	☐

Initials DM Date 10/18/23

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-106086-1

Login Number: 106086
List Number: 1
Creator: Morazzini, Dominic S

List Source: Eurofins Sacramento

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

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL PROPOSAL

More construction problems are caused by site subsurface conditions than any other factor. The following suggestions and observations are offered to help you manage your risks.

HAVE REALISTIC EXPECTATIONS.

If you have never before dealt with geotechnical or environmental issues, you should recognize that site exploration identifies actual subsurface conditions at those points where samples are taken, at the time they are taken. The data derived are extrapolated by the consultant, who then applies judgment to render an opinion about overall subsurface conditions; their reaction to construction activity; appropriate design of foundations, slopes, impoundments, and recovery wells; and other construction and/or remediation elements. Even under optimal circumstances, actual conditions may differ from those inferred to exist, because no consultant, no matter how qualified, and no subsurface program, no matter how comprehensive, can reveal what is hidden by earth, rock, and time.

DEVELOP THE SUBSURFACE EXPLORATION PLAN WITH CARE.

The nature of subsurface explorations—the types, quantities, and locations of procedures used—in large measure determines the effectiveness of the geotechnical/environmental report and the design based upon it. The more comprehensive a subsurface exploration and testing program, the more information it provides to the consultant, helping to reduce the risk of unanticipated conditions and the attendant risk of costly delays and disputes. Even the cost of subsurface construction may be lowered.

Developing a proper subsurface exploration plan is a basic element of geotechnical/environmental design that should be accomplished jointly by the consultant and the client (or designated professional representatives). This helps the parties involved recognize mutual concerns and makes the client aware of the technical options available. Clients who develop a subsurface exploration plan without the involvement and concurrence of a consultant may be required to assume responsibility and liability for the plan's adequacy.

READ GENERAL CONDITIONS CAREFULLY.

Most consultants include standard general contract conditions in their proposals. One of the general conditions most commonly employed is to limit the consulting firm's liability. Known as a "risk allocation" or "limitation of liability," this approach helps prevent problems at the beginning and establishes a fair and reasonable framework for handling them should they arise.

Various other elements of general conditions delineate your consultant's responsibilities. These are used to help eliminate confusion and misunderstandings, thereby helping all parties recognize who is responsible for different tasks. In all cases, read your consultant's general conditions carefully and ask any questions you may have.

HAVE YOUR CONSULTANT WORK WITH OTHER DESIGN PROFESSIONALS.

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a consultant's report. To help avoid misinterpretations, retain your consultant to work with other project design professionals who are affected by the geotechnical/environmental report. This allows a consultant to explain report implications to design professionals affected by them, and to review their plans and specifications so that issues can be dealt with adequately. Although some other design professionals may be familiar with geotechnical/environmental concerns, none knows as much about them as a competent consultant.

OBTAIN CONSTRUCTION MONITORING SERVICES.

Most experienced clients also retain their consultant to serve during the construction phase of their projects. Involvement during the construction phase is particularly important because this permits the consultant to be on hand quickly to evaluate unanticipated conditions, conduct additional tests if required, and when necessary, recommend alternative solutions to problems. The consultant can also monitor the geotechnical/environmental work performed by contractors. It is essential to recognize that the construction recommendations included in a report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site.

Because actual subsurface conditions can be discerned only during earthwork and/or drilling, design consultants need to observe those conditions in order to provide their recommendations. Only the consultant who prepares the report is fully familiar with the background information needed to determine whether or not the report's recommendations are valid. The consultant submitting the report cannot assume responsibility or liability for the adequacy of preliminary recommendations if another party is retained to observe construction.

REALIZE THAT ENVIRONMENTAL ISSUES MAY NOT HAVE BEEN ADDRESSED.

If you have requested only a geotechnical engineering proposal, it will not include services needed to evaluate the likelihood of contamination by hazardous materials or other pollutants. Given the liabilities involved, it is prudent practice to always have a site reviewed from an environmental viewpoint. A consultant cannot be responsible for failing to detect contaminants when the services needed to perform that function are not being provided.

ONE OF THE OBLIGATIONS OF YOUR CONSULTANT IS TO PROTECT THE SAFETY, PROPERTY, AND WELFARE OF THE PUBLIC.

A geotechnical/environmental investigation will sometimes disclose the existence of conditions that may endanger the safety, health, property, or welfare of the public. Your consultant may be obligated under rules of professional conduct, or statutory or common law, to notify you and others of these conditions.

RELY ON YOUR CONSULTANT FOR ADDITIONAL ASSISTANCE.

Your consulting firm is familiar with several techniques and approaches that can be used to help reduce risk exposure for all parties to a construction project, from design through construction. Ask your consultant, not only about geotechnical and environmental issues, but others as well, to learn about approaches that may be of genuine benefit.

The preceding paragraphs are based on information provided by the Geoprofessional Business Association (https://www.geoprofessional.org)