Groundwater Monitoring Report
March 2024

Marshall Landfill
Spokane County, Washington

for
Herrera Environmental Consultants, Inc.

September 27, 2024

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File No. 0504-104-01
September 27, 2024

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1.0 Introduction

This report summarizes analytical results from the March 2024 groundwater monitoring event at the Marshall Landfill (herein referred to as "Site") located in Spokane County, Washington. Groundwater monitoring was conducted by GeoEngineers, Inc. (GeoEngineers) for the Washington State Department of Ecology (Ecology) under Herrera Environmental Consultants, Inc. (Herrera) Client Contract No. C2200149, Amendment 2. The purpose of this sampling was to assess current groundwater conditions to inform Site cleanup design. Groundwater analysis included historic contaminants of concern (COCs) for the Site identified in the Remedial Investigation (RI) report (GEI 2018A) and COCs which had not been previously evaluated, including per- and polyfluoroalkyl substances (PFAS), until the previous groundwater monitoring event conducted in December 2023. The Site location is shown in the Vicinity Map, Figure 1. Key Site features, including monitoring well locations and groundwater elevations, are presented in the Site Plan, Figure 2.

2.0 Site Description and Background

The Site is located northwest of Cheney-Spokane Road about 1 mile southwest of the town of Marshall, Washington and 7 miles southwest of Spokane, Washington. The Site is bounded to the north by a gravel pit and privately-owned undeveloped land, to the east by South Cheney-Spokane Road, to the south by a landfill property owned by Spokane County and to the west by undeveloped land owned by Spokane County Engineers.

The Site consists of two primary historic land use areas: the Main Landfill and the Five-Acre Landfill. The landfills are capped with varying thicknesses of gravel and silt or clay and are generally vegetated. The Site is generally flat to the west and steeply sloped to the east. The Site is described in detail in GeoEngineers' RI and Feasibility Study (FS) reports (2018B). Site features are summarized below:

- The Main Landfill: This approximate 25-acre waste disposal area is located within the south-central portion of the Site. Sand and gravel was removed and replaced with waste during the period from 1970 through 1990. The landfilled waste thickness in this area was estimated to be 100 feet (Fetrow 1991).
- The Five-Acre Landfill: This approximate 5-acre waste disposal area is located within the northwest portion of the Site. Waste was disposed within the Five-Acre Landfill during the period from 1980 through 1984. The landfilled waste thickness in this area was estimated to be 45 feet (Fetrow 1991).

GeoEngineers identified three hydrostratigraphic units in the RI, including:

- The basement rock unit underlying the north portion of the Main Landfill, most of the Five-Acre Landfill, and the central portion of the gravel pit;
- The Columbia River Basalt Group (CRBG) unit underlying the north portions of the Five-Acre Landfill and gravel pit; and
- The glaciofluvial sediments unit underlying the Former Spokane County Landfill, most of the Main Landfill and the southeast corner of the gravel pit.

Groundwater flow is generally to the northeast to southeast in the basement rock unit and to the northeast in the glaciofluvial sediments and CRBG units. The hydrostratigraphic units are described in detail in the RI (GEI 2018A).

Based on RI/FS results and supplemental groundwater monitoring events conducted by Ecology, groundwater contamination is limited, discontinuous and variable between monitoring events. Given the limited and sporadic nature of groundwater contamination, there does not appear to be a significant impact to groundwater beneath the site. However, because the site contains landfilled waste, further groundwater monitoring was requested by Ecology prior to finalizing Site cleanup design.

2.1 GROUNDWATER MONITORING PROGRAM

There are currently 20 monitoring wells at the Site. Ecology identified five initial monitoring wells (MW-2A, MW-5A, MW-7B, MW-11A and MW-12A) to be monitored and sampled to support remedial design. Following the December 2023 groundwater monitoring event (GEI 2024), Ecology identified four additional monitoring wells (MW-8B, MW-9A, MW-15 and MW-16) to be sampled and discontinued sampling at one well. Changes to the groundwater sampling and analysis plan are documented in the updated Groundwater Monitoring Work Plan (Work Plan; GEI 2023). Our specific scope of services for this quarterly event is described below.

3.0 Scope of Services

The purpose of the groundwater monitoring was to evaluate groundwater conditions, including depth, flow direction and COC concentrations at the Site to support remedial design. Groundwater monitoring activities were completed in accordance with the Ecology-approved Work Plan (GEI 2023), except as noted below in Section 3.1, and included the following activities for March 2024:

- Removed existing pumps and redeveloped wells MW-8A, MW-9A, MW-15A and MW-16A using surging and pumping methods;
- Installed new, dedicated PFAS-free low-flow bladder pumps and PFAS-free tubing in groundwater monitoring wells MW-8A, MW-9A, MW-15A and MW-16A;
- Measured depth to groundwater in 17 groundwater monitoring wells as outlined in Section 5.1 below;
- Collected water quality parameters and groundwater samples using low-flow well purging techniques and dedicated bladder pumps from groundwater monitoring wells MW-2A, MW-5A, MW-7B, MW-8A, MW-9A, MW-12A, MW-15A and MW-16A;
- Submitted one groundwater sample from monitoring wells MW-2A, MW-5A, MW-7B, MW-8A, MW-9A, MW-12A, MW-15A and MW-16A and one duplicate groundwater sample from monitoring well MW-5A to Eurofins Environment Testing Northwest (Eurofins) in Spokane Valley, Washington for the chemical analyses listed in Section 5.2;
- Collected and submitted quality assurance/quality control (QA/QC) samples, including one field blank to Eurofins for chemical analysis;
- Drummed and labeled investigation-derived waste (IDW) produced from redevelopment and groundwater sampling activities. Coordinated transport and off-site disposal of redevelopment fluids at the Chemical Waste Management facility in Arlington, Oregon; and

- Documented sampling activities in this report.

3.1 DEVIATIONS FROM WORK PLAN

The following deviations from the Work Plan were conducted during this investigation:

- Three wells (MW-8A, MW-15A and MW-16A) were redeveloped, equipped with new PFAS-free dedicated pumps, and sampled instead of monitoring wells MW-8B, MW-15 and MW-16 that were specified in the Work Plan for sampling. MW-8A, MW-15A and MW-16A were historically installed as paired wells with the monitoring wells that were intended for sampling (MW-8B, MW-15 and MW-16) and are the deeper of the well pair; ex. MW-8A which was sampled is deeper than MW-8B which was supposed to be sampled. Groundwater samples collected from wells MW-8A, MW-15A and MW-16A were submitted for chemical analysis based on the analysis intended for its well pair per the Work Plan. Text, tables, figures and chemical analytical laboratory reports contained herein reflect actual wells sampled.

4.0 Monitoring Well Redevelopment

Monitoring wells that were added to the sampling program starting this quarter, MW-8A, MW-9A, MW-15A and MW-16A, were redeveloped between March 18 and 20, 2024, using pumping and surging methods in accordance with the Work Plan. Prior to well redevelopment, dedicated pumps and tubing were removed from each monitoring well. Additionally, well volumes were calculated based on depth to water and well bottom information for each well to establish target volumes for groundwater removal during redevelopment. Five well volumes or a maximum volume of 90 gallons were removed from each well using PFAS-free equipment, as shown in Table I. New PFAS-free bladder pumps and tubing were installed following development activities. Redevelopment fluids were stored on site in secured drums prior to waste profiling and off-site disposal.

TABLE I. MONITORING WELL DEVELOPMENT SUMMARY

Monitoring Well	Well Volume[1] (gallons)	Target Removal Volume (gallons)	Volume Removed (gallons)	Water Quality Observations Following Development
MW-8A	22.3	90	35; well purged dry and allowed to recharge	Clear
MW-9A	28.0	90	90	Clear
MW-15A	5.9	29.5	90	Clear
MW-16A	6.7	33.5	90	Clear

Notes:

[1] Well volume calculated using depth to water and total depth measurements relative to the top of casing.

5.0 Groundwater Monitoring

5.1 GROUNDWATER ELEVATION AND FLOW DIRECTION

Depth to groundwater was measured in 17 groundwater monitoring wells (MW-1A, MW-2, MW-2A, MW-3, MW-4A, MW-5A, MW-7B, MW-7D, MW-8A, MW-8B, MW-9A, MW-11A, MW-12A, MW-14, MW-15, MW-15A and MW-16A) on March 25, 2024. Monitoring well construction details are summarized in Table 1, and

their locations are shown on Figure 2. Groundwater elevations were calculated by subtracting the depth to water measurement from the surveyed top of well casing elevation and are referenced to the North American Vertical Datum of 1988 (NAVD88). Groundwater elevations ranged from approximately 2079.90 feet in MW-8A to 2251.61 feet in MW-12A.

Based on groundwater elevations measured during the March 2024 groundwater monitoring event, the inferred groundwater flow direction in the basement rock aquifer is generally to the east-northeast across the landfills, and to the northeast in the glaciofluvial aquifer within the Main Landfill and valley bottom. Groundwater depths and elevations from the March 2024 event are provided in Table 1 and interpreted groundwater contours are shown in Figure 3. A summary of groundwater depths and elevations measured during previous events (2023 to present) is included in Appendix A Table A-1.

5.2 GROUNDWATER SAMPLING

Groundwater samples were collected from monitoring wells MW-2A, MW-5A, MW-7B, MW-8A, MW-9A, MW-12A, MW-15A and MW-16A on March 25 through March 27, 2024. A duplicate sample was collected from monitoring well MW-5A. Groundwater samples were submitted for chemical analysis, as described below, to Eurofins in Spokane Valley, Washington on a standard turnaround time. Groundwater quality parameters are summarized in Table 2. A summary of water quality parameters during previous events is included in Appendix A, Table A-2.

Groundwater samples from MW-2A, MW-5A (and the duplicate), MW-7B, MW-8A, MW-9A, MW-15A and MW-16A were analyzed for PFAS using U.S Environmental Protection Agency (EPA) Method 1633 (Draft-4). The groundwater samples from MW-2A, MW-5A, MW-7B and MW-12 were also analyzed for the following:

- Alkalinity and bicarbonate using Standard Method (SM) 2320B;
- Total and dissolved arsenic, cadmium, iron, manganese, lead and zinc using EPA Method 6020B;
- Total and dissolved mercury using EPA Method 7470A;
- Total potassium, magnesium and sodium using EPA Method 6010D;
- Dissolved calcium and magnesium using EPA Method 6010D;
- Chloride, sulfate, nitrate, and nitrite using EPA Method 300.0;
- Ammonia as nitrogen using EPA Method 350.1;
- Total organic carbon (TOC) using SM 5310B;
- Total dissolved solids (TDS) using SM 2540C;
- Tetrachloroethene (PCE) and 1,1,1-trichloroethane (1,1,1-TCA) using EPA Method 8260D; and
- 1,4-Dioxane using EPA Method 8270E SIM.

6.0 Investigation-Derived Waste

Water generated from well redevelopment and sampling was placed in labeled 55-gallon steel drums staged on site near each well and covered with a tarp prior to transport and off-site disposal at a permitted facility. The IDW was disposed in June 2024 at the Chemical Waste Management facility in Arlington,

Oregon. Subtitle C disposal was required because IDW contained PFAS. Waste disposal tickets will be provided in a subsequent groundwater monitoring report.

7.0 Groundwater Analytical Results

Chemical analytical results for the first quarter 2024 sampling event are summarized below and in Table 3. Regulatory criteria used for comparison include Model Toxics Control Act (MTCA) Method A/B groundwater cleanup levels, the Washington Department of Health (DOH) State Action Levels (SALs) and the EPA Maximum Contaminant Levels (MCLs); the lowest available criteria were used for discussion below. Chemical analytical results for the previous groundwater monitoring events are included in Appendix A, Table A-3.

- PFAS:
  - Perfluorooctanoic acid (PFOA) was detected greater than the MTCA Method B cleanup level (0.48 nanograms per liter [ng/L]) in groundwater samples from five locations: MW-5A and its duplicate (39 and 38 ng/L respectively), MW-8A (4.4 ng/L), MW-9A (0.70 ng/L), MW-15A (5.8 ng/L) and MW-16A (1.5 ng/L). The MTCA Method B cleanup level is lower than both the DOH SAL and EPA MCL for PFOA.
  - Perfluorooctanesulfonic acid (PFOS) was detected greater than the MTCA Method B cleanup level (1.6 ng/L) in groundwater samples from six locations: MW-2A (2.7 ng/L), MW-5A and its duplicate (both 15 ng/L), MW-8A (3.0 ng/L), MW-9A (1.9 ng/L), MW-15A (9.9 ng/L), and MW-16A (2.6 ng/L). The MTCA Method B cleanup level is lower than both the DOH SAL and EPA MCL for PFOS.

  The other PFAS compounds analyzed were either detected at concentrations less than their respective MTCA cleanup levels, DOH SALs and EPA MCLs, where established or were not detected at concentrations exceeding the laboratory reporting limits.
- Other COCs analyzed were either detected at concentrations less than their MTCA cleanup levels, DOH SALs, or EPA MCLs where established or were not detected exceeding the laboratory reporting limits.
- COCs analyzed in the field blank were not detected at concentrations exceeding the laboratory reporting limits.

The chemical analytical laboratory report is included in Appendix B.

7.1 DATA QUALITY EXCEPTIONS

Samples assigned data qualifiers based on our data validation process are summarized as follows:

- 1,4-Dioxane analysis for the samples collected from monitoring wells MW-5A, MW-7B, MW-12A and the duplicate were assigned the qualifier UJ for surrogate recovery because the percent recovery of the surrogate was less than the control limits.
- Dissolved magnesium analysis for the sample collected from monitoring well MW-12A was assigned the qualifier J for laboratory duplicate precision because the relative percent difference (RPD) was greater than the control limit in the laboratory duplicate.
- Nitrate analysis for the samples collected from monitoring wells MW-2A and MW-12A were assigned the qualifier J for holding time because the 48-hour holding time for nitrate was exceeded and there was a positive detection of nitrate in those samples.

- Nitrite analysis for the samples collected from monitoring wells MW-2A, MW-5A, MW-12A and the duplicate were assigned the qualifier UJ for holding time because the 48-hour holding time for nitrite was exceeded.
- Total and dissolved mercury analysis for the samples collected from monitoring wells MW-2A, MW-5A, MW-7B, MW-12A and the duplicate were assigned the qualifier U for method blank contamination because mercury was detected in the method blank.

Based on our data validation results and our overall data quality review, it is our opinion that the analytical data are of acceptable quality for their intended use, noting the qualifications listed above and discussed in detail in our data validation report included as Appendix C, Chemical Analytical Data Review.

8.0 Summary and Future Monitoring Schedule

The March 2024 groundwater monitoring event was conducted at the Site between March 18 and 27, 2024. Four monitoring wells were redeveloped and fitted with new dedicated PFAS-free equipment on March 18 through 20, 2024, and eight monitoring wells were sampled on March 25 through 27, 2024.

Groundwater elevations, calculated from depth to groundwater measurements, indicated a east-northeast flow direction in the bedrock aquifer across the landfills and northeast flow direction in the glaciofluvial aquifer throughout the Main Landfill and valley bottom which is generally consistent with previous monitoring data from the Site. Groundwater elevations increased in all wells compared to December 2023 conditions except in well MW-7D. As expected, glaciofluvial aquifer wells experienced the greatest change in groundwater elevation, with increases between 14.66 feet (MW-8B) and 36.16 (MW-9A) from December 2023 to March 2024. Groundwater elevations in basement rock wells generally increased, although with a muted response compared to glaciofluvial aquifer wells. Groundwater elevation increases in basement rock wells ranged from greater than 5.5 feet (MW-1A) to 14.05 feet (MW-8A). The groundwater elevation in basement rock well MW-7D decreased by approximately 4.18 feet. Groundwater elevations in the only CRBG well (MW-12A) increased approximately 15.93 feet between the December 2023 and March 2024 events.

PFAS including PFOS and/or PFOA were detected at concentrations greater than the newly established MTCA Method B cleanup levels in groundwater samples from monitoring wells MW-2A, MW-5A, MW-8A, MW-9A, MW-15A and MW-16A. The concentrations of PFAS decreased between December 2023 and March 2024 in all wells where they were detected during both events. Note that wells MW-8A, MW-9B, MW-15A and MW-16A were not previously analyzed for PFAS.

The other COCs analyzed were either not detected above laboratory reporting limits or were detected at concentrations less than their respective MTCA cleanup levels, DOH SALs and EPA MCLs, where established. Based on these results, additional sampling for PFAS in groundwater, particularly from groundwater wells which have not previously been sampled for PFAS, may be warranted to understand the current nature and extent of PFAS impacts across the Site. Additional PFAS sampling in groundwater could also inform potential upgradient source(s) of PFAS beyond the landfilled waste, if any. Any future changes to the groundwater monitoring program will be documented in a Work Plan addendum for Herrera and Ecology approval prior to implementation.

The next groundwater monitoring event is scheduled to occur in the second quarter of 2024.

9.0 Limitations

We have prepared this report for Herrera and Ecology in accordance with the generally accepted environmental science practices in this area at the time this report was prepared. We have prepared this report for the exclusive use of Herrera and Ecology, their authorized agents and regulatory agencies; therefore, this report is not intended for use by others and the information contained herein is not applicable to other sites. The data presented in this report are based on the agreed upon scope of services outlined in the report. Use of this report for any purpose whatsoever by any other parties is at their own risk. No third party shall have the right to rely on the product of GeoEngineers, Inc.'s (GeoEngineers') services without GeoEngineers' prior written consent and the third party's Agreement to be bound by the same terms and conditions as Herrera and Ecology. GeoEngineers makes no representation to such other parties as to the accuracy or completeness of this report or the suitability of its use by any other parties for any purpose whatsoever, known or unknown. GeoEngineers, Herrera and Ecology shall not be liable to indemnify or hold harmless any third parties for losses incurred by the actual or purported use or misuse of this report.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix D, Report Limitations and Guidelines for Use, for additional information pertaining to use of this report.

10.0 References

Fetrow Engineering, Inc. (Fetrow) 1991. "Marshall Landfill Site Characterization Study Final Report (Volumes 1 and 2). September, 1991.

GeoEngineers, Inc. (GEI) 2018A. "Remedial Investigation Report, Marshall Landfill, Spokane County, Washington." GEI File No. 0504-104-00, May 22, 2018.

GEI 2018B. "Feasibility Study Report, Marshall Landfill, Spokane County, Washington." GEI File No. 0504-104-00, May 31, 2018.

GEI 2023. "Work Plan, Marshall Landfill Groundwater Monitoring, Marshall Landfill, Spokane County, Washington." GEI File No. 0504-104-01, November 17, 2023. Updated April 25, 2024.

GEI 2024. "Groundwater Monitoring Report, December 2023, Marshall Landfill, Spokane County, Washington." GEI File No. 0504-104-01, April 26, 2024.

Tables

Table 1

Summary of Groundwater Monitoring Well Measurements – March 2024

Marshall Landfill

Spokane County, Washington

Monitoring Well ID and Top of Casing Elevation[1] (feet)	Well Screen Interval (feet bTOC)	Measured Depth to Bottom of Well[2] (feet bTOC)	Aquifer	Date Measured	Depth to Groundwater (feet bTOC)	Groundwater Elevation[3] (feet)
MW-1A 2335.52	199 to 209	210	Weathered Basement	3/25/2024	205.55	2129.97
MW-2 2176.05	73 to 83	83	Glaciofluvial	3/25/2024	68.30	2107.75
MW-2A 2175.80	93 to 108	108	Glaciofluvial	3/25/2024	68.49	2107.31
MW-3 2182.30	106 to 116	118	Glaciofluvial	3/25/2024	84.75	2097.55
MW-4A 2,159.26	63 to 78	80	Glaciofluvial	3/25/2024	36.02	2123.24
MW-5A 2,187.46	124.5 to 139.5	143[4]	Glaciofluvial	3/25/2024	99.10	2088.36
MW-7B 2327.48	288.5 to 298.5	299	Basement	3/25/2024	218.30	2109.18
MW-7D 2331.70	283 to 298	298	Basement	3/25/2024	218.35	2113.35
MW-8A 2,139.65	104.5 to 119.5	122	Basement	3/25/2024	59.75	2079.90
MW-8B 2139.56	64.5 to 89.5	94	Glaciofluvial	3/25/2024	59.11	2080.45
MW-9A 2,156.97	43.5 to 68.5	72	Glaciofluvial	3/25/2024	28.89	2128.08
MW-11A 2,324.51	207.5 to 237.5	243	Weathered Basement	3/25/2024	208.10	2116.41
MW-12A 2353.36	104.5 to 134.5	135	CRBG	3/25/2024	101.75	2251.61
MW-14 2,313.83	242.3 to 252.3	255	Glaciofluvial	3/25/2024	203.30	2110.53

Monitoring Well ID and Top of Casing Elevation[1] (feet)	Well Screen Interval (feet bTOC)	Measured Depth to Bottom of Well[2] (feet bTOC)	Aquifer	Date Measured	Depth to Groundwater (feet bTOC)	Groundwater Elevation[3] (feet)
MW-15 2236.04	160 to 175	179	Glaciofluvial	3/25/2024	144.08	2091.96
MW-15A 2,237.26	192 to 202	205	Glaciofluvial	3/25/2024	142.88	2094.38
MW-16 2170.24	69.5 to 86.5	89	Glaciofluvial	--	Not Measured	--
MW-16A 2167.89	111 to 126	132[5]	Basement	3/25/2024	49.55	2118.34

Notes:

[1] Monitoring well locations are shown on Figures 2 and 3. Top of monitoring well casing elevations referenced to NAVD88 datum, as reported in the Remedial Investigation Report for the site dated May 22, 2018.

[2] Depth to bottom measured on December 14, 2023 unless otherwise noted.

[3] Groundwater elevations calculated using the formula: Groundwater Elevation = Top of Casing Elevation - Depth to Water

[4] Measured depth to bottom on August 9, 2024.

[5] Measured depth to bottom on August 8, 2024.

bTOC = below top of casing

CRBG = Columbia River Basalt Group

Table 2

Summary of Water Quality Parameters – March 2024

Marshall Landfill

Spokane County, Washington

Monitoring Well ID[1]	Date Measured	pH	Specific Conductivity (µS/cm)	Redox Potential (millivolts)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Temperature (degrees C)
MW-2A	03/26/24	6.65	549.0	102.5	3.3	12.66	9.1
MW-5A	03/27/24	6.88	588	127.9	2.2	1.37	10.1
MW-7B	03/27/24	6.73	291.1	79.2	0.36	1.7	12.4
MW-8A	03/26/24	7.08	426.0	118.4	5.3	62.8	10.3
MW-9A	03/26/24	6.77	498.5	136.2	5.8	2.85	4.9
MW-15A	03/25/24	6.47	644	95.3	0.27	221.48	13.0
MW-16A	03/26/24	6.90	620.0	29.7	0.37	1.90	10.1
MW-12A	03/25/24	7.13	316.4	133.1	11.1	22.99	11.1

Notes:

[1] Monitoring well locations are shown on Figures 2 and 3.

µS/cm = microsiemens per centimeter; mg/L = milligrams per liter

NTU = Nephelometric Turbidity Unit; C = Celsius

Table 3

Summary of Groundwater Chemical Analytical Results – March 2024

Marshall Landfill

Spokane County, Washington

Location ID	MW-2A	MW-5A		MW-7B	MW-8A	MW-9A	MW-12A	MW-15A	MW-16A	MTCA Cleanup Level[3]	DOH SAL[4]	EPA MCL[5]
Sample ID	MW-2A-032624	MW-5A-032724	DUP-032724[2]	MW-7B-032724	MW-8A-032624	MW-9A-032624	MW-12A-032524	MW-15A-032524	MW-16A-032624			
Sample Date	3/26/2024	3/27/2024		3/27/2024	3/26/2024	3/26/2024	3/25/2024	3/25/2024	3/26/2024			
Volatile Organic Compounds by EPA 8260D (µg/L)												
1,1,1-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	--	--	1.0 U	--	--	200	NE	NE
Tetrachloroethene	1.0 U	1.0 U	1.0 U	1.0 U	--	--	1.0 U	--	--	5	NE	NE
Semivolatile Organic Compounds and Polycyclic Aromatic Hydrocarbons by EPA 8270E (µg/L)							--					
1,4-Dioxane	0.19 U	0.19 UJ	0.21 UJ	0.18 UJ	--	--	0.19 UJ	--	--	0.44	NE	NE
Per- and Polyfluoroalkyl Substances by EPA Draft-4 1633 (ng/L)												
Perfluorobutanoic acid (PFBA)	7.2 U	**19**	**19**	**4.3 J**	**14**	7.1 U	--	**53**	**2.6 J**	8,000	NE	NE
Perfluoropentanoic acid (PFPeA)	3.6 U	**13**	**13**	**3.6 J**	**22**	3.6 U	--	**28**	**2.1 J**	NE	NE	NE
Perfluorohexanoic acid (PFHxA)	1.8 U	**24**	**23**	**1.4 J**	**7.4**	1.8 U	--	**8.7**	**1.0 J**	8,000	NE	NE
Perfluoroheptanoic acid (PFHpA)	1.8 U	**21**	**19**	**0.77 J**	**2.8**	1.8 U	--	**5.2**	1.8 U	NE	NE	NE
Perfluorooctanoic acid (PFOA)	1.8 U	**39**	**38**	2.1 U	**4.4**	**0.70 J**	--	**5.8**	**1.5 J**	0.48	10	4
Perfluorononanoic acid (PFNA)	1.8 U	**1.0 J**	**1.1 J**	2.1 U	1.8 U	1.8 U	--	**1.6 J**	1.8 U	40	9	10
Perfluorodecanoic acid (PFDA)	1.8 U	1.8 U	1.9 U	2.1 U	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
Perfluoroundecanoic acid (PFUnA)	1.8 U	1.8 U	1.9 U	2.1 U	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
Perfluorododecanoic acid (PFDoA)	1.8 U	1.8 U	1.9 U	2.1 U	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
Perfluorotridecanoic acid (PFTrDA)	1.8 U	1.8 U	1.9 U	2.1 U	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
Perfluorotetradecanoic acid (PFTeDA)	1.8 U	1.8 U	1.9 U	2.1 U	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
Perfluorobutanesulfonic acid (PFBS)	**0.98 J**	**7.8**	**8.3**	2.1 U	**1.7 J**	**3.3**	--	**4.0**	1.8 U	4,800	345	NE
Perfluoropentanesulfonic acid (PFPeS)	1.8 U	**2.5**	**2.3**	2.1 U	**0.61 J**	1.8 U	--	0.8 U	1.8 U	NE	NE	NE
Perfluorohexanesulfonic acid (PFHxS)	**0.58 J**	**9.3**	**8.8**	2.1 U	**2.4**	**1.3 J**	--	**2.1**	1.8 U	160	65	10
Perfluoroheptanesulfonic acid (PFHpS)	1.8 U	1.8 U	1.9 U	2.1 U	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
Perfluorooctanesulfonic acid (PFOS)	**2.7**	**15**	**15**	2.1 U	**3.0**	**1.9**	--	**9.9**	**2.6**	1.6	15	4
Perfluorononanesulfonic acid (PFNS)	1.8 U	1.8 U	1.9 U	2.1 U	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
Perfluorodecanesulfonic acid (PFDS)	1.8 U	1.8 U	1.9 U	2.1 U	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
Perfluorododecanesulfonic acid (PFDoS)	1.8 U	1.8 U	1.9 U	2.1 U	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	7.2 U	7.2 U	7.4 U	8.4 U	7.4 U	7.1 U	--	7.3 U	7.3 U	NE	NE	NE
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	7.2 U	7.2 U	7.4 U	8.4 U	7.4 U	7.1 U	--	7.3 U	7.3 U	NE	NE	NE
Perfluorooctanesulfonamide (PFOSA)	1.8 U	1.8 U	1.9 U	**1.5 J**	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
N-methylperfluorooctane sulfonamide (NMeFOSA)	1.8 U	1.8 U	1.9 U	2.1 U	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
N-ethylperfluorooctane sulfonamide (NEtFOSA)	1.8 U	1.8 U	1.9 U	2.1 U	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	1.8 U	1.8 U	1.9 U	2.1 U	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	1.8 U	1.8 U	1.9 U	2.1 U	1.8 U	1.8 U	--	1.8 U	1.8 U	NE	NE	NE
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	18 U	18 U	19 U	21 U	18 U	18 U	--	18 U	18 U	NE	NE	NE
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	18 U	18 U	19 U	21 U	18 U	18 U	--	18 U	18 U	NE	NE	NE
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	7.2 U	7.2 U	7.4 U	8.4 U	7.4 U	7.1 U	--	7.3 U	7.3 U	24	NE	10
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.2 U	7.2 U	7.4 U	8.4 U	7.4 U	7.1 U	--	7.3 U	7.3 U	NE	NE	NE
Perfluoro-3-methoxypropanoic acid (PFMPA)	3.6 U	3.6 U	3.7 U	4.2 U	3.7 U	3.6 U	--	3.6 U	3.7 U	NE	NE	NE
Perfluoro-4-methoxybutanoic acid (PFMBA)	3.6 U	3.6 U	3.7 U	4.2 U	3.7 U	3.6 U	--	3.6 U	3.7 U	NE	NE	NE
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	3.6 U	3.6 U	3.7 U	4.2 U	3.7 U	3.6 U	--	3.6 U	3.7 U	NE	NE	NE
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	7.2 U	7.2 U	7.4 U	8.4 U	7.4 U	7.1 U	--	7.3 U	7.3 U	NE	NE	NE
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	7.2 U	7.2 U	7.4 U	8.4 U	7.4 U	7.1 U	--	7.3 U	7.3 U	NE	NE	NE
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	3.6 U	3.6 U	3.7 U	4.2 U	3.7 U	3.6 U	--	3.6 U	3.7 U	NE	NE	NE
3-Perfluoropropylpropanoic acid (3:3 FTCA)	9.0 U	8.9 U	9.3 U	10.0 U	9.2 U	8.9 U	--	9.1 U	9.2 U	NE	NE	NE
3-Perfluoropentylpropanoic acid (5:3 FTCA)	45 U	45 U	46 U	52 U	46 U	45 U	--	46 U	46 U	NE	NE	NE
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	45 U	45 U	46 U	52 U	46 U	45 U	--	46 U	46 U	NE	NE	NE
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	7.2 U	7.2 U	7.4 U	8.4 U	7.4 U	7.1 U	--	7.3 U	7.3 U	NE	NE	NE

Location ID	MW-2A	MW-5A		MW-7B	MW-8A	MW-9A	MW-12A	MW-15A	MW-16A	MTCA Cleanup Level[3]	DOH SAL[4]	EPA MCL[5]
Sample ID	MW-2A-032624	MW-5A-032724	DUP-032724[2]	MW-7B-032724	MW-8A-032624	MW-9A-032624	MW-12A-032524	MW-15A-032524	MW-16A-032624			
Sample Date	3/26/2024	3/27/2024		3/27/2024	3/26/2024	3/26/2024	3/25/2024	3/25/2024	3/26/2024			
Total Metals by EPA 6020B (mg/L)												
Arsenic	**0.0018 J**	**0.0012 J**	**0.0014 J**	0.0050 U	--	--	0.0050 U	--	--	0.005	0.005	NE
Cadmium	0.0020 U	0.0020 U	0.0020 U	0.0020 U	--	--	0.0020 U	--	--	0.005	0.005	NE
Iron	0.50 U	0.50 U	0.50 U	**0.13 J**	--	--	0.50 U	--	--	11	11	NE
Lead	0.0020 U	0.0020 U	0.0020 U	**0.00088 J**	--	--	0.0020 U	--	--	0.015	0.015	NE
Manganese	0.010 U	0.010 U	0.010 U	**0.0050 J**	--	--	0.010 U	--	--	0.75	0.75	NE
Zinc	0.035 U	0.035 U	0.035 U	**0.0055 J**	--	--	0.035 U	--	--	4.8	4.8	NE
Total Metals by EPA 7470A (µg/L)												
Mercury	0.20 U	0.20 U	0.20 U	0.20 U	--	--	0.20 U	--	--	2	2	NE
Dissolved Metals[6] by EPA 6020B (mg/L)												
Arsenic	**0.0019 J**	**0.0012 J**	**0.0013 J**	0.0050 U	--	--	0.0050 U	--	--	0.005	0.005	NE
Cadmium	0.0020 U	0.0020 U	0.0020 U	0.0020 U	--	--	0.0020 U	--	--	0.005	0.005	NE
Iron	0.50 U	0.50 U	0.50 U	0.50 U	--	--	0.50 U	--	--	11	11	NE
Lead	0.0020 U	0.0020 U	0.0020 U	0.0020 U	--	--	0.0020 U	--	--	0.015	0.015	NE
Manganese	**0.013**	0.010 U	0.010 U	**0.0078 J**	--	--	0.010 U	--	--	0.75	0.75	NE
Zinc	0.035 U	**0.0060 J**	0.035 U	**0.0046 J**	--	--	0.035 U	--	--	4.8	4.8	NE
Dissolved Metals[6] by EPA 7470A (µg/L)												
Mercury	0.20 U	0.20 U	0.20 U	0.20 U	--	--	0.20 U	--	--	2	2	NE
General Chemistry Parameters (mg/L), method noted in parentheses												
Ammonia as Nitrogen (EPA 350.1)	0.10 U	0.10 U	0.10 U	0.10 U	--	--	0.10 U	--	--	NE	NE	NE
Alkalinity (SM 2320B)	**200**	**340**	**330**	**160**	--	--	**110**	--	--	NE	NE	NE
Bicarbonate Alkalinity as CaC03 (SM 2320B)	**200**	**340**	**330**	**160**	--	--	**110**	--	--	NE	NE	NE
Total Dissolved Solids (SM 2540C)	**340**	**540**	**520**	**230**	--	--	**140**	--	--	NE	NE	NE
Total Organic Carbon (SM 5310B)	**3.1**	**2.5**	**2.3**	**0.78 J**	--	--	**2.8**	--	--	NE	NE	NE
Total Magnesium (EPA 6010D)	**16**	**11**	**11**	**11**	--	--	**11**	--	--	NE	NE	NE
Dissolved Magnesium (EPA 6010D)	**13**	**10**	**10**	**10**	--	--	**10 J**	--	--	NE	NE	NE
Total Potassium (EPA 6010D)	**6.8**	**3.8**	**3.8**	**1.6**	--	--	**2.6**	--	--	NE	NE	NE
Total Sodium (EPA 6010D)	**37**	**27**	**27**	**4.0**	--	--	**8.6**	--	--	NE	NE	NE
Dissolved Calcium (EPA 6010D)	**32**	**71**	**72**	**34**	--	--	**29**	--	--	NE	NE	NE
Chloride (EPA 300.0)	**62**	**54**	**57**	**0.70 J**	--	--	**6.7**	--	--	NE	NE	NE
Nitrate as N (EPA 300.0)	**2.4 J**	**1.4**	**1.9**	0.20 U	--	--	**8.1 J**	--	--	26	26	NE
Nitrite as N (EPA 300.0)	0.20 UJ	0.20 UJ	**0.43 J**	0.20 U	--	--	0.20 UJ	--	--	1.6	1.6	NE
Sulfate (EPA 300.0)	**21**	**14**	**14**	**3.9**	--	--	**16**	--	--	NE	NE	NE

Notes:

[1] Samples analyzed by Eurofins Environment Testing located in Spokane Valley, Washington. Monitoring well locations are shown on Figures 2 and 3.

[2] Duplicate sampling procedures are summarized in the Work Plan for Marshall Landfill Groundwater Monitoring dated November 17, 2023. Other quality assurance/quality control sampling (not shown) included trip blank and field blank sampling and analysis. Analyzed contaminants of concern were not detected above laboratory reporting limits in the trip blank or field blank (see laboratory reports).

[3] MTCA Method A or B Cleanup Level.

[4] DOH SAL for PFAS compounds are listed where available.

[5] EPA MCL for PFAS compounds are listed where available.

[6] Samples submitted for dissolved metals analysis were lab filtered.

J = estimated concentration; refer to laboratory and data validation reports for data qualifier information and discussion (Appendices C and D respectively).

mg/L = milligrams per liter; µg/L = micrograms per liter; ng/L = nanogram per liter; ND = non detected; NE = not established; U = analyte was not detected above the laboratory reporting limit; "--" = not analyzed.

MTCA CUL = Model Toxics Control Act Cleanup Level (Method A or B)

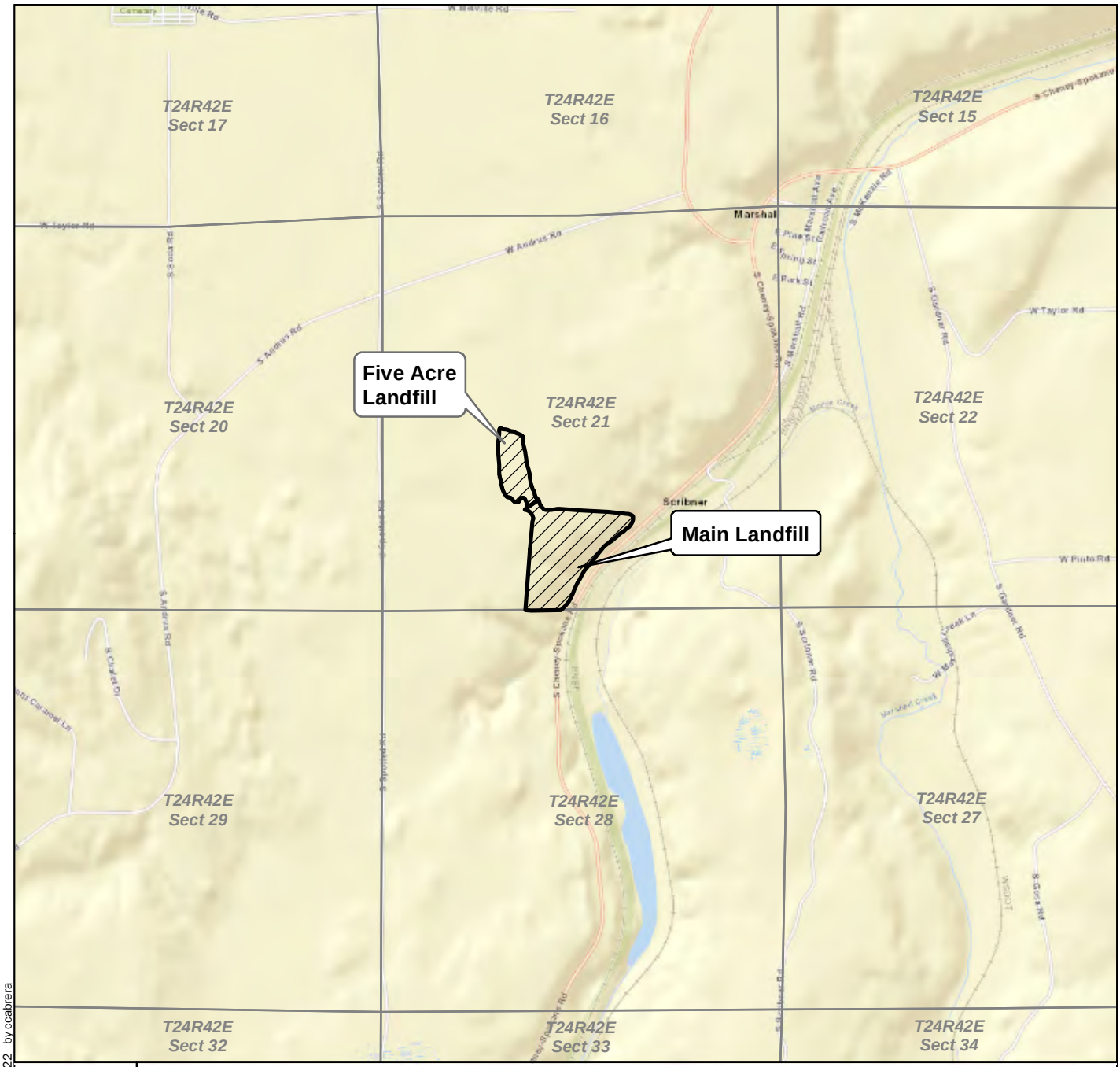
DOH SAL = Washington State Department of Health State Action Level

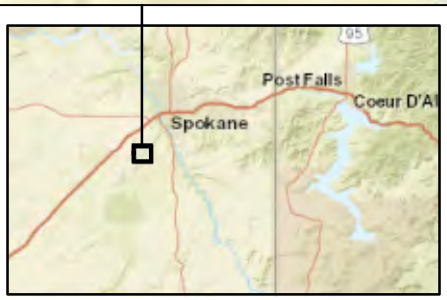
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level

Bold indicates analyte was detected above the laboratory reporting limit.

Bold with gray shading indicates the analyte was detected at a concentration greater than the lowest listed screening criteria (MTCA CUL, DOH SAL or EPA MCL).

Figures





N
W E
S

2,000 0 2,000

Feet

Vicinity Map

Marshall Landfill
Spokane County, Washington

GeoEngineers

Figure 1

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2016

Projection: NAD 1983 UTM Zone 11N

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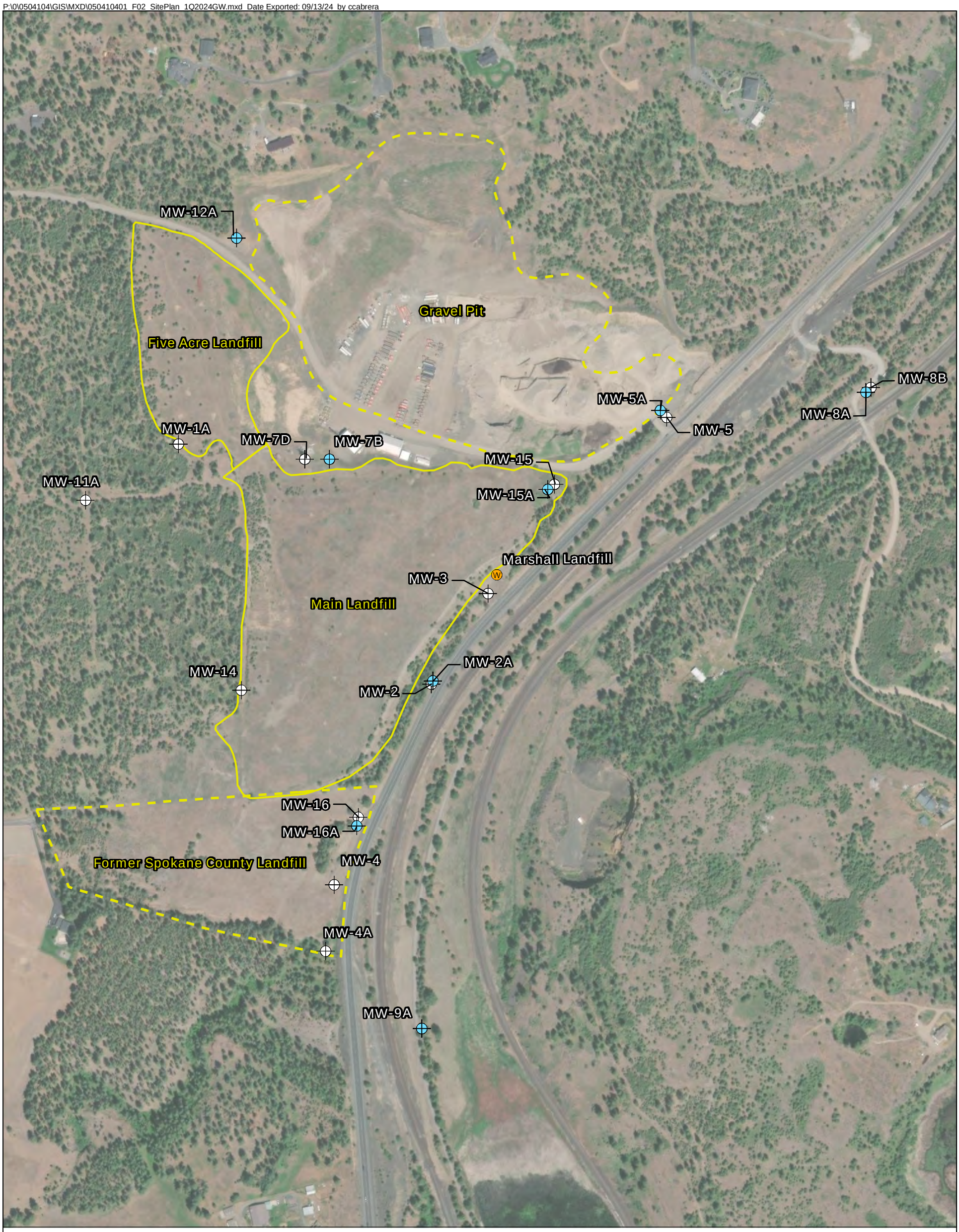

Legend

- MW-2A — Monitoring Well Sampled in March 2024
- MW-5A — Monitoring Well Location and Well Number
- Marshall Landfill (W) — Marshall Landfill Groundwater Supply Well
- Approximate Landfill Boundaries[3]
- Approximate Limits of Adjacent Landfill or Mining Land Use[3]

N, W, E, S

400 0 400
Feet

Data Source: Aerial from ESRI Data Online. Water features from PNW Hydrography.

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. Boundaries of landfill and mining land use were adapted from Fetrow Engineering (1991) based on Remedial Investigation explorations, aerial photography and test pit investigation data collected in November 2022. The Former Spokane County landfill boundaries have not been modified from Fetrow Engineering (1991).

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Site Plan

Marshall Landfill
Spokane County, Washington

GeoEngineers

Figure 2

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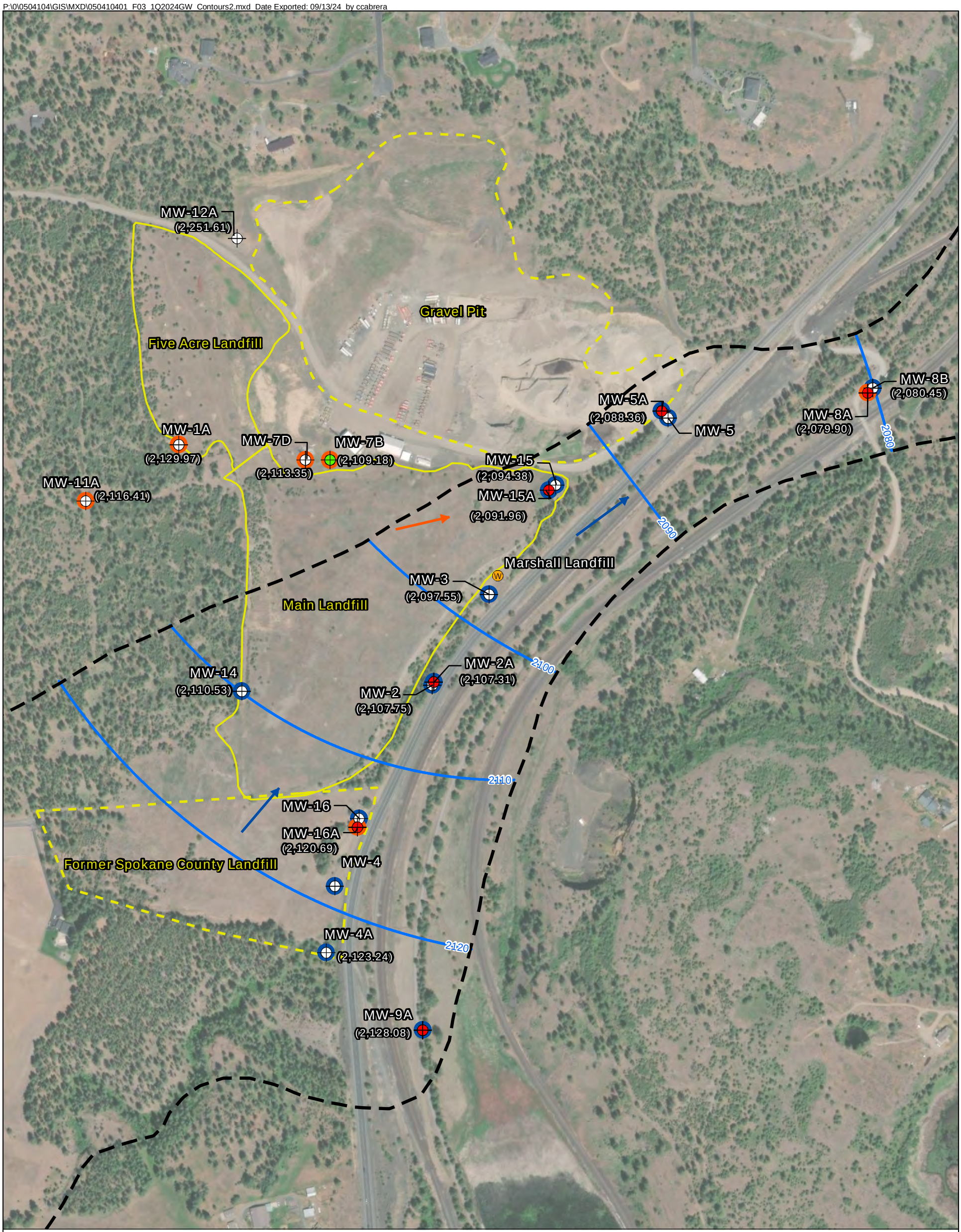


Legend

- Monitoring Well Location, Well Number and Groundwater Elevation (feet), if Measured.
- PFAS Were Detected at Concentrations Less than Screening Criteria in March 2024
- PFAS Were Detected at Concentrations Above Screening Criteria in March 2024
- Marshall Landfill Groundwater Supply Well
- Glaciofluvial Unit Boundary (see Note 4)
- Estimated groundwater contour for Glaciofluvial Aquifer (feet, NAVD88)
- Inferred Groundwater Flow Direction for Basement Aquifer
- Inferred Groundwater Flow Direction for Glaciofluvial Aquifer
- Approximate Landfill Boundaries[3]
- Approximate Limits of Adjacent Landfill or Mining Land Use[3]
- Well Screened in Basement Group Aquifer
- Well Screened in Glaciofluvial Aquifer

COC = contaminant of concern
PFAS = Per- and Polyfluoroalkyl Substances
MTCA CUL = Model Toxics Control Act Cleanup Level
DOH SAL = Department of Health State Action Level
EPA MCL = Environmental Protection Agency Maximum Contaminant Level
PFAS Screening Criteria = MTCA Method B CULs, DOH SALs and EPA MCLs (lowest value selected).

N W E S

400 0 400
Feet

Data Source: Aerial from ESRI Data Online. Water features from PNW Hydrography.
Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. Boundaries of landfill and mining land use were adapted from Fetrow Engineering (1991) based on Remedial Investigation explorations, aerial photography and test pit investigation data collected in November 2022. The Former Spokane County landfill boundaries have not been modified from Fetrow Engineering (1991).
4. Glaciofluvial unit boundary as estimated as part of the Remedial Investigation Report dated May 22, 2018.
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Groundwater Contours (March 2024)

Marshall Landfill
Spokane County, Washington

GeoEngineers

Figure 3

Appendices

Appendix A

Previous Groundwater Monitoring Results

Table A-1

Summary of Groundwater Monitoring Well Measurements

Marshall Landfill

Spokane County, Washington

Monitoring Well ID and Top of Casing Elevation[1] (feet)	Well Screen Interval (feet bTOC)	Measured Depth to Bottom of Well[2] (feet bTOC)	Aquifer	Date Measured	Depth to Groundwater (feet bTOC)	Groundwater Elevation[3] (feet)
MW-1A	199 to 209	210	Weathered Basement	12/14/2023	Dry	>210
2335.52				3/25/2024	205.55	2129.97
MW-2	73 to 83	83	Glaciofluvial	12/14/2023	Dry	>83
2176.05				3/25/2024	68.30	2107.75
MW-2A	93 to 108	108	Glaciofluvial	12/14/2023	93.33	2082.47
2175.80				3/25/2024	68.49	2107.31
MW-3	106 to 116	118	Glaciofluvial	12/14/2023	105.63	2076.67
2182.30				3/25/2024	84.75	2097.55
MW-4A	63 to 78	80	Glaciofluvial	12/14/2023	69.99	2089.27
2,159.26				3/25/2024	36.02	2123.24
MW-5A	124.5 to 139.5	143[4]	Glaciofluvial	12/14/2023	116.01	2071.45
2,187.46				3/25/2024	99.10	2088.36
MW-7B	288.5 to 298.5	299	Basement	12/14/2023	223.91	2103.57
2327.48				3/25/2024	218.30	2109.18
MW-7D	283 to 298	298	Basement	12/14/2023	214.17	2117.53
2331.70				3/25/2024	218.35	2113.35
MW-8A	104.5 to 119.5	122	Basement	12/14/2023	73.80	2065.85
2,139.65				3/25/2024	59.75	2079.90
MW-8B	64.5 to 89.5	94	Glaciofluvial	12/14/2023	73.77	2065.79
2139.56				3/25/2024	59.11	2080.45
MW-9A	43.5 to 68.5	72	Glaciofluvial	12/14/2023	65.05	2091.92
2,156.97				3/25/2024	28.89	2128.08
MW-11A	207.5 to 237.5	243	Weathered Basement	12/14/2023	218.96	2105.55
2,324.51				3/25/2024	208.10	2116.41
MW-12A	104.5 to 134.5	135	CRBG	12/14/2023	117.68	2235.68
2353.36				3/25/2024	101.75	2251.61
MW-14	242.3 to 252.3	255	Glaciofluvial	12/14/2023	221.53	2092.30
2,313.83				3/25/2024	203.30	2110.53
MW-15	160 to 175	179	Glaciofluvial	12/14/2023	161.83	2074.21
2236.04				3/25/2024	144.08	2091.96
MW-15A	192 to 202	205	Glaciofluvial	12/14/2023	162.97	2074.29
2,237.26				3/25/2024	142.88	2094.38
MW-16	69.5 to 86.5	89	Glaciofluvial	12/14/2023	82.85	2087.39
2170.24				3/25/2024	Not measured	–
MW-16A	111 to 126	132[5]	Basement	12/14/2023	Not measured	–
2167.89				3/25/2024	49.55	2118.34

Notes:

[1] Monitoring well locations are shown on Figures 2 and 3. Top of monitoring well casing elevations referenced to NAVD88 datum, as reported in the Remedial Investigation Report for the site dated May 22, 2018.

[2] Depth to bottom measured on December 14, 2023 unless otherwise noted.

[3] Groundwater elevations calculated using the formula: Groundwater Elevation = Top of Casing Elevation - Depth to Water

[4] Measured depth to bottom on August 9, 2024.

[5] Measured depth to bottom on August 8, 2024.

bTOC = below top of casing

CRBG = Columbia River Basalt Group

Table A-2

Summary of Water Quality Parameters

Marshall Landfill

Spokane County, Washington

Monitoring Well ID[1]	Date Measured	pH	Specific Conductivity (µS/cm)	Redox Potential (millivolts)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Temperature (degrees C)
MW-2A	12/15/23	7.19	0.5	-35.5	0.11	1.18	10.0
	03/26/24	6.65	549.0	102.5	3.30	12.66	9.1
MW-5A	12/15/23	7.19	0.5	-35.5	0.11	1.18	10.0
	03/26/24	6.65	549.0	102.5	2.20	12.66	9.1
MW-7B	12/14/23	7.25	0.3	-56.8	0.16	32.68	10.2
	03/27/24	6.73	291.1	79.2	0.36	1.7	12.4
MW-8A	03/26/24	7.08	426.0	118.4	5.31	62.8	10.3
MW-9A	03/26/24	6.77	498.5	136.2	5.88	2.85	4.9
MW-11A	12/14/23	7.18	0	76.2	9.41	2.7	9.3
MW-15A	03/25/24	6.47	644	95.3	0.27	221.48	13.0
MW-16A	03/26/24	6.90	620.0	29.7	0.37	1.90	10.1
MW-12A	12/14/23	7.59	0.2	76.9	10.01	2.65	10.3
	03/25/24	7.13	316.4	133.1	11.09	22.99	11.1

Notes:

[1] Monitoring well locations are shown on Figures 2 and 3.

µS/cm = microsiemens per centimeter; mg/L = milligrams per liter

NTU = Nephelometric Turbidity Unit; C = Celsius

Table A-3

Summary of Groundwater Chemical Analytical Results

Marshall Landfill

Spokane County, Washington

Location ID	MW-2A		MW-5A				MW-7B		MW-8A	MW-9A	MW-11A	MW-12A		MW-15A	MW-16A	MTCA	DOH	
Sample ID	MW-2A-121523	MW-2A-032524	MW-5A-121523	DUP-121523[2]	MW-5A-032524	DUP-032724	MW-7B-121423	MW-7B-032524	MW-8A-032524	MW-9A-032524	MW-11A-121423	MW-12A-121423	MW-12A-032524	MW-15A-032524	MW-16A-032524	Cleanup Level[3]	SAL[4]	EPA MCL[5]
Sample Date	12/15/2023	3/26/2024	12/15/2023		3/27/2024		12/14/2023	3/25/2024	3/26/2024	3/26/2024	12/14/2023	12/14/2023	3/25/2024	3/25/2024	3/25/2024			
Volatile Organic Compounds by EPA 8260D (µg/L)																		
1,1,1,2-Tetrachloroethane	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	240	NE	NE
1,1,1-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	–	–	1.0 U	1.0 U	1.0 U	–	–	200	NE	NE
1,1,2,2-Tetrachloroethane	2.0 U	–	2.0 U	2.0 U	–	–	2.0 U	–	–	–	2.0 U	2.0 U	–	–	–	160	NE	NE
1,1,2-Trichloroethane	2.0 U	–	2.0 U	2.0 U	–	–	2.0 U	–	–	–	2.0 U	2.0 U	–	–	–	32	NE	NE
1,1-Dichloroethane	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	1,600	NE	NE
1,1-Dichloroethene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	400	NE	NE
1,1-Dichloropropene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	240	NE	NE
1,2,3-Trichlorobenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	NE	NE	NE
1,2,3-Trichloropropane	2.0 U	–	2.0 U	2.0 U	–	–	2.0 U	–	–	–	2.0 U	2.0 U	–	–	–	32	NE	NE
1,2,4-Trichlorobenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	80	NE	NE
1,2,4-Trimethylbenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	80	NE	NE
1,2-Dibromo-3-Chloropropane	10.0 U	–	10.0 U	10.0 U	–	–	10.0 U	–	–	–	10.0 U	10.0 U	–	–	–	1.6	NE	NE
1,2-Dibromoethane (EDB)	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	0.01	NE	NE
1,2-Dichlorobenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	720	NE	NE
1,2-Dichloroethane	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	5	NE	NE
1,2-Dichloropropane	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	32	NE	NE
1,3,5-Trimethylbenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	80	NE	NE
1,3-Dichlorobenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	NE	NE	NE
1,3-Dichloropropane	2.0 U	–	2.0 U	2.0 U	–	–	2.0 U	–	–	–	2.0 U	2.0 U	–	–	–	160	NE	NE
1,4-Dichlorobenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	560	NE	NE
2,2-Dichloropropane	2.0 U	–	2.0 U	2.0 U	–	–	2.0 U	–	–	–	2.0 U	2.0 U	–	–	–	NE	NE	NE
2-Chlorotoluene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	160	NE	NE
4-Chlorotoluene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	160	NE	NE
Benzene	0.40 U	–	0.40 U	0.40 U	–	–	0.40 U	–	–	–	0.40 U	0.40 U	–	–	–	5	NE	NE
Bromobenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	64	NE	NE
Bromochloromethane	2.0 U	–	2.0 U	2.0 U	–	–	2.0 U	–	–	–	2.0 U	2.0 U	–	–	–	NE	NE	NE
Bromodichloromethane	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	160	NE	NE
Bromoform	5.0 U	–	5.0 U	5.0 U	–	–	5.0 U	–	–	–	5.0 U	5.0 U	–	–	–	160	NE	NE
Bromomethane	5.0 U	–	5.0 U	5.0 U	–	–	5.0 U	–	–	–	5.0 U	5.0 U	–	–	–	11	NE	NE
Carbon Tetrachloride	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	32	NE	NE
Chlorobenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	160	NE	NE
Chloroethane	2.0 U	–	2.0 U	2.0 U	–	–	2.0 U	–	–	–	2.0 U	2.0 U	–	–	–	NE	NE	NE
Chloroform	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	80	NE	NE
Chloromethane	3.0 U	–	3.0 U	3.0 U	–	–	3.0 U	–	–	–	3.0 U	3.0 U	–	–	–	NE	NE	NE
cis-1,2-Dichloroethene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	16	NE	NE
cis-1,3-Dichloropropene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	NE	NE	NE
Dibromochloromethane	2.0 U	–	2.0 U	2.0 U	–	–	2.0 U	–	–	–	2.0 U	2.0 U	–	–	–	160	NE	NE
Dibromomethane	2.0 U	–	2.0 U	2.0 U	–	–	2.0 U	–	–	–	2.0 U	2.0 U	–	–	–	NE	NE	NE
Dichlorodifluoromethane	2.0 U	–	2.0 U	2.0 U	–	–	2.0 U	–	–	–	2.0 U	2.0 U	–	–	–	1,600	NE	NE
Ethylbenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	700	NE	NE
Hexachlorobutadiene	2.0 U	–	2.0 U	2.0 U	–	–	2.0 U	–	–	–	2.0 U	2.0 U	–	–	–	8	NE	NE
Isopropylbenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	NE	NE	NE
m,p-Xylene	2.0 U	–	2.0 U	2.0 U	–	–	2.0 U	–	–	–	2.0 U	2.0 U	–	–	–	NE	NE	NE
Methyl tert-butyl ether	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	20	NE	NE
Methylene Chloride	5.0 U	–	5.0 U	5.0 U	–	–	5.0 U	–	–	–	5.0 U	5.0 U	–	–	–	5	NE	NE
Naphthalene	2.0 U	–	2.0 U	2.0 U	–	–	2.0 U	–	–	–	2.0 U	2.0 U	–	–	–	160	NE	NE
n-Butylbenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	400	NE	NE
N-Propylbenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	800	NE	NE
o-Xylene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	NE	NE	NE
p-Isopropyltoluene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	NE	NE	NE
Sec-Butylbenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	800	NE	NE
Styrene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	1,600	NE	NE
tert-Butylbenzene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	800	NE	NE
Tetrachloroethene	1.0 U	1.0 U	**0.84 J**	**0.80 J**	1.0 U	1.0 U	1.0 U	1.0 U	–	–	1.0 U	1.0 U	1.0 U	–	–	5	NE	NE
Toluene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	1,000	NE	NE
trans-1,2-Dichloroethene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	160	NE	NE
trans-1,3-Dichloropropene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	NE	NE	NE
Trichloroethene	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	5	NE	NE
Trichlorofluoromethane	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	2,400	NE	NE
Vinyl Chloride	1.0 U	–	1.0 U	1.0 U	–	–	1.0 U	–	–	–	1.0 U	1.0 U	–	–	–	0.2	NE	NE
Total Xylenes	ND	–	ND	ND	–	–	ND	–	–	–	ND	ND	–	–	–	1,000	NE	NE

Location ID	MW-2A		MW-5A				MW-7B		MW-8A	MW-9A	MW-11A	MW-12A		MW-15A	MW-16A	MTCA Cleanup Level[3]	DOH SAL[4]	EPA MCL[5]
Sample ID	MW-2A-121523	MW-2A-032524	MW-5A-121523	DUP-121523[2]	MW-5A-032524	DUP-032724	MW-7B-121423	MW-7B-032524	MW-8A-032524	MW-9A-032524	MW-11A-121423	MW-12A-121423	MW-12A-032524	MW-15A-032524	MW-16A-032524			
Sample Date	12/15/2023	3/26/2024	12/15/2023		3/27/2024		12/14/2023	3/25/2024	3/26/2024	3/26/2024	12/14/2023	12/14/2023	3/25/2024	3/25/2024	3/25/2024			
Semivolatile Organic Compounds and Polycyclic Aromatic Hydrocarbons by EPA 8270E (µg/L)																		
1,2,4-Trichlorobenzene	0.38 U	--	0.38 U	0.38 U	--	--	0.38 U	--	--	--	0.39 U	0.38 U	--	--	--	80	Ne	Ne
1,2-Dichlorobenzene	0.38 U	--	0.38 U	0.38 U	--	--	0.38 U	--	--	--	0.39 U	0.38 U	--	--	--	720	NE	NE
1,3-Dichlorobenzene	0.38 U	--	0.38 U	0.38 U	--	--	0.38 U	--	--	--	0.39 U	0.38 U	--	--	--	NE	NE	NE
1,4-Dichlorobenzene	0.38 U	--	0.38 U	0.38 U	--	--	0.38 U	--	--	--	0.39 U	0.38 U	--	--	--	560	NE	NE
1,4 Dioxane	--	0.19 U	--	--	0.19 U	0.21 U	--	0.18 UJ	--	--	--	--	0.19 U	--	--	NE	NE	NE
1-Methylnaphthalene	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	160	NE	NE
2,4,5-Trichlorophenol	0.38 U	--	0.38 U	0.38 U	--	--	0.38 U	--	--	--	0.39 U	0.38 U	--	--	--	1,600	NE	NE
2,4,6-Trichlorophenol	0.57 U	--	0.57 U	0.57 U	--	--	0.57 U	--	--	--	0.57 U	0.57 U	--	--	--	16	NE	NE
2,4-Dichlorophenol	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	48	NE	NE
2,4-Dimethylphenol	3.8 U	--	3.8 U	3.8 U	--	--	3.8 U	--	--	--	3.9 U	3.8 U	--	--	--	48	NE	NE
2,4-Dinitrophenol	4.8 U	--	4.8 U	4.8 U	--	--	4.7 U	--	--	--	4.8 U	4.7 U	--	--	--	32	NE	NE
2,4-Dinitrotoluene	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	14	NE	NE
2,6-Dinitrotoluene	0.38 U	--	0.38 U	0.38 U	--	--	0.38 U	--	--	--	0.39 U	0.38 U	--	--	--	14	NE	NE
2-Chloronaphthalene	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	NE	NE	NE
2-Chlorophenol	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	40	NE	NE
2-Methylnaphthalene	0.38 U	--	0.38 U	0.38 U	--	--	0.38 U	--	--	--	0.39 U	0.38 U	--	--	--	160	NE	NE
2-Methylphenol	0.57 U	--	0.57 U	0.57 U	--	--	0.57 U	--	--	--	0.57 U	0.57 U	--	--	--	NE	NE	NE
2-Nitroaniline	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	160	NE	NE
2-Nitrophenol	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	NE	NE	NE
3 & 4 Methylphenol	0.57 U	--	0.57 U	0.57 U	--	--	0.57 U	--	--	--	0.57 U	0.57 U	--	--	--	NE	NE	NE
3,3'-Dichlorobenzidine	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	0.19	NE	NE
3-Nitroaniline	2.9 U	--	2.9 U	2.9 U	--	--	2.9 U	--	--	--	2.9 U	2.9 U	--	--	--	64	NE	NE
4,6-Dinitro-2-methylphenol	1.9 U	--	1.9 U	1.9 U	--	--	1.9 U	--	--	--	1.9 U	1.9 U	--	--	--	NE	NE	NE
4-Bromophenyl phenyl ether	0.57 U	--	0.57 U	0.57 U	--	--	0.57 U	--	--	--	0.57 U	0.57 U	--	--	--	NE	NE	NE
4-Chloro-3-methylphenol	0.57 U	--	0.57 U	0.57 U	--	--	0.57 U	--	--	--	0.57 U	0.57 U	--	--	--	NE	NE	NE
4-Chloroaniline	1.9 U	--	1.9 U	1.9 U	--	--	1.9 U	--	--	--	1.9 U	1.9 U	--	--	--	64	NE	NE
4-Chlorophenyl phenyl ether	0.57 U	--	0.57 U	0.57 U	--	--	0.57 U	--	--	--	0.57 U	0.57 U	--	--	--	NE	NE	NE
4-Nitroaniline	1.9 U	--	1.9 U	1.9 U	--	--	1.9 U	--	--	--	1.9 U	1.9 U	--	--	--	64	NE	NE
4-Nitrophenol	9.5 U	--	9.6 U	9.5 U	--	--	9.5 U	--	--	--	9.6 U	9.5 U	--	--	--	NE	NE	NE
Acenaphthene	0.38 U	--	0.38 U	0.38 U	--	--	0.38 U	--	--	--	0.39 U	0.38 U	--	--	--	480	NE	NE
Acenaphthylene	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	NE	NE	NE
Anthracene	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	2,400	NE	NE
Benzo[a]anthracene	0.24 U	--	0.24 U	0.24 U	--	--	0.24 U	--	--	--	0.24 U	0.24 U	--	--	--	NE	NE	NE
Benzo[a]pyrene	0.24 U	--	0.24 U	0.24 U	--	--	0.24 U	--	--	--	0.24 U	0.24 U	--	--	--	0.1	NE	NE
Benzo[b]fluoranthene	0.24 U	--	0.24 U	0.24 U	--	--	0.24 U	--	--	--	0.24 U	0.24 U	--	--	--	NE	NE	NE
Benzo[g,h,i]perylene	0.24 U	--	0.24 U	0.24 U	--	--	0.24 U	--	--	--	0.24 U	0.24 U	--	--	--	NE	NE	NE
Benzo[k]fluoranthene	0.24 U	--	0.24 U	0.24 U	--	--	0.24 U	--	--	--	0.24 U	0.24 U	--	--	--	NE	NE	NE
Benzoic acid	9.5 U	--	9.6 U	9.5 U	--	--	**3.0 J**	--	--	--	**3.0 J**	9.5 U	--	--	--	64,000	NE	NE
Benzyl alcohol	4.8 U	--	4.8 U	4.8 U	--	--	4.7 U	--	--	--	4.8 U	4.7 U	--	--	--	1,600	NE	NE
Bis(2-chloroethoxy)methane	0.57 U	--	0.57 U	0.57 U	--	--	0.57 U	--	--	--	0.57 U	0.57 U	--	--	--	48	NE	NE
Bis(2-chloroethyl)ether	0.095 U	--	0.096 U	0.095 U	--	--	0.095 U	--	--	--	0.096 U	0.095 U	--	--	--	0.04	NE	NE
Bis(2-ethylhexyl) phthalate	2.9 U	--	2.9 U	2.9 U	--	--	2.9 U	--	--	--	2.9 U	2.9 U	--	--	--	320	NE	NE
bis(chloroisopropyl) ether	0.24 U	--	0.24 U	0.24 U	--	--	0.24 U	--	--	--	0.24 U	0.24 U	--	--	--	NE	NE	NE
Butyl benzyl phthalate	3.8 U	--	3.8 U	3.8 U	--	--	3.8 U	--	--	--	3.9 U	3.8 U	--	--	--	3,200	NE	NE
Carbazole	0.57 U	--	0.57 U	0.57 U	--	--	0.57 U	--	--	--	0.57 U	0.57 U	--	--	--	NE	NE	NE
Chrysene	0.24 U	--	0.24 U	0.24 U	--	--	0.24 U	--	--	--	0.24 U	0.24 U	--	--	--	NE	NE	NE
Dibenz(a,h)anthracene	0.24 U	--	0.24 U	0.24 U	--	--	0.24 U	--	--	--	0.24 U	0.24 U	--	--	--	NE	NE	NE
Dibenzofuran	0.38 U	--	0.38 U	0.38 U	--	--	0.38 U	--	--	--	0.39 U	0.38 U	--	--	--	8	NE	NE
Diethyl phthalate	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	13,000	NE	NE
Dimethyl phthalate	0.57 U	--	0.57 U	0.57 U	--	--	0.57 U	--	--	--	0.57 U	0.57 U	--	--	--	NE	NE	NE
Di-n-butyl phthalate	9.5 U	--	9.6 U	9.5 U	--	--	9.5 U	--	--	--	9.6 U	9.5 U	--	--	--	NE	NE	NE
Di-n-octyl phthalate	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	160	NE	NE
Fluoranthene	0.24 U	--	0.24 U	0.24 U	--	--	0.24 U	--	--	--	0.24 U	0.24 U	--	--	--	640	NE	NE
Fluorene	0.24 U	--	0.24 U	0.24 U	--	--	0.24 U	--	--	--	0.24 U	0.24 U	--	--	--	320	NE	NE
Hexachlorobenzene	0.57 U	--	0.57 U	0.57 U	--	--	0.57 U	--	--	--	0.57 U	0.57 U	--	--	--	6.4	NE	NE
Hexachlorobutadiene	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	8	NE	NE
Hexachlorocyclopentadiene	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	48	NE	NE
Hexachloroethane	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	NE	NE	NE
Indeno[1,2,3-cd]pyrene	0.38 U	--	0.38 U	0.38 U	--	--	0.38 U	--	--	--	0.39 U	0.38 U	--	--	--	NE	NE	NE
Isophorone	0.38 U	--	0.38 U	0.38 U	--	--	0.38 U	--	--	--	0.39 U	0.38 U	--	--	--	NE	NE	NE
Naphthalene	0.38 U	--	0.38 U	0.38 U	--	--	0.38 U	--	--	--	0.39 U	0.38 U	--	--	--	160	NE	NE
Nitrobenzene	0.95 U	--	0.95 U	0.95 U	--	--	0.95 U	--	--	--	0.95 U	0.95 U	--	--	--	3,200	NE	NE
N-Nitrosodi-n-propylamine	0.38 U	--	0.38 U	0.38 U	--	--	0.38 U	--	--	--	0.39 U	0.38 U	--	--	--	0.013	NE	NE
N-Nitrosodiphenylamine	0.95 U	--	0.96 U	0.95 U	--	--	0.95 U	--	--	--	0.96 U	0.95 U	--	--	--	18	NE	NE
Pentachlorophenol	4.8 U	--	4.8 U	4.8 U	--	--	4.7 U	--	--	--	4.8 U	4.7 U	--	--	--	80	NE	NE

Location ID	MW-2A		MW-5A				MW-7B		MW-8A	MW-9A	MW-11A	MW-12A		MW-15A	MW-16A	MTCA Cleanup Level[3]	DOH SAL[4]	EPA MCL[5]
Sample ID	MW-2A-121523	MW-2A-032524	MW-5A-121523	DUP-121523[2]	MW-5A-032524	DUP-032724	MW-7B-121423	MW-7B-032524	MW-8A-032524	MW-9A-032524	MW-11A-121423	MW-12A-121423	MW-12A-032524	MW-15A-032524	MW-16A-032524			
Sample Date	12/15/2023	3/26/2024	12/15/2023		3/27/2024		12/14/2023	3/25/2024	3/26/2024	3/26/2024	12/14/2023	12/14/2023	3/25/2024	3/25/2024	3/25/2024			
Phenanthrene	0.95 U	–	0.96 U	0.95 U	–	–	0.95 U	–	–	–	0.96 U	0.95 U	–	–	–	NE	NE	NE
Phenol	0.95 U	–	0.96 U	0.95 U	–	–	0.95 U	–	–	–	0.96 U	0.95 U	–	–	–	4,800	NE	NE
Pyrene	0.95 U	–	0.96 U	0.95 U	–	–	0.95 U	–	–	–	0.96 U	0.95 U	–	–	–	240	NE	NE
cPAH TEC[6]	ND	–	ND	ND	–	–	ND	–	–	–	ND	ND	–	–	–	0.1	NE	NE
Herbicides by EPA 8151A (µg/L)																		
2,4,5-T	0.48 UJ	–	0.49 UJ	0.48 UJ	–	–	0.48 UJ	–	–	–	0.48 UJ	0.47 UJ	–	–	–	NE	NE	NE
2,4,5-TP (Silvex)	0.48 UJ	–	0.49 UJ	0.48 UJ	–	–	0.48 UJ	–	–	–	0.48 UJ	0.47 UJ	–	–	–	130	NE	NE
2,4-D	4.8 UJ	–	4.9 UJ	4.8 UJ	–	–	4.8 UJ	–	–	–	4.8 UJ	4.7 UJ	–	–	–	NE	NE	NE
2,4-DB	4.8 UJ	–	4.9 UJ	4.8 UJ	–	–	4.8 UJ	–	–	–	4.8 UJ	4.7 UJ	–	–	–	NE	NE	NE
Dalapon	12 UJ	–	12 UJ	12 UJ	–	–	12 UJ	–	–	–	12 UJ	12 UJ	–	–	–	480	NE	NE
Dicamba	0.48 UJ	–	0.49 UJ	0.48 UJ	–	–	0.48 UJ	–	–	–	0.48 UJ	0.47 UJ	–	–	–	480	NE	NE
Dichlorprop	4.8 UJ	–	4.9 UJ	4.8 UJ	–	–	4.8 UJ	–	–	–	4.8 UJ	4.7 UJ	–	–	–	NE	NE	NE
Dinoseb	2.4 UJ	–	2.4 UJ	2.4 UJ	–	–	2.4 UJ	–	–	–	2.4 UJ	2.4 UJ	–	–	–	16	NE	NE
MCPA	480 UJ	–	490 UJ	480 UJ	–	–	480 UJ	–	–	–	480 UJ	470 UJ	–	–	–	NE	NE	NE
MCPP	480 UJ	–	490 UJ	480 UJ	–	–	480 UJ	–	–	–	480 UJ	470 UJ	–	–	–	NE	NE	NE
Per- and Polyfluoroalkyl Substances by EPA Draft-4 1633 (ng/L)																		
Perfluorobutanoic acid (PFBA)	**5.6 J**	7.2 U	**23**	**22**	**19**	**19**	**11**	**4.3 J**	**14**	7.1 U	7.2 U	**4.9 J**	–	**53**	**2.6 J**	8,000	NE	NE
Perfluoropentanoic acid (PFPeA)	**3.1 J**	3.6 U	**17**	**17**	**13**	**13**	**9.1**	**3.6 J**	**22**	3.6 U	3.6 U	**1.6 J**	–	**28**	**2.1 J**	NE	NE	NE
Perfluorohexanoic acid (PFHxA)	**1.5 J**	1.8 U	**27**	**29**	**24**	**23**	**3.9**	**1.4 J**	**7.4**	1.8 U	1.8 U	**1.1 J**	–	**8.7**	**1.0 J**	8,000	NE	NE
Perfluoroheptanoic acid (PFHpA)	**1.3 J**	1.8 U	**20**	**20**	**21**	**19**	**1.8**	**0.77 J**	**2.8**	1.8 U	1.8 U	**0.82 J**	–	**5.2**	1.8 U	NE	NE	NE
Perfluorooctanoic acid (PFOA)	**7.6**	1.8 U	**53**	**56**	**39**	**38**	**0.57 J**	2.1 U	**4.4**	**0.70 J**	1.8 U	**0.85 J**	–	**5.8**	**1.5 J**	0.48	10	4
Perfluorononanoic acid (PFNA)	**0.90 J**	1.8 U	**2.1**	**2.2**	**1.0 J**	**1.1 J**	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	**1.6 J**	1.8 U	40	9	10
Perfluorodecanoic acid (PFDA)	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
Perfluoroundecanoic acid (PFUnA)	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
Perfluorododecanoic acid (PFDoA)	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
Perfluorotridecanoic acid (PFTrDA)	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
Perfluorotetradecanoic acid (PFTeDA)	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
Perfluorobutanesulfonic acid (PFBS)	**4.2**	**0.98 J**	**14**	**14**	**7.8**	**8.3**	1.8 U	2.1 U	**1.7 J**	**3.3**	**0.50 J**	**0.86 J**	–	**4.0**	1.8 U	4,800	345	NE
Perfluoropentanesulfonic acid (PFPeS)	1.8 U	1.8 U	**10**	**11**	**2.5**	**2.3**	1.8 U	2.1 U	**0.61 J**	1.8 U	1.8 U	1.8 U	–	0.8 U	1.8 U	NE	NE	NE
Perfluorohexanesulfonic acid (PFHxS)	**2.6**	**0.58 J**	**49**	**46**	**9.3**	**8.8**	1.8 U	2.1 U	**2.4**	**1.3 J**	**0.48 J**	1.8 U	–	**2.1**	1.8 U	160	65	10
Perfluoroheptanesulfonic acid (PFHpS)	1.8 U	1.8 U	**0.77 J**	**0.70 J**	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
Perfluorooctanesulfonic acid (PFOS)	**11**	**2.7**	**29**	**27**	**15**	**15**	**0.58 J**	2.1 U	**3.0**	**1.9**	1.8 U	1.8 U	–	**9.9**	**2.6**	1.6	15	4
Perfluorononanesulfonic acid (PFNS)	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
Perfluorodecanesulfonic acid (PFDS)	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
Perfluorododecanesulfonic acid (PFDoS)	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	7.2 U	7.2 U	7.3 U	7.6 U	7.2 U	7.4 U	7.2 U	8.4 U	7.4 U	7.1 U	7.2 U	7.2 U	–	7.3 U	7.3 U	NE	NE	NE
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	7.2 U	7.2 U	7.3 U	7.6 U	7.2 U	7.4 U	7.2 U	8.4 U	7.4 U	7.1 U	7.2 U	7.2 U	–	7.3 U	7.3 U	NE	NE	NE
Perfluorooctanesulfonamide (PFOSA)	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
N-methylperfluorooctane sulfonamide (NMeFOSA)	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
N-ethylperfluorooctane sulfonamide (NEtFOSA)	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.8 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	–	1.8 U	1.8 U	NE	NE	NE
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	18 U	18 U	18 U	19 U	18 U	19 U	18 U	21 U	18 U	18 U	18 U	18 U	–	18 U	18 U	NE	NE	NE
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	18 U	18 U	18 U	19 U	18 U	19 U	18 U	21 U	18 U	18 U	18 U	18 U	–	18 U	18 U	NE	NE	NE
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	7.2 U	7.2 U	7.3 U	7.6 U	7.2 U	7.4 U	7.2 U	8.4 U	7.4 U	7.1 U	7.2 U	7.2 U	–	7.3 U	7.3 U	24	NE	10
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.2 U	7.2 U	7.3 U	7.6 U	7.2 U	7.4 U	7.2 U	8.4 U	7.4 U	7.1 U	7.2 U	7.2 U	–	7.3 U	7.3 U	NE	NE	NE
Perfluoro-3-methoxypropanoic acid (PFMPA)	3.6 U	3.6 U	3.6 U	3.8 U	3.6 U	3.7 U	3.6 U	4.2 U	3.7 U	3.6 U	3.6 U	3.6 U	–	3.6 U	3.7 U	NE	NE	NE
Perfluoro-4-methoxybutanoic acid (PFMBA)	3.6 U	3.6 U	3.6 U	3.8 U	3.6 U	3.7 U	3.6 U	4.2 U	3.7 U	3.6 U	3.6 U	3.6 U	–	3.6 U	3.7 U	NE	NE	NE
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	3.6 U	3.6 U	3.6 U	3.8 U	3.6 U	3.7 U	3.6 U	4.2 U	3.7 U	3.6 U	3.6 U	3.6 U	–	3.6 U	3.7 U	NE	NE	NE
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	7.2 U	7.2 U	7.3 U	7.6 U	7.2 U	7.4 U	7.2 U	8.4 U	7.4 U	7.1 U	7.2 U	7.2 U	–	7.3 U	7.3 U	NE	NE	NE
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	7.2 U	7.2 U	7.3 U	7.6 U	7.2 U	7.4 U	7.2 U	8.4 U	7.4 U	7.1 U	7.2 U	7.2 U	–	7.3 U	7.3 U	NE	NE	NE
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	3.6 U	3.6 U	3.6 U	3.8 U	3.6 U	3.7 U	3.6 U	4.2 U	3.7 U	3.6 U	3.6 U	3.6 U	–	3.6 U	3.7 U	NE	NE	NE
3-Perfluoropropylpropanoic acid (3:3 FTCA)	9.0 U	9.0 U	9.0 U	9.5 U	8.9 U	9.3 U	9.0 U	10.0 U	9.2 U	8.9 U	9.0 U	9.1 U	–	9.1 U	9.2 U	NE	NE	NE
3-Perfluoropentylpropanoic acid (5:3 FTCA)	45 U	45 U	45 U	48 U	45 U	46 U	45 U	52 U	46 U	45 U	45 U	45 U	–	46 U	46 U	NE	NE	NE
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	45 U	45 U	45 U	48 U	45 U	46 U	45 U	52 U	46 U	45 U	45 U	45 U	–	46 U	46 U	NE	NE	NE
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	7.2 U	7.2 U	7.3 U	7.6 U	7.2 U	7.4 U	7.2 U	8.4 U	7.4 U	7.1 U	7.2 U	7.2 U	–	7.3 U	7.3 U	NE	NE	NE
Total Metals by EPA 6020B (mg/L)																		
Arsenic	**0.0020 J**	**0.0018 J**	**0.0011 J**	**0.0011 J**	**0.0012 J**	**0.0014 J**	0.0050 U	0.0050 U	–	–	**0.0021 J**	0.0050 U	0.0050 U	–	–	0.005	0.005	NE
Cadmium	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	–	–	0.0020 U	0.0020 U	0.0020 U	–	–	0.005	0.005	NE
Iron	0.50 U	0.50 U	**0.095 J**	**0.10 J**	0.50 U	0.50 U	**0.21 J**	**0.13 J**	–	–	**0.13 J**	0.50 U	0.50 U	–	–	11	11	NE
Lead	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	**0.0015 J**	**0.00088 J**	–	–	0.0020 U	0.0020 U	0.0020 U	–	–	0.015	0.015	NE
Manganese	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	**0.0068 J**	**0.0050 J**	–	–	**0.0025 J**	0.010 U	0.010 U	–	–	0.75	0.75	NE
Zinc	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	**0.018 J**	**0.0055 J**	–	–	0.035 U	**0.0051 J**	0.035 U	–	–	4.8	4.8	NE

Location ID	MW-2A		MW-5A				MW-7B		MW-8A	MW-9A	MW-11A	MW-12A		MW-15A	MW-16A	MTCA Cleanup Level[3]	DOH SAL[4]	EPA MCL[5]
Sample ID	MW-2A-121523	MW-2A-032524	MW-5A-121523	DUP-121523[2]	MW-5A-032524	DUP-032724	MW-7B-121423	MW-7B-032524	MW-8A-032524	MW-9A-032524	MW-11A-121423	MW-12A-121423	MW-12A-032524	MW-15A-032524	MW-16A-032524			
Sample Date	12/15/2023	3/26/2024	12/15/2023		3/27/2024		12/14/2023	3/25/2024	3/26/2024	3/26/2024	12/14/2023	12/14/2023	3/25/2024	3/25/2024	3/25/2024			
Total Metals by EPA 7470A (µg/L)																		
Mercury	0.20 U	**0.12 J**	0.20 U	0.20 U	**0.13 J**	**0.13 J**	0.20 U	**0.12 J**	--	--	0.20 U	0.20 U		--	--	2	2	NE
Dissolved Metals[7] by EPA 6020B (mg/L)																		
Arsenic	**0.0024 J**	**0.0019 J**	**0.0014 J**	**0.0014 J**	**0.0012 J**	**0.0013 J**	0.0050 U	0.0050 U	--	--	**0.0020 J**	0.0050 U	0.0050 U	--	--	0.005	0.005	NE
Cadmium	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	--	--	0.0020 U	0.0020 U	0.0020 U	--	--	0.005	0.005	NE
Iron	0.50 U	0.50 U	**0.074 J**	**0.078 J**	0.50 U	0.50 U	0.50 U	0.50 U	--	--	0.50 U	0.50 U	0.50 U	--	--	11	11	NE
Lead	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	--	--	0.0020 U	0.0020 U	0.0020 U	--	--	0.015	0.015	NE
Manganese	0.010 U	**0.013**	0.010 U	**0.0024 J**	0.010 U	0.010 U	0.010 U	**0.0078 J**	--	--	0.010 U	**0.0060 J**	0.010 U	--	--	0.75	0.75	NE
Zinc	0.035 U	0.035 U	0.035 U	**0.040**	0.035 U	0.035 U	**0.014 J**	**0.0046 J**	--	--	**0.0051 J**	0.035 U	0.035 U	--	--	4.8	4.8	NE
Dissolved Metals[7] by EPA 7470A (µg/L)																		
Mercury	0.20 U	**0.12 J**	0.20 U	0.20 U	**0.13 J**	**0.13 J**	0.20 U	**0.13 J**	--	--	0.20 U	0.20 U	**0.13 J**	--	--	2	2	NE
General Chemistry Parameters (mg/L), method noted in parentheses																		
Ammonia as Nitrogen (EPA 350.1)	**0.042 J**	0.10 U	**0.052 J**	**0.037 J**	0.10 U	0.10 U	**0.032 J**	0.10 U	--	--	**0.15**	0.10 U	0.10 U	--	--	NE	NE	NE
Alkalinity (SM 2320B)	**210**	**200**	**320**	**330**	**340**	**330**	**150**	**160**	--	--	**140**	**85**	**110**	--	--	NE	NE	NE
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**210**	**200**	**320**	**330**	**340**	**330**	**150**	**160**	--	--	**140**	**85**	**110**	--	--	NE	NE	NE
Total Dissolved Solids (SM 2540C)	**340**	**340**	**520**	**530**	**540**	**520**	**240**	**230**	--	--	**300**	**140**	**140**	--	--	NE	NE	NE
Cyanide, Weak Acid Dissociable (SM 4500 CN I)	0.010 U	--	0.010 U	0.010 U	--	--	0.010 U	--	--	--	0.010 U	0.010 U	--	--	--	0.005	0.005	NE
Total Organic Carbon (SM 5310B)	**4.2**	**3.1**	**2.0**	**2.0**	**2.5**	**2.3**	**4.3**	**0.78 J**	--	--	**0.84 J**	**2.6**	**2.8**	--	--	NE	NE	NE
Total Magnesium (EPA 6010D)	**16**	**16**	**16**	**16**	**11**	**11**	**10**	**11**	--	--	**9.5**	**8.9**	**11**	--	--	NE	NE	NE
Dissolved Magnesium (EPA 6010D)	**17**	**13**	**17**	**16**	**10**	**10**	**10**	**10**	--	--	**9.4**	**8.8**	**10**	--	--	NE	NE	NE
Total Potassium (EPA 6010D)	**7.8**	**6.8**	**4.9**	**4.8**	**3.8**	**3.8**	**1.7**	**1.6**	--	--	**2.8**	**2.7**	**2.6**	--	--	NE	NE	NE
Total Sodium (EPA 6010D)	**42**	**37**	**28**	**27**	**27**	**27**	**5.3**	**4.0**	--	--	**9.0**	**8.5**	**8.6**	--	--	NE	NE	NE
Dissolved Calcium (EPA 6010D)	**41**	**32**	**120**	**110**	**71**	**72**	**34**	**34**	--	--	**41**	**25**	**29**	--	--	NE	NE	NE
Chloride (EPA 300.0)	**59**	**62**	**33**	**34**	**54**	**57**	**0.58 J**	**0.70 J**	--	--	**9.8**	**3.3**	**6.7**	--	--	NE	NE	NE
Nitrate as N (EPA 300.0)	0.20 U	**2.4**	**5.7**	**5.6**	**1.4**	**1.9**	0.20 U	0.20 U	--	--	**3.4**	**6.8**	**8.1**	--	--	26	26	NE
Nitrite as N (EPA 300.0)	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.43**	0.20 U	0.20 U	--	--	0.20 U	0.20 U	0.20	--	--	1.6	1.6	NE
Sulfate (EPA 300.0)	**14**	**21**	**46**	**47**	**14**	**14**	**4.0**	**3.9**	--	--	**10**	**16**	**16**	--	--	NE	NE	NE

Notes:

[1] Samples analyzed by Eurofins Environment Testing located in Spokane Valley, Washington. Sample locations are shown on Figures 2 and 3.

[2] Duplicate sampling procedures are summarized in the Work Plan for Marshall Landfill Groundwater Monitoring dated November 17, 2023. Other quality assurance/quality control sampling (not shown) included trip blank and field blank sampling and analysis. Analyzed contaminants of concern were not detected above laboratory reporting limits in the trip blank or field blank (see laboratory reports).

[3] MTCA Method A or B Cleanup Level.

[4] DOH SAL for PFAS compounds are listed where available.

[5] EPA MCL for PFAS compounds are listed where available.

[6] Carcinogenic polycyclic aromatic hydrocarbon (cPAH) total toxic equivalent concentration (TEC) calculated per WAC 173-340-708.

[7] Samples submitted for dissolved metals analysis were lab filtered.

J = estimated concentration; refer to laboratory and data validation reports for data qualifier information and discussion (Appendices C and D respectively).

mg/L = milligrams per liter; µg/L = micrograms per liter; ng/L = nanogram per liter; ND = non detected; NE = not established; U = analyte was not detected above the laboratory reporting limit; "--" = not analyzed.

MTCA CUL = Model Toxics Control Act Cleanup Level (Method A or B)

DOH SAL = Washington State Department of Health State Action Level

EPA MCL = Environmental Protection Agency Maximum Contaminant Level

Bold indicates analyte was detected above the laboratory reporting limit.

Bold with grey shading indicates the analyte was detected at a concentration greater than the lowest listed screening criteria (MTCA CUL, DOH SAL or EPA MCL).

Appendix B

Chemical Analytical Laboratory Report

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Justin Orr
GeoEngineers Inc
523 East Second Ave
Spokane, Washington 99202

Generated 8/28/2024 11:51:11 AM Revision 1

JOB DESCRIPTION

Marshall Landfill/0504-104-01

JOB NUMBER

590-23966-1

Eurofins Spokane
11922 East 1st Ave
Spokane WA 99206

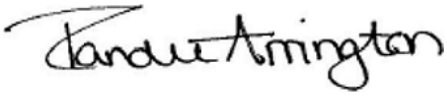
See page two for job notes and contact information.

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 Northwest, LLC Project Manager.

Authorization



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Revision 1

Authorized for release by
Randee Arrington, Business Unit Manager
Randee.Arrington@et.eurofinsus.com
(509)924-9200

Table of Contents

Job Narrative
590-23966-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Revision
The report being provided is a revision of the original report sent on 4/11/2024. The report (revision 1) is being revised due to: revised the client sample IDs for the following samples per the clients request:

MW-15-032524 revised to MW-15A-032524 (590-23966-2)
MW-8B-032624 revised to MW-8A-032624 (590-23966-4)
MW-16-032624 revised to MW-16A-032624 (590-23966-6)

Receipt
The samples were received on 3/28/2024 8:37 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 2.3°C, 2.5°C, 5.4°C and 5.9°C.

Receipt Exceptions
The containers for the methods SM5310B TOC/350.1 Ammonia/8270E 1,4 Dioxin/8260D PCE + 1,11,-TCA for the following sample were received at 12:25 on 03/28/2024: MW-5A-032524 (590-23966-8). The temperature upon receipt was 5.4 Corr IR006.

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

GC/MS Semi VOA
Method 8270C_SIM_MS_ID: The method blank for preparation batch 580-455296 and analytical batch 580-455319 contained 1,4-Dioxane above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL) in the method blank; therefore, re-extraction and re-analysis of samples was not performed.

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

HPLC/IC
Method 300_ORGFMS: The following sample was received outside of holding time: MW-12A-032524 (590-23966-1).

Method 300_ORGFMS: The following sample was received with less than 3 hours remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: MW-2A-032524 (590-23966-3).

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

PFAS
Method 1633: The following samples in preparation batch 320-752267 were yellow in color following extraction. MW-15-032524 (590-23966-2), MW-2A-032524 (590-23966-3), MW-9A-032524 (590-23966-5), MW-16-032524 (590-23966-6), MW-5A-032524 (590-23966-8) and DUP-032724 (590-23966-9)

Method 1633: The "I" qualifier means the transition mass ratio for the indicated analyte was outside the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty, however, analyst judgment was used to positively identify the analyte. The sample was re-analyzed with concurring results, therefore, the best set of data was reported. MW-9A-032524 (590-23966-5)

Method 1633: The CCB for analytical batch 320-752549 contained 1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS) above the detection limit. None of the samples associated with this CCB contained the target compound; therefore, re-analysis of sample was not performed:(CCB 320-752549/43).

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

Metals

Method 6010D - Dissolved: The sample duplicate (DUP) precision for preparation batch 590-46752 and 590-46762 and analytical batch 590-46765 was outside control limits. Sample matrix interference is suspected.

Method 7470A: The method blank for preparation batch 590-46752, 590-46761 and 590-46753 and analytical batch 590-46767 contained Mercury above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed.

Method 7470A - Dissolved: The method blank for preparation batch 590-46752, 590-46761 and 590-46753 and analytical batch 590-46767 contained Mercury above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed.

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

General Chemistry

Method 2320B: The method blank for analytical batch 590-46763 contained Alkalinity and Bicarbonate Alkalinity as CaCO3 above the method detection limit (MDL) Associated sample(s) were not re-extracted and/or re-analyzed because results were greater than 10X the value found in the method blank.

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

Sample Summary

Client: GeoEngineers Inc
Project/Site: Marshall Landfill/0504-104-01

Job ID: 590-23966-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-23966-1	MW-12A-032524	Water	03/25/24 13:06	03/28/24 08:37
590-23966-2	MW-15A-032524	Water	03/25/24 11:40	03/28/24 08:37
590-23966-3	MW-2A-032524	Water	03/26/24 11:25	03/28/24 08:37
590-23966-4	MW-8A-032524	Water	03/26/24 12:35	03/28/24 08:37
590-23966-5	MW-9A-032524	Water	03/26/24 13:40	03/28/24 08:37
590-23966-6	MW-16A-032524	Water	03/26/24 14:36	03/28/24 08:37
590-23966-7	MW-7B-032524	Water	03/27/24 09:25	03/28/24 08:37
590-23966-8	MW-5A-032524	Water	03/27/24 10:45	03/28/24 08:37
590-23966-9	DUP-032724	Water	03/27/24 12:00	03/28/24 08:37
590-23966-10	FB-032524	Water	03/25/24 11:06	03/28/24 08:37
590-23966-11	TB-2/26	Water	03/26/24 00:00	03/28/24 08:37

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
*5-	Isotope dilution analyte is outside acceptance limits, low biased.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
H3	Sample was received and analyzed past holding time. This does not meet regulatory requirements.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

LCMS

Qualifier	Qualifier Description
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F3	Duplicate RPD exceeds the control limit
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
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

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
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

Client Sample ID: MW-12A-032524

Date Collected: 03/25/24 13:06
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-1

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.17	ug/L			04/05/24 15:38	1
Tetrachloroethene	ND		1.0	0.22	ug/L			04/05/24 15:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*80 - 120*		*04/05/24 15:38*	*1*
4-Bromofluorobenzene (Surr)	*111*		*76 - 120*		*04/05/24 15:38*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 123*		*04/05/24 15:38*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*04/05/24 15:38*	*1*

Method: SW846 8270C SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.033	ug/L		04/01/24 09:03	04/01/24 17:20	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*38*	**5-*	*40 - 140*	*04/01/24 09:03*	*04/01/24 17:20*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**6.7**		0.80	0.42	mg/L			03/28/24 11:53	1
Nitrate as N	**8.1**	**H H3**	0.20	0.057	mg/L			03/28/24 11:53	1
Nitrite as N	ND	H H3	0.20	0.069	mg/L			03/28/24 11:53	1
Sulfate	**16**		0.50	0.13	mg/L			03/28/24 11:53	1

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Magnesium	**11**		1.0	0.13	mg/L		04/11/24 12:24	04/11/24 13:43	1
Potassium	**2.6**		0.50	0.29	mg/L		04/11/24 12:24	04/11/24 13:43	1
Sodium	**8.6**		0.50	0.20	mg/L		04/11/24 12:24	04/11/24 13:43	1

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	**29**		2.0	0.20	mg/L		04/11/24 10:49	04/11/24 14:45	1
Magnesium	**10**		1.0	0.13	mg/L		04/11/24 10:49	04/11/24 14:45	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0010	mg/L		04/05/24 16:45	04/08/24 23:54	5
Cadmium	ND		0.0020	0.00019	mg/L		04/05/24 16:45	04/08/24 23:54	5
Iron	ND		0.50	0.067	mg/L		04/05/24 16:45	04/08/24 23:54	5
Lead	ND		0.0020	0.00020	mg/L		04/05/24 16:45	04/08/24 23:54	5
Manganese	ND		0.010	0.0023	mg/L		04/05/24 16:45	04/08/24 23:54	5
Zinc	ND		0.035	0.0046	mg/L		04/05/24 16:45	04/08/24 23:54	5

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0010	mg/L		04/01/24 17:48	04/04/24 16:44	5
Cadmium	ND		0.0020	0.00019	mg/L		04/01/24 17:48	04/04/24 16:44	5
Iron	ND		0.50	0.067	mg/L		04/01/24 17:48	04/04/24 16:44	5
Lead	ND		0.0020	0.00020	mg/L		04/01/24 17:48	04/04/24 16:44	5
Manganese	ND		0.010	0.0023	mg/L		04/01/24 17:48	04/04/24 16:44	5
Zinc	ND		0.035	0.0046	mg/L		04/01/24 17:48	04/04/24 16:44	5

Client Sample ID: MW-12A-032524

Lab Sample ID: 590-23966-1

Date Collected: 03/25/24 13:06

Matrix: Water

Date Received: 03/28/24 08:37

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.12**	**J B**	0.20	0.090	ug/L		04/11/24 12:21	04/11/24 16:47	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.13**	**J B**	0.20	0.090	ug/L		04/11/24 10:46	04/11/24 17:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	ND		0.10	0.029	mg/L			04/09/24 17:59	1
Alkalinity (SM 2320B)	**110**	**B**	20	5.0	mg/L			04/08/24 14:00	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**110**	**B**	20	5.0	mg/L			04/08/24 14:00	1
Total Dissolved Solids (SM 2540C)	**140**		25	13	mg/L			04/01/24 15:21	1
Total Organic Carbon - Duplicates (SM 5310B)	**2.8**		1.0	0.35	mg/L			04/02/24 07:18	1

Client Sample ID: MW-15A-032524

Lab Sample ID: 590-23966-2

Date Collected: 03/25/24 11:40

Matrix: Water

Date Received: 03/28/24 08:37

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**53**		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluoropentanoic acid (PFPeA)	**28**		3.6	0.91	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluorohexanoic acid (PFHxA)	**8.7**		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluoroheptanoic acid (PFHpA)	**5.2**		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluorooctanoic acid (PFOA)	**5.8**		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluorononanoic acid (PFNA)	**1.6**	**J**	1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluorotetradecanoic acid (PFTeDA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluorobutanesulfonic acid (PFBS)	**4.0**		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluoropentanesulfonic acid (PFPeS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluorohexanesulfonic acid (PFHxS)	**2.1**		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluorooctanesulfonic acid (PFOS)	**9.9**		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluorononanesulfonic acid (PFNS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluorododecanesulfonic acid (PFDoS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 10:47	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 10:47	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 10:47	1

Client Sample ID: MW-15A-032524
Lab Sample ID: 590-23966-2
Date Collected: 03/25/24 11:40
Matrix: Water
Date Received: 03/28/24 08:37

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonamide (PFOSA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 10:47	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		18	4.6	ng/L		04/04/24 04:12	04/05/24 10:47	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		18	4.6	ng/L		04/04/24 04:12	04/05/24 10:47	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 10:47	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		3.6	0.91	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		3.6	0.91	ng/L		04/04/24 04:12	04/05/24 10:47	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		3.6	0.91	ng/L		04/04/24 04:12	04/05/24 10:47	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 10:47	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 10:47	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		3.6	0.91	ng/L		04/04/24 04:12	04/05/24 10:47	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		9.1	2.3	ng/L		04/04/24 04:12	04/05/24 10:47	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		46	11	ng/L		04/04/24 04:12	04/05/24 10:47	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		46	11	ng/L		04/04/24 04:12	04/05/24 10:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*69.1*		*5 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C5 PFPeA	*78.0*		*40 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C5 PFHxA	*84.4*		*40 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C4 PFHpA	*77.2*		*40 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C8 PFOA	*73.7*		*40 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C9 PFNA	*73.7*		*40 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C6 PFDA	*70.2*		*40 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C7 PFUnA	*60.6*		*30 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C2 PFDoA	*59.2*		*10 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C2 PFTeDA	*53.3*		*10 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C3 PFBS	*70.9*		*40 - 135*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C3 PFHxS	*69.7*		*40 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C8 PFOS	*76.6*		*40 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C8 PFOSA	*66.6*		*40 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
d3-NMeFOSAA	*80.4*		*40 - 170*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
d5-NEtFOSAA	*85.3*		*25 - 135*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C2 4:2 FTS	*88.6*		*40 - 200*	*04/04/24 04:12*	*04/05/24 10:47*	*1*

Client Sample ID: MW-15A-032524
Lab Sample ID: 590-23966-2
Date Collected: 03/25/24 11:40
Matrix: Water
Date Received: 03/28/24 08:37

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 6:2 FTS	*77.5*		*40 - 200*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C2 8:2 FTS	*79.7*		*40 - 300*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
13C3 HFPO-DA	*83.8*		*40 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
d7-N-MeFOSE-M	*63.2*		*10 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
d9-N-EtFOSE-M	*67.4*		*10 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
d5-NEtPFOSA	*73.1*		*10 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*
d3-NMePFOSA	*68.2*		*10 - 130*	*04/04/24 04:12*	*04/05/24 10:47*	*1*

Client Sample ID: MW-2A-032524
Lab Sample ID: 590-23966-3
Date Collected: 03/26/24 11:25
Matrix: Water
Date Received: 03/28/24 08:37

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.17	ug/L			04/05/24 15:59	1
Tetrachloroethene	ND		1.0	0.22	ug/L			04/05/24 15:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*80 - 120*		*04/05/24 15:59*	*1*
4-Bromofluorobenzene (Surr)	*108*		*76 - 120*		*04/05/24 15:59*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 123*		*04/05/24 15:59*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*04/05/24 15:59*	*1*

Method: SW846 8270C SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.034	ug/L		04/01/24 09:03	04/01/24 17:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*41*		*40 - 140*	*04/01/24 09:03*	*04/01/24 17:33*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**62**		0.80	0.42	mg/L			03/28/24 12:53	1
Nitrate as N	**2.4**	**H**	0.20	0.057	mg/L			03/28/24 12:53	1
Nitrite as N	ND	H	0.20	0.069	mg/L			03/28/24 12:53	1
Sulfate	**21**		0.50	0.13	mg/L			03/28/24 12:53	1

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluoropentanoic acid (PFPeA)	ND		3.6	0.90	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorohexanoic acid (PFHxA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluoroheptanoic acid (PFHpA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorooctanoic acid (PFOA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorotetradecanoic acid (PFTeDA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorobutanesulfonic acid (PFBS)	**0.98**	**J**	1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1

Client Sample ID: MW-2A-032524
Date Collected: 03/26/24 11:25
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-3
Matrix: Water

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoropentanesulfonic acid (PFPeS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorohexanesulfonic acid (PFHxS)	**0.58**	**J**	1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorooctanesulfonic acid (PFOS)	**2.7**		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorononanesulfonic acid (PFNS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorododecanesulfonic acid (PFDoS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 13:08	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:08	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		18	4.5	ng/L		04/04/24 04:12	04/05/24 13:08	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		18	4.5	ng/L		04/04/24 04:12	04/05/24 13:08	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 13:08	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		3.6	0.90	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		3.6	0.90	ng/L		04/04/24 04:12	04/05/24 13:08	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		3.6	0.90	ng/L		04/04/24 04:12	04/05/24 13:08	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 13:08	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 13:08	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		3.6	0.90	ng/L		04/04/24 04:12	04/05/24 13:08	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		9.0	2.3	ng/L		04/04/24 04:12	04/05/24 13:08	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		45	11	ng/L		04/04/24 04:12	04/05/24 13:08	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		45	11	ng/L		04/04/24 04:12	04/05/24 13:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*69.4*		*5 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C5 PFPeA	*84.3*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C5 PFHxA	*82.8*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*

Client Sample ID: MW-2A-032524
Date Collected: 03/26/24 11:25
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-3
Matrix: Water

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*76.2*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C8 PFOA	*77.2*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C9 PFNA	*70.6*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C6 PFDA	*60.4*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C7 PFUnA	*59.2*		*30 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C2 PFDoA	*51.2*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C2 PFTeDA	*50.7*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C3 PFBS	*71.8*		*40 - 135*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C3 PFHxS	*67.5*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C8 PFOS	*75.5*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C8 PFOSA	*69.8*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
d3-NMeFOSAA	*77.4*		*40 - 170*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
d5-NEtFOSAA	*77.3*		*25 - 135*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C2 4:2 FTS	*85.6*		*40 - 200*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C2 8:2 FTS	*98.3*		*40 - 300*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
13C3 HFPO-DA	*85.2*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
d7-N-MeFOSE-M	*63.7*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
d9-N-EtFOSE-M	*67.8*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
d5-NEtPFOSA	*70.5*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*
d3-NMePFOSA	*65.0*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:08*	*1*

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/08/24 18:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 6:2 FTS	*76.9*		*40 - 200*	*04/04/24 04:12*	*04/08/24 18:43*	*1*

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Magnesium	**16**		1.0	0.13	mg/L		04/11/24 12:24	04/11/24 13:47	1
Potassium	**6.8**		0.50	0.29	mg/L		04/11/24 12:24	04/11/24 13:47	1
Sodium	**37**		0.50	0.20	mg/L		04/11/24 12:24	04/11/24 13:47	1

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	**32**		2.0	0.20	mg/L		04/11/24 10:49	04/11/24 14:49	1
Magnesium	**13**		1.0	0.13	mg/L		04/11/24 10:49	04/11/24 14:49	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0018**	**J**	0.0050	0.0010	mg/L		04/05/24 16:45	04/08/24 23:56	5
Cadmium	ND		0.0020	0.00019	mg/L		04/05/24 16:45	04/08/24 23:56	5
Iron	ND		0.50	0.067	mg/L		04/05/24 16:45	04/08/24 23:56	5
Lead	ND		0.0020	0.00020	mg/L		04/05/24 16:45	04/08/24 23:56	5
Manganese	ND		0.010	0.0023	mg/L		04/05/24 16:45	04/08/24 23:56	5
Zinc	ND		0.035	0.0046	mg/L		04/05/24 16:45	04/08/24 23:56	5

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0019**	**J**	0.0050	0.0010	mg/L		04/01/24 17:48	04/04/24 16:49	5

Client Sample ID: MW-2A-032524

Lab Sample ID: 590-23966-3

Date Collected: 03/26/24 11:25

Matrix: Water

Date Received: 03/28/24 08:37

Method: SW846 6020B - Metals (ICP/MS) - Dissolved (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0020	0.00019	mg/L		04/01/24 17:48	04/04/24 16:49	5
Iron	ND		0.50	0.067	mg/L		04/01/24 17:48	04/04/24 16:49	5
Lead	ND		0.0020	0.00020	mg/L		04/01/24 17:48	04/04/24 16:49	5
Manganese	**0.013**		0.010	0.0023	mg/L		04/01/24 17:48	04/04/24 16:49	5
Zinc	ND		0.035	0.0046	mg/L		04/01/24 17:48	04/04/24 16:49	5

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.12**	**J B**	0.20	0.090	ug/L		04/11/24 12:21	04/11/24 16:57	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.12**	**J B**	0.20	0.090	ug/L		04/11/24 10:46	04/11/24 17:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	ND		0.10	0.029	mg/L			04/09/24 18:12	1
Alkalinity (SM 2320B)	**200**	**B**	20	5.0	mg/L			04/08/24 14:00	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**200**	**B**	20	5.0	mg/L			04/08/24 14:00	1
Total Dissolved Solids (SM 2540C)	**340**		25	13	mg/L			04/01/24 15:21	1
Total Organic Carbon - Duplicates (SM 5310B)	**3.1**		1.0	0.35	mg/L			04/02/24 07:34	1

Client Sample ID: MW-8A-032524

Lab Sample ID: 590-23966-4

Date Collected: 03/26/24 12:35

Matrix: Water

Date Received: 03/28/24 08:37

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**14**		7.4	1.8	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluoropentanoic acid (PFPeA)	**22**		3.7	0.92	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluorohexanoic acid (PFHxA)	**7.4**		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluoroheptanoic acid (PFHpA)	**2.8**		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluorooctanoic acid (PFOA)	**4.4**		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluorotetradecanoic acid (PFTeDA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluorobutanesulfonic acid (PFBS)	**1.7**	**J**	1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluoropentanesulfonic acid (PFPeS)	**0.61**	**J**	1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluorohexanesulfonic acid (PFHxS)	**2.4**		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluorooctanesulfonic acid (PFOS)	**3.0**		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluorononanesulfonic acid (PFNS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1

Client: GeoEngineers Inc
Project/Site: Marshall Landfill/0504-104-01

Job ID: 590-23966-1

Client Sample ID: MW-8A-032524
Date Collected: 03/26/24 12:35
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-4
Matrix: Water

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluorododecanesulfonic acid (PFDoS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		7.4	1.8	ng/L		04/04/24 04:12	04/05/24 13:25	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		7.4	1.8	ng/L		04/04/24 04:12	04/05/24 13:25	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		7.4	1.8	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 13:25	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		18	4.6	ng/L		04/04/24 04:12	04/05/24 13:25	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		18	4.6	ng/L		04/04/24 04:12	04/05/24 13:25	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		7.4	1.8	ng/L		04/04/24 04:12	04/05/24 13:25	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		7.4	1.8	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		3.7	0.92	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		3.7	0.92	ng/L		04/04/24 04:12	04/05/24 13:25	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		3.7	0.92	ng/L		04/04/24 04:12	04/05/24 13:25	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		7.4	1.8	ng/L		04/04/24 04:12	04/05/24 13:25	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		7.4	1.8	ng/L		04/04/24 04:12	04/05/24 13:25	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		3.7	0.92	ng/L		04/04/24 04:12	04/05/24 13:25	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		9.2	2.3	ng/L		04/04/24 04:12	04/05/24 13:25	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		46	11	ng/L		04/04/24 04:12	04/05/24 13:25	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		46	11	ng/L		04/04/24 04:12	04/05/24 13:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*66.9*		*5 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C5 PFPeA	*77.8*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C5 PFHxA	*83.3*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C4 PFHpA	*74.1*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C8 PFOA	*74.0*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C9 PFNA	*73.5*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C6 PFDA	*62.6*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C7 PFUnA	*56.4*		*30 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C2 PFDoA	*51.3*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*

Client Sample ID: MW-8A-032524

Lab Sample ID: 590-23966-4

Date Collected: 03/26/24 12:35
Matrix: Water
Date Received: 03/28/24 08:37

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFTeDA	*51.3*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C3 PFBS	*70.0*		*40 - 135*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C3 PFHxS	*63.4*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C8 PFOS	*72.5*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C8 PFOSA	*66.7*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
d3-NMeFOSAA	*71.1*		*40 - 170*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
d5-NEtFOSAA	*72.3*		*25 - 135*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C2 4:2 FTS	*81.3*		*40 - 200*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C2 6:2 FTS	*72.0*		*40 - 200*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C2 8:2 FTS	*78.2*		*40 - 300*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
13C3 HFPO-DA	*82.3*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
d7-N-MeFOSE-M	*61.0*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
d9-N-EtFOSE-M	*62.7*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
d5-NEtPFOSA	*66.2*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*
d3-NMePFOSA	*61.6*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:25*	*1*

Client Sample ID: MW-9A-032524

Lab Sample ID: 590-23966-5

Date Collected: 03/26/24 13:40
Matrix: Water
Date Received: 03/28/24 08:37

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		7.1	1.8	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluoropentanoic acid (PFPeA)	ND		3.6	0.89	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorohexanoic acid (PFHxA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluoroheptanoic acid (PFHpA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorooctanoic acid (PFOA)	**0.70**	**J**	1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorotetradecanoic acid (PFTeDA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorobutanesulfonic acid (PFBS)	**3.3**		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluoropentanesulfonic acid (PFPeS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorohexanesulfonic acid (PFHxS)	**1.3**	**J**	1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorooctanesulfonic acid (PFOS)	**1.9**	**I**	1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorononanesulfonic acid (PFNS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorododecanesulfonic acid (PFDoS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		7.1	1.8	ng/L		04/04/24 04:12	04/05/24 13:43	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		7.1	1.8	ng/L		04/04/24 04:12	04/05/24 13:43	1

Client Sample ID: MW-9A-032524
Date Collected: 03/26/24 13:40
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-5
Matrix: Water

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		7.1	1.8	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 13:43	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		18	4.5	ng/L		04/04/24 04:12	04/05/24 13:43	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		18	4.5	ng/L		04/04/24 04:12	04/05/24 13:43	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		7.1	1.8	ng/L		04/04/24 04:12	04/05/24 13:43	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		7.1	1.8	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		3.6	0.89	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		3.6	0.89	ng/L		04/04/24 04:12	04/05/24 13:43	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		3.6	0.89	ng/L		04/04/24 04:12	04/05/24 13:43	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		7.1	1.8	ng/L		04/04/24 04:12	04/05/24 13:43	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		7.1	1.8	ng/L		04/04/24 04:12	04/05/24 13:43	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		3.6	0.89	ng/L		04/04/24 04:12	04/05/24 13:43	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		8.9	2.2	ng/L		04/04/24 04:12	04/05/24 13:43	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		45	11	ng/L		04/04/24 04:12	04/05/24 13:43	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		45	11	ng/L		04/04/24 04:12	04/05/24 13:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*69.5*		*5 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C5 PFPeA	*81.8*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C5 PFHxA	*84.2*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C4 PFHpA	*81.3*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C8 PFOA	*76.9*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C9 PFNA	*78.2*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C6 PFDA	*64.5*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C7 PFUnA	*63.9*		*30 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C2 PFDoA	*54.2*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C2 PFTeDA	*51.6*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C3 PFBS	*74.5*		*40 - 135*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C3 PFHxS	*68.9*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C8 PFOS	*77.6*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C8 PFOSA	*69.6*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
d3-NMeFOSAA	*74.8*		*40 - 170*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
d5-NEtFOSAA	*77.9*		*25 - 135*	*04/04/24 04:12*	*04/05/24 13:43*	*1*

Client Sample ID: MW-9A-032524
Lab Sample ID: 590-23966-5

Date Collected: 03/26/24 13:40
Matrix: Water
Date Received: 03/28/24 08:37

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 4:2 FTS	*91.1*		*40 - 200*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C2 6:2 FTS	*79.3*		*40 - 200*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C2 8:2 FTS	*94.7*		*40 - 300*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
13C3 HFPO-DA	*83.4*		*40 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
d7-N-MeFOSE-M	*67.9*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
d9-N-EtFOSE-M	*69.3*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
d5-NEtPFOSA	*71.0*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*
d3-NMePFOSA	*65.1*		*10 - 130*	*04/04/24 04:12*	*04/05/24 13:43*	*1*

Client Sample ID: MW-16A-032524
Lab Sample ID: 590-23966-6

Date Collected: 03/26/24 14:36
Matrix: Water
Date Received: 03/28/24 08:37

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**2.6**	**J**	7.3	1.8	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluoropentanoic acid (PFPeA)	**2.1**	**J**	3.7	0.92	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorohexanoic acid (PFHxA)	**1.0**	**J**	1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluoroheptanoic acid (PFHpA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorooctanoic acid (PFOA)	**1.5**	**J**	1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorotetradecanoic acid (PFTeDA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluoropentanesulfonic acid (PFPeS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorooctanesulfonic acid (PFOS)	**2.6**		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorononanesulfonic acid (PFNS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorododecanesulfonic acid (PFDoS)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 14:01	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 14:01	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.8	0.46	ng/L		04/04/24 04:12	04/05/24 14:01	1

Client: GeoEngineers Inc
Project/Site: Marshall Landfill/0504-104-01

Job ID: 590-23966-1

Client Sample ID: MW-16A-032524
Date Collected: 03/26/24 14:36
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-6
Matrix: Water

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		18	4.6	ng/L		04/04/24 04:12	04/05/24 14:01	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		18	4.6	ng/L		04/04/24 04:12	04/05/24 14:01	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 14:01	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		3.7	0.92	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		3.7	0.92	ng/L		04/04/24 04:12	04/05/24 14:01	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		3.7	0.92	ng/L		04/04/24 04:12	04/05/24 14:01	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 14:01	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		7.3	1.8	ng/L		04/04/24 04:12	04/05/24 14:01	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		3.7	0.92	ng/L		04/04/24 04:12	04/05/24 14:01	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		9.2	2.3	ng/L		04/04/24 04:12	04/05/24 14:01	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		46	11	ng/L		04/04/24 04:12	04/05/24 14:01	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		46	11	ng/L		04/04/24 04:12	04/05/24 14:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*66.5*		*5 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C5 PFPeA	*79.9*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C5 PFHxA	*80.7*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C4 PFHpA	*71.5*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C8 PFOA	*71.4*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C9 PFNA	*72.2*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C6 PFDA	*64.3*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C7 PFUnA	*54.9*		*30 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C2 PFDoA	*50.0*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C2 PFTeDA	*49.2*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C3 PFBS	*71.5*		*40 - 135*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C3 PFHxS	*64.6*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C8 PFOS	*74.8*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C8 PFOSA	*66.5*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
d3-NMeFOSAA	*66.7*		*40 - 170*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
d5-NEtFOSAA	*73.9*		*25 - 135*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C2 4:2 FTS	*86.1*		*40 - 200*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C2 6:2 FTS	*72.1*		*40 - 200*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C2 8:2 FTS	*88.6*		*40 - 300*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
13C3 HFPO-DA	*80.1*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
d7-N-MeFOSE-M	*61.7*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
d9-N-EtFOSE-M	*62.5*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
d5-NEtPFOSA	*66.0*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*
d3-NMePFOSA	*62.8*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:01*	*1*

Client Sample ID: MW-7B-032524

Date Collected: 03/27/24 09:25
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-7

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.17	ug/L			04/05/24 16:20	1
Tetrachloroethene	ND		1.0	0.22	ug/L			04/05/24 16:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*80 - 120*		*04/05/24 16:20*	*1*
4-Bromofluorobenzene (Surr)	*110*		*76 - 120*		*04/05/24 16:20*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 123*		*04/05/24 16:20*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*04/05/24 16:20*	*1*

Method: SW846 8270C SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.060**	**J B**	0.18	0.033	ug/L		04/01/24 09:03	04/01/24 17:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*35*	**5-*	*40 - 140*	*04/01/24 09:03*	*04/01/24 17:47*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**0.70**	**J**	0.80	0.42	mg/L			03/28/24 13:03	1
Nitrate as N	ND		0.20	0.057	mg/L			03/28/24 13:03	1
Nitrite as N	ND		0.20	0.069	mg/L			03/28/24 13:03	1
Sulfate	**3.9**		0.50	0.13	mg/L			03/28/24 13:03	1

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**4.3**	**J**	8.4	2.1	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluoropentanoic acid (PFPeA)	**3.6**	**J**	4.2	1.0	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluorohexanoic acid (PFHxA)	**1.4**	**J**	2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluoroheptanoic acid (PFHpA)	**0.77**	**J**	2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluorooctanoic acid (PFOA)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluorononanoic acid (PFNA)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluorodecanoic acid (PFDA)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluoroundecanoic acid (PFUnA)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluorododecanoic acid (PFDoA)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluorotridecanoic acid (PFTrDA)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluorotetradecanoic acid (PFTeDA)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluoropentanesulfonic acid (PFPeS)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluorononanesulfonic acid (PFNS)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluorododecanesulfonic acid (PFDoS)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		8.4	2.1	ng/L		04/04/24 04:12	04/05/24 14:18	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		8.4	2.1	ng/L		04/04/24 04:12	04/05/24 14:18	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		8.4	2.1	ng/L		04/04/24 04:12	04/05/24 14:18	1

Client Sample ID: MW-7B-032524
Date Collected: 03/27/24 09:25
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-7
Matrix: Water

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonamide (PFOSA)	**1.5**	**J**	2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.52	ng/L		04/04/24 04:12	04/05/24 14:18	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		21	5.2	ng/L		04/04/24 04:12	04/05/24 14:18	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		21	5.2	ng/L		04/04/24 04:12	04/05/24 14:18	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		8.4	2.1	ng/L		04/04/24 04:12	04/05/24 14:18	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		8.4	2.1	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		4.2	1.0	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		4.2	1.0	ng/L		04/04/24 04:12	04/05/24 14:18	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		4.2	1.0	ng/L		04/04/24 04:12	04/05/24 14:18	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		8.4	2.1	ng/L		04/04/24 04:12	04/05/24 14:18	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		8.4	2.1	ng/L		04/04/24 04:12	04/05/24 14:18	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		4.2	1.0	ng/L		04/04/24 04:12	04/05/24 14:18	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		10	2.6	ng/L		04/04/24 04:12	04/05/24 14:18	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		52	13	ng/L		04/04/24 04:12	04/05/24 14:18	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		52	13	ng/L		04/04/24 04:12	04/05/24 14:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*65.5*		*5 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C5 PFPeA	*76.6*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C5 PFHxA	*80.6*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C4 PFHpA	*73.0*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C8 PFOA	*69.5*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C9 PFNA	*73.2*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C6 PFDA	*51.0*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C7 PFUnA	*50.3*		*30 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C2 PFDoA	*46.4*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C2 PFTeDA	*48.7*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C3 PFBS	*69.4*		*40 - 135*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C3 PFHxS	*65.9*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C8 PFOS	*72.4*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C8 PFOSA	*64.5*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
d3-NMeFOSAA	*70.9*		*40 - 170*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
d5-NEtFOSAA	*71.3*		*25 - 135*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C2 4:2 FTS	*85.0*		*40 - 200*	*04/04/24 04:12*	*04/05/24 14:18*	*1*

Client Sample ID: MW-7B-032524

Date Collected: 03/27/24 09:25
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-7

Matrix: Water

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 6:2 FTS	*71.0*		*40 - 200*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C2 8:2 FTS	*86.6*		*40 - 300*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
13C3 HFPO-DA	*79.0*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
d7-N-MeFOSE-M	*48.8*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
d9-N-EtFOSE-M	*56.6*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
d5-NEtPFOSA	*67.3*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*
d3-NMePFOSA	*59.2*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:18*	*1*

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Magnesium	**11**		1.0	0.13	mg/L		04/11/24 12:24	04/11/24 14:11	1
Potassium	**1.6**		0.50	0.29	mg/L		04/11/24 12:24	04/11/24 14:11	1
Sodium	**4.0**		0.50	0.20	mg/L		04/11/24 12:24	04/11/24 14:11	1

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	**34**		2.0	0.20	mg/L		04/11/24 10:49	04/11/24 17:44	1
Magnesium	**10**		1.0	0.13	mg/L		04/11/24 10:49	04/11/24 15:26	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0010	mg/L		04/05/24 16:45	04/08/24 23:59	5
Cadmium	ND		0.0020	0.00019	mg/L		04/05/24 16:45	04/08/24 23:59	5
Iron	**0.13**	**J**	0.50	0.067	mg/L		04/05/24 16:45	04/08/24 23:59	5
Lead	**0.00088**	**J**	0.0020	0.00020	mg/L		04/05/24 16:45	04/08/24 23:59	5
Manganese	**0.0050**	**J**	0.010	0.0023	mg/L		04/05/24 16:45	04/08/24 23:59	5
Zinc	**0.0055**	**J**	0.035	0.0046	mg/L		04/05/24 16:45	04/08/24 23:59	5

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0010	mg/L		04/01/24 17:48	04/04/24 16:52	5
Cadmium	ND		0.0020	0.00019	mg/L		04/01/24 17:48	04/04/24 16:52	5
Iron	ND		0.50	0.067	mg/L		04/01/24 17:48	04/04/24 16:52	5
Lead	ND		0.0020	0.00020	mg/L		04/01/24 17:48	04/04/24 16:52	5
Manganese	**0.0078**	**J**	0.010	0.0023	mg/L		04/01/24 17:48	04/04/24 16:52	5
Zinc	**0.0046**	**J**	0.035	0.0046	mg/L		04/01/24 17:48	04/04/24 16:52	5

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.12**	**J B**	0.20	0.090	ug/L		04/11/24 12:21	04/11/24 16:59	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.13**	**J B**	0.20	0.090	ug/L		04/11/24 10:46	04/11/24 17:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	ND		0.10	0.029	mg/L			04/09/24 18:14	1
Alkalinity (SM 2320B)	**160**	**B**	20	5.0	mg/L			04/08/24 14:00	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**160**	**B**	20	5.0	mg/L			04/08/24 14:00	1

Client Sample ID: MW-7B-032524

Lab Sample ID: 590-23966-7
Matrix: Water
Date Collected: 03/27/24 09:25
Date Received: 03/28/24 08:37

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	230		25	13	mg/L			04/03/24 15:26	1
Total Organic Carbon - Duplicates (SM 5310B)	0.78	J	1.0	0.35	mg/L			04/02/24 07:50	1

Client Sample ID: MW-5A-032524

Lab Sample ID: 590-23966-8
Matrix: Water
Date Collected: 03/27/24 10:45
Date Received: 03/28/24 08:37

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.17	ug/L			04/05/24 16:41	1
Tetrachloroethene	ND		1.0	0.22	ug/L			04/05/24 16:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*80 - 120*		*04/05/24 16:41*	*1*
4-Bromofluorobenzene (Surr)	*108*		*76 - 120*		*04/05/24 16:41*	*1*
Dibromofluoromethane (Surr)	*106*		*80 - 123*		*04/05/24 16:41*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*04/05/24 16:41*	*1*

Method: SW846 8270C SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.034	ug/L		04/01/24 09:03	04/01/24 18:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*36*	*5-*	*40 - 140*	*04/01/24 09:03*	*04/01/24 18:01*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	54		0.80	0.42	mg/L			03/28/24 13:13	1
Nitrate as N	1.4		0.20	0.057	mg/L			03/28/24 13:13	1
Nitrite as N	ND		0.20	0.069	mg/L			03/28/24 13:13	1
Sulfate	14		0.50	0.13	mg/L			03/28/24 13:13	1

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	19		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluoropentanoic acid (PFPeA)	13		3.6	0.89	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorohexanoic acid (PFHxA)	24		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluoroheptanoic acid (PFHpA)	21		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorooctanoic acid (PFOA)	39		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorononanoic acid (PFNA)	1.0	J	1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorotetradecanoic acid (PFTeDA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorobutanesulfonic acid (PFBS)	7.8		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluoropentanesulfonic acid (PFPeS)	2.5		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorohexanesulfonic acid (PFHxS)	9.3		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1

Client Sample ID: MW-5A-032524
Date Collected: 03/27/24 10:45
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-8
Matrix: Water

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanesulfonic acid (PFHpS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorooctanesulfonic acid (PFOS)	**15**		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorononanesulfonic acid (PFNS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorododecanesulfonic acid (PFDoS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 14:36	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 14:36	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 14:36	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		18	4.5	ng/L		04/04/24 04:12	04/05/24 14:36	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		18	4.5	ng/L		04/04/24 04:12	04/05/24 14:36	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 14:36	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		3.6	0.89	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		3.6	0.89	ng/L		04/04/24 04:12	04/05/24 14:36	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		3.6	0.89	ng/L		04/04/24 04:12	04/05/24 14:36	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 14:36	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 14:36	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		3.6	0.89	ng/L		04/04/24 04:12	04/05/24 14:36	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		8.9	2.2	ng/L		04/04/24 04:12	04/05/24 14:36	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		45	11	ng/L		04/04/24 04:12	04/05/24 14:36	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		45	11	ng/L		04/04/24 04:12	04/05/24 14:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*67.9*		*5 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C5 PFPeA	*80.1*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C5 PFHxA	*82.2*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C4 PFHpA	*74.0*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C8 PFOA	*73.8*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*

Client Sample ID: MW-5A-032524
Date Collected: 03/27/24 10:45
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-8
Matrix: Water

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C9 PFNA	*69.1*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C6 PFDA	*55.3*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C7 PFUnA	*55.3*		*30 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C2 PFDoA	*47.3*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C2 PFTeDA	*47.6*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C3 PFBS	*73.2*		*40 - 135*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C3 PFHxS	*67.6*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C8 PFOS	*74.2*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C8 PFOSA	*68.6*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
d3-NMeFOSAA	*69.4*		*40 - 170*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
d5-NEtFOSAA	*71.9*		*25 - 135*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C2 4:2 FTS	*86.9*		*40 - 200*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C2 6:2 FTS	*75.3*		*40 - 200*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C2 8:2 FTS	*92.7*		*40 - 300*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
13C3 HFPO-DA	*84.3*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
d7-N-MeFOSE-M	*68.8*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
d9-N-EtFOSE-M	*70.8*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
d5-NEtPFOSA	*71.6*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*
d3-NMePFOSA	*67.0*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:36*	*1*

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Magnesium	**11**		1.0	0.13	mg/L		04/11/24 12:24	04/11/24 14:28	1
Potassium	**3.8**		0.50	0.29	mg/L		04/11/24 12:24	04/11/24 14:28	1
Sodium	**27**		0.50	0.20	mg/L		04/11/24 12:24	04/11/24 14:28	1

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	**71**		2.0	0.20	mg/L		04/11/24 10:49	04/11/24 17:48	1
Magnesium	**10**		1.0	0.13	mg/L		04/11/24 10:49	04/11/24 15:30	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0012**	**J**	0.0050	0.0010	mg/L		04/05/24 16:45	04/09/24 00:02	5
Cadmium	ND		0.0020	0.00019	mg/L		04/05/24 16:45	04/09/24 00:02	5
Iron	ND		0.50	0.067	mg/L		04/05/24 16:45	04/09/24 00:02	5
Lead	ND		0.0020	0.00020	mg/L		04/05/24 16:45	04/09/24 00:02	5
Manganese	ND		0.010	0.0023	mg/L		04/05/24 16:45	04/09/24 00:02	5
Zinc	ND		0.035	0.0046	mg/L		04/05/24 16:45	04/09/24 00:02	5

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0012**	**J**	0.0050	0.0010	mg/L		04/01/24 17:48	04/04/24 16:38	5
Cadmium	ND		0.0020	0.00019	mg/L		04/01/24 17:48	04/04/24 16:38	5
Iron	ND		0.50	0.067	mg/L		04/01/24 17:48	04/04/24 16:38	5
Lead	ND		0.0020	0.00020	mg/L		04/01/24 17:48	04/04/24 16:38	5
Manganese	ND		0.010	0.0023	mg/L		04/01/24 17:48	04/04/24 16:38	5
Zinc	**0.0060**	**J**	0.035	0.0046	mg/L		04/01/24 17:48	04/04/24 16:38	5

Client Sample ID: MW-5A-032524
Lab Sample ID: 590-23966-8
Date Collected: 03/27/24 10:45
Matrix: Water
Date Received: 03/28/24 08:37

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.13**	**J B**	0.20	0.090	ug/L		04/11/24 12:21	04/11/24 17:02	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.13**	**J B**	0.20	0.090	ug/L		04/11/24 10:46	04/11/24 17:32	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	ND		0.10	0.029	mg/L			04/09/24 18:23	1
Alkalinity (SM 2320B)	**340**	**B**	20	5.0	mg/L			04/08/24 14:00	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**340**	**B**	20	5.0	mg/L			04/08/24 14:00	1
Total Dissolved Solids (SM 2540C)	**540**		25	13	mg/L			04/03/24 15:26	1
Total Organic Carbon - Duplicates (SM 5310B)	**2.5**		1.0	0.35	mg/L			04/02/24 08:05	1

Client Sample ID: DUP-032724
Lab Sample ID: 590-23966-9
Date Collected: 03/27/24 12:00
Matrix: Water
Date Received: 03/28/24 08:37

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.17	ug/L			04/05/24 17:01	1
Tetrachloroethene	ND		1.0	0.22	ug/L			04/05/24 17:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*80 - 120*		*04/05/24 17:01*	*1*
4-Bromofluorobenzene (Surr)	*108*		*76 - 120*		*04/05/24 17:01*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 123*		*04/05/24 17:01*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*04/05/24 17:01*	*1*

Method: SW846 8270C SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.21	0.037	ug/L		04/01/24 09:03	04/01/24 18:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*35*	**5-*	*40 - 140*	*04/01/24 09:03*	*04/01/24 18:15*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**57**		0.80	0.42	mg/L			03/28/24 13:23	1
Nitrate as N	**1.9**		0.20	0.057	mg/L			03/28/24 13:23	1
Nitrite as N	**0.43**		0.20	0.069	mg/L			03/28/24 13:23	1
Sulfate	**14**		0.50	0.13	mg/L			03/28/24 13:23	1

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**19**		7.4	1.9	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluoropentanoic acid (PFPeA)	**13**		3.7	0.93	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluorohexanoic acid (PFHxA)	**23**		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluoroheptanoic acid (PFHpA)	**19**		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluorooctanoic acid (PFOA)	**38**		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluorononanoic acid (PFNA)	**1.1**	**J**	1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1

Client Sample ID: DUP-032724
Date Collected: 03/27/24 12:00
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-9
Matrix: Water

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanoic acid (PFDA)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluorotetradecanoic acid (PFTeDA)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluorobutanesulfonic acid (PFBS)	**8.3**		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluoropentanesulfonic acid (PFPeS)	**2.3**		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluorohexanesulfonic acid (PFHxS)	**8.8**		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluorooctanesulfonic acid (PFOS)	**15**		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluorononanesulfonic acid (PFNS)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluorododecanesulfonic acid (PFDoS)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		7.4	1.9	ng/L		04/04/24 04:12	04/05/24 14:54	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		7.4	1.9	ng/L		04/04/24 04:12	04/05/24 14:54	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		7.4	1.9	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.9	0.46	ng/L		04/04/24 04:12	04/05/24 14:54	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		19	4.6	ng/L		04/04/24 04:12	04/05/24 14:54	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		19	4.6	ng/L		04/04/24 04:12	04/05/24 14:54	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		7.4	1.9	ng/L		04/04/24 04:12	04/05/24 14:54	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		7.4	1.9	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		3.7	0.93	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		3.7	0.93	ng/L		04/04/24 04:12	04/05/24 14:54	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		3.7	0.93	ng/L		04/04/24 04:12	04/05/24 14:54	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		7.4	1.9	ng/L		04/04/24 04:12	04/05/24 14:54	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		7.4	1.9	ng/L		04/04/24 04:12	04/05/24 14:54	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		3.7	0.93	ng/L		04/04/24 04:12	04/05/24 14:54	1

Client Sample ID: DUP-032724

Date Collected: 03/27/24 12:00
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-9

Matrix: Water

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		9.3	2.3	ng/L		04/04/24 04:12	04/05/24 14:54	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		46	12	ng/L		04/04/24 04:12	04/05/24 14:54	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		46	12	ng/L		04/04/24 04:12	04/05/24 14:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*66.6*		*5 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C5 PFPeA	*78.1*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C5 PFHxA	*85.5*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C4 PFHpA	*77.8*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C8 PFOA	*71.2*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C9 PFNA	*77.0*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C6 PFDA	*68.1*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C7 PFUnA	*70.1*		*30 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C2 PFDoA	*58.5*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C2 PFTeDA	*59.7*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C3 PFBS	*68.9*		*40 - 135*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C3 PFHxS	*66.7*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C8 PFOS	*76.6*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C8 PFOSA	*69.0*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
d3-NMeFOSAA	*74.7*		*40 - 170*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
d5-NEtFOSAA	*75.2*		*25 - 135*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C2 4:2 FTS	*82.2*		*40 - 200*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C2 6:2 FTS	*72.3*		*40 - 200*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C2 8:2 FTS	*95.0*		*40 - 300*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
13C3 HFPO-DA	*83.4*		*40 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
d7-N-MeFOSE-M	*72.2*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
d9-N-EtFOSE-M	*73.9*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
d5-NEtPFOSA	*78.1*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*
d3-NMePFOSA	*70.5*		*10 - 130*	*04/04/24 04:12*	*04/05/24 14:54*	*1*

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Magnesium	**11**		1.0	0.13	mg/L		04/11/24 12:24	04/11/24 14:32	1
Potassium	**3.8**		0.50	0.29	mg/L		04/11/24 12:24	04/11/24 14:32	1
Sodium	**27**		0.50	0.20	mg/L		04/11/24 12:24	04/11/24 14:32	1

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	**72**		2.0	0.20	mg/L		04/11/24 10:49	04/11/24 17:52	1
Magnesium	**10**		1.0	0.13	mg/L		04/11/24 10:49	04/11/24 15:34	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0014**	**J**	0.0050	0.0010	mg/L		04/05/24 16:45	04/09/24 00:05	5
Cadmium	ND		0.0020	0.00019	mg/L		04/05/24 16:45	04/09/24 00:05	5
Iron	ND		0.50	0.067	mg/L		04/05/24 16:45	04/09/24 00:05	5
Lead	ND		0.0020	0.00020	mg/L		04/05/24 16:45	04/09/24 00:05	5
Manganese	ND		0.010	0.0023	mg/L		04/05/24 16:45	04/09/24 00:05	5
Zinc	ND		0.035	0.0046	mg/L		04/05/24 16:45	04/09/24 00:05	5

Client Sample ID: DUP-032724

Lab Sample ID: 590-23966-9

Date Collected: 03/27/24 12:00

Matrix: Water

Date Received: 03/28/24 08:37

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0013**	**J**	0.0050	0.0010	mg/L		04/01/24 17:48	04/04/24 16:41	5
Cadmium	ND		0.0020	0.00019	mg/L		04/01/24 17:48	04/04/24 16:41	5
Iron	ND		0.50	0.067	mg/L		04/01/24 17:48	04/04/24 16:41	5
Lead	ND		0.0020	0.00020	mg/L		04/01/24 17:48	04/04/24 16:41	5
Manganese	ND		0.010	0.0023	mg/L		04/01/24 17:48	04/04/24 16:41	5
Zinc	ND		0.035	0.0046	mg/L		04/01/24 17:48	04/04/24 16:41	5

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.13**	**J B**	0.20	0.090	ug/L		04/11/24 12:21	04/11/24 17:09	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.13**	**J B**	0.20	0.090	ug/L		04/11/24 10:46	04/11/24 17:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	ND		0.10	0.029	mg/L			04/09/24 18:25	1
Alkalinity (SM 2320B)	**330**	**B**	20	5.0	mg/L			04/08/24 14:00	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**330**	**B**	20	5.0	mg/L			04/08/24 14:00	1
Total Dissolved Solids (SM 2540C)	**520**		25	13	mg/L			04/03/24 15:26	1
Total Organic Carbon - Duplicates (SM 5310B)	**2.3**		1.0	0.35	mg/L			04/02/24 08:52	1

Client Sample ID: FB-032524

Lab Sample ID: 590-23966-10

Date Collected: 03/25/24 11:06

Matrix: Water

Date Received: 03/28/24 08:37

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluoropentanoic acid (PFPeA)	ND		3.6	0.90	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluorohexanoic acid (PFHxA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluoroheptanoic acid (PFHpA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluorooctanoic acid (PFOA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluorotetradecanoic acid (PFTeDA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluoropentanesulfonic acid (PFPeS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluorononanesulfonic acid (PFNS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1

Client Sample ID: FB-032524
Date Collected: 03/25/24 11:06
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-10
Matrix: Water

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanesulfonic acid (PFDoS)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 15:46	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 15:46	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.8	0.45	ng/L		04/04/24 04:12	04/05/24 15:46	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		18	4.5	ng/L		04/04/24 04:12	04/05/24 15:46	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		18	4.5	ng/L		04/04/24 04:12	04/05/24 15:46	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 15:46	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		3.6	0.90	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		3.6	0.90	ng/L		04/04/24 04:12	04/05/24 15:46	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		3.6	0.90	ng/L		04/04/24 04:12	04/05/24 15:46	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 15:46	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		7.2	1.8	ng/L		04/04/24 04:12	04/05/24 15:46	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		3.6	0.90	ng/L		04/04/24 04:12	04/05/24 15:46	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		9.0	2.3	ng/L		04/04/24 04:12	04/05/24 15:46	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		45	11	ng/L		04/04/24 04:12	04/05/24 15:46	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		45	11	ng/L		04/04/24 04:12	04/05/24 15:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*66.1*		*5 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C5 PFPeA	*73.4*		*40 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C5 PFHxA	*78.9*		*40 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C4 PFHpA	*73.7*		*40 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C8 PFOA	*68.7*		*40 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C9 PFNA	*68.0*		*40 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C6 PFDA	*61.8*		*40 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C7 PFUnA	*59.5*		*30 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C2 PFDoA	*49.8*		*10 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C2 PFTeDA	*50.3*		*10 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*

Client Sample ID: FB-032524
Lab Sample ID: 590-23966-10

Date Collected: 03/25/24 11:06
Matrix: Water
Date Received: 03/28/24 08:37

Method: EPA Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 PFBS	*67.8*		*40 - 135*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C3 PFHxS	*64.1*		*40 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C8 PFOS	*72.9*		*40 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C8 PFOSA	*62.0*		*40 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
d3-NMeFOSAA	*72.2*		*40 - 170*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
d5-NEtFOSAA	*68.8*		*25 - 135*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C2 4:2 FTS	*80.4*		*40 - 200*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C2 6:2 FTS	*74.1*		*40 - 200*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C2 8:2 FTS	*83.8*		*40 - 300*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
13C3 HFPO-DA	*82.8*		*40 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
d7-N-MeFOSE-M	*63.2*		*10 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
d9-N-EtFOSE-M	*64.3*		*10 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
d5-NEtPFOSA	*69.2*		*10 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*
d3-NMePFOSA	*59.5*		*10 - 130*	*04/04/24 04:12*	*04/05/24 15:46*	*1*

Client Sample ID: TB-2/26
Lab Sample ID: 590-23966-11

Date Collected: 03/26/24 00:00
Matrix: Water
Date Received: 03/28/24 08:37

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.17	ug/L			04/05/24 17:43	1
Tetrachloroethene	ND		1.0	0.22	ug/L			04/05/24 17:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*80 - 120*		*04/05/24 17:43*	*1*
4-Bromofluorobenzene (Surr)	*109*		*76 - 120*		*04/05/24 17:43*	*1*
Dibromofluoromethane (Surr)	*107*		*80 - 123*		*04/05/24 17:43*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*04/05/24 17:43*	*1*

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 590-46631/10
Matrix: Water
Analysis Batch: 46631

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.17	ug/L			04/05/24 13:52	1
Tetrachloroethene	ND		1.0	0.22	ug/L			04/05/24 13:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*80 - 120*		*04/05/24 13:52*	*1*
4-Bromofluorobenzene (Surr)	*111*		*76 - 120*		*04/05/24 13:52*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 123*		*04/05/24 13:52*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*04/05/24 13:52*	*1*

Lab Sample ID: LCS 590-46631/1005
Matrix: Water
Analysis Batch: 46631

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
1,1,1-Trichloroethane			10.0	10.5		ug/L		105	71 - 138		
Tetrachloroethene			10.0	8.39		ug/L		84	80 - 139		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*106*		*80 - 120*
4-Bromofluorobenzene (Surr)	*108*		*76 - 120*
Dibromofluoromethane (Surr)	*96*		*80 - 123*
Toluene-d8 (Surr)	*98*		*80 - 120*

Lab Sample ID: LCSD 590-46631/6
Matrix: Water
Analysis Batch: 46631

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,1,1-Trichloroethane			10.0	10.4		ug/L		104	71 - 138	1	17
Tetrachloroethene			10.0	8.34		ug/L		83	80 - 139	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*80 - 120*
4-Bromofluorobenzene (Surr)	*104*		*76 - 120*
Dibromofluoromethane (Surr)	*93*		*80 - 123*
Toluene-d8 (Surr)	*97*		*80 - 120*

Method: 8270C SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Lab Sample ID: MB 580-455296/1-A
Matrix: Water
Analysis Batch: 455319

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455296

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.0816	J	0.20	0.036	ug/L		04/01/24 09:03	04/01/24 15:56	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*45*		*40 - 140*	*04/01/24 09:03*	*04/01/24 15:56*	*1*

Method: 8270C SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Lab Sample ID: LCS 580-455296/2-A
Matrix: Water
Analysis Batch: 455319

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 455296

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
1,4-Dioxane			8.00	7.66		ug/L		96	78 - 130		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,4-Dioxane-d8	*49*		*40 - 140*

Lab Sample ID: LCSD 580-455296/3-A
Matrix: Water
Analysis Batch: 455319

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 455296

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,4-Dioxane			8.00	7.86		ug/L		98	78 - 130	3	13

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,4-Dioxane-d8	*45*		*40 - 140*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 590-46500/1003
Matrix: Water
Analysis Batch: 46500

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.20	0.057	mg/L			03/28/24 08:43	1
Nitrite as N	ND		0.20	0.069	mg/L			03/28/24 08:43	1

Lab Sample ID: LCS 590-46500/1004
Matrix: Water
Analysis Batch: 46500

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate as N			5.00	5.29		mg/L		106	90 - 110		
Nitrite as N			5.00	5.24		mg/L		105	90 - 110		

Lab Sample ID: MB 590-46501/1003
Matrix: Water
Analysis Batch: 46501

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.80	0.42	mg/L			03/28/24 08:43	1
Sulfate	ND		0.50	0.13	mg/L			03/28/24 08:43	1

Lab Sample ID: LCS 590-46501/1004
Matrix: Water
Analysis Batch: 46501

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			12.5	13.3		mg/L		107	90 - 110		
Sulfate			12.5	12.9		mg/L		103	90 - 110		

Method: Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Lab Sample ID: MB 320-752267/1-A
Matrix: Water
Analysis Batch: 752549

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 752267

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		8.0	2.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluoropentanoic acid (PFPeA)	ND		4.0	1.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorotridecanoic acid (PFTrDA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorotetradecanoic acid (PFTeDA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluoropentanesulfonic acid (PFPeS)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorononanesulfonic acid (PFNS)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorododecanesulfonic acid (PFDoS)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		8.0	2.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		8.0	2.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		8.0	2.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluorooctanesulfonamide (PFOSA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.50	ng/L		12/06/23 04:39	04/05/24 08:26	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		20	5.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		20	5.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		8.0	2.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		8.0	2.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		4.0	1.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		4.0	1.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		4.0	1.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	ND		8.0	2.0	ng/L		12/06/23 04:39	04/05/24 08:26	1

Method: Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: MB 320-752267/1-A
Matrix: Water
Analysis Batch: 752549

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 752267

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ND		8.0	2.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	ND		4.0	1.0	ng/L		12/06/23 04:39	04/05/24 08:26	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		10	2.5	ng/L		12/06/23 04:39	04/05/24 08:26	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		50	13	ng/L		12/06/23 04:39	04/05/24 08:26	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		50	13	ng/L		12/06/23 04:39	04/05/24 08:26	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*72.2*		*5 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C5 PFPeA	*84.0*		*40 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C5 PFHxA	*86.6*		*40 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C4 PFHpA	*80.5*		*40 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C8 PFOA	*79.9*		*40 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C9 PFNA	*73.4*		*40 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C6 PFDA	*66.5*		*40 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C7 PFUnA	*67.2*		*30 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C2 PFDoA	*60.5*		*10 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C2 PFTeDA	*57.4*		*10 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C3 PFBS	*74.2*		*40 - 135*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C3 PFHxS	*70.3*		*40 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C8 PFOS	*84.8*		*40 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C8 PFOSA	*70.3*		*40 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
d3-NMeFOSAA	*76.6*		*40 - 170*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
d5-NEtFOSAA	*80.9*		*25 - 135*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C2 4:2 FTS	*81.9*		*40 - 200*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C2 6:2 FTS	*73.1*		*40 - 200*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C2 8:2 FTS	*86.3*		*40 - 300*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
13C3 HFPO-DA	*87.2*		*40 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
d7-N-MeFOSE-M	*73.1*		*10 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
d9-N-EtFOSE-M	*77.2*		*10 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
d5-NEtPFOSA	*80.4*		*10 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*
d3-NMePFOSA	*70.5*		*10 - 130*	*12/06/23 04:39*	*04/05/24 08:26*	*1*

Lab Sample ID: LCS 320-752267/3-A
Matrix: Water
Analysis Batch: 752549

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 752267

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	128	142		ng/L		111	70 - 140
Perfluoropentanoic acid (PFPeA)	64.0	64.2		ng/L		100	65 - 135
Perfluorohexanoic acid (PFHxA)	32.0	28.9		ng/L		90	70 - 145
Perfluoroheptanoic acid (PFHpA)	32.0	33.5		ng/L		105	70 - 150
Perfluorooctanoic acid (PFOA)	32.0	34.2		ng/L		107	70 - 150
Perfluorononanoic acid (PFNA)	32.0	33.6		ng/L		105	70 - 150
Perfluorodecanoic acid (PFDA)	32.0	39.0		ng/L		122	70 - 140

Method: Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LCS 320-752267/3-A
Matrix: Water
Analysis Batch: 752549

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 752267

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoroundecanoic acid (PFUnA)	32.0	32.6		ng/L		102	70 - 145
Perfluorododecanoic acid (PFDoA)	32.0	35.4		ng/L		111	70 - 140
Perfluorotridecanoic acid (PFTrDA)	32.0	39.5		ng/L		123	65 - 140
Perfluorotetradecanoic acid (PFTeDA)	32.0	33.9		ng/L		106	60 - 140
Perfluorobutanesulfonic acid (PFBS)	28.4	27.8		ng/L		98	60 - 145
Perfluoropentanesulfonic acid (PFPeS)	30.1	32.1		ng/L		107	65 - 140
Perfluorohexanesulfonic acid (PFHxS)	29.2	28.5		ng/L		98	65 - 145
Perfluoroheptanesulfonic acid (PFHpS)	30.5	30.9		ng/L		101	70 - 150
Perfluorooctanesulfonic acid (PFOS)	29.8	29.8		ng/L		100	55 - 150
Perfluorononanesulfonic acid (PFNS)	30.8	26.9		ng/L		87	65 - 145
Perfluorodecanesulfonic acid (PFDS)	30.8	23.8		ng/L		77	60 - 145
Perfluorododecanesulfonic acid (PFDoS)	31.0	25.8		ng/L		83	50 - 145
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	120	117		ng/L		97	70 - 145
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	122	121		ng/L		99	65 - 155
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	123	133		ng/L		108	60 - 150
Perfluorooctanesulfonamide (PFOSA)	32.0	33.9		ng/L		106	70 - 145
N-methylperfluorooctane sulfonamide (NMeFOSA)	32.0	34.4		ng/L		107	60 - 150
N-ethylperfluorooctane sulfonamide (NEtFOSA)	32.0	28.9		ng/L		90	65 - 145
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	32.0	37.5		ng/L		117	50 - 140
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	32.0	30.4		ng/L		95	70 - 145
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	320	356		ng/L		111	70 - 145
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	320	368		ng/L		115	70 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	128	130		ng/L		101	70 - 140
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	121	118		ng/L		97	65 - 145
Perfluoro-3-methoxypropanoic acid (PFMPA)	64.0	64.4		ng/L		101	55 - 140
Perfluoro-4-methoxybutanoic acid (PFMBA)	64.0	54.2		ng/L		85	60 - 150
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	64.0	67.8		ng/L		106	50 - 150

Method: Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LCS 320-752267/3-A
Matrix: Water
Analysis Batch: 752549

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 752267

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)	120	115		ng/L		96	70 - 155
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	121	118		ng/L		98	55 - 160
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	57.1	58.6		ng/L		103	70 - 140
3-Perfluoropropylpropanoic acid (3:3 FTCA)	160	174		ng/L		109	65 - 130
3-Perfluoropentylpropanoic acid (5:3 FTCA)	799	716		ng/L		90	70 - 135
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	799	643		ng/L		80	50 - 145

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFBA	*69.7*		*5 - 130*
13C5 PFPeA	*82.5*		*40 - 130*
13C5 PFHxA	*88.3*		*40 - 130*
13C4 PFHpA	*79.0*		*40 - 130*
13C8 PFOA	*74.3*		*40 - 130*
13C9 PFNA	*76.7*		*40 - 130*
13C6 PFDA	*65.5*		*40 - 130*
13C7 PFUnA	*68.1*		*30 - 130*
13C2 PFDoA	*56.3*		*10 - 130*
13C2 PFTeDA	*63.3*		*10 - 130*
13C3 PFBS	*70.0*		*40 - 135*
13C3 PFHxS	*70.1*		*40 - 130*
13C8 PFOS	*78.0*		*40 - 130*
13C8 PFOSA	*67.3*		*40 - 130*
d3-NMeFOSAA	*77.5*		*40 - 170*
d5-NEtFOSAA	*78.6*		*25 - 135*
13C2 4:2 FTS	*70.7*		*40 - 200*
13C2 6:2 FTS	*65.4*		*40 - 200*
13C2 8:2 FTS	*78.7*		*40 - 300*
13C3 HFPO-DA	*87.3*		*40 - 130*
d7-N-MeFOSE-M	*72.1*		*10 - 130*
d9-N-EtFOSE-M	*75.5*		*10 - 130*
d5-NEtPFOSA	*69.0*		*10 - 130*
d3-NMePFOSA	*64.8*		*10 - 130*

Lab Sample ID: LLCS 320-752267/2-A
Matrix: Water
Analysis Batch: 752549

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 752267

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	12.8	14.3		ng/L		112	70 - 140
Perfluoropentanoic acid (PFPeA)	6.40	6.55		ng/L		102	65 - 135
Perfluorohexanoic acid (PFHxA)	3.20	3.12		ng/L		97	70 - 145
Perfluoroheptanoic acid (PFHpA)	3.20	3.36		ng/L		105	70 - 150
Perfluorooctanoic acid (PFOA)	3.20	3.48		ng/L		109	70 - 150

Method: Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LLCS 320-752267/2-A
Matrix: Water
Analysis Batch: 752549

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 752267

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorononanoic acid (PFNA)	3.20	3.42		ng/L		107	70 - 150
Perfluorodecanoic acid (PFDA)	3.20	3.63		ng/L		114	70 - 140
Perfluoroundecanoic acid (PFUnA)	3.20	3.23		ng/L		101	70 - 145
Perfluorododecanoic acid (PFDoA)	3.20	3.88		ng/L		121	70 - 140
Perfluorotridecanoic acid (PFTrDA)	3.20	4.22		ng/L		132	65 - 140
Perfluorotetradecanoic acid (PFTeDA)	3.20	3.29		ng/L		103	60 - 140
Perfluorobutanesulfonic acid (PFBS)	2.84	2.75		ng/L		97	60 - 145
Perfluoropentanesulfonic acid (PFPeS)	3.01	3.33		ng/L		111	65 - 140
Perfluorohexanesulfonic acid (PFHxS)	2.92	3.01		ng/L		103	65 - 145
Perfluoroheptanesulfonic acid (PFHpS)	3.05	3.08		ng/L		101	70 - 150
Perfluorooctanesulfonic acid (PFOS)	2.98	2.99		ng/L		100	55 - 150
Perfluorononanesulfonic acid (PFNS)	3.08	2.42		ng/L		79	65 - 145
Perfluorodecanesulfonic acid (PFDS)	3.08	2.26		ng/L		73	60 - 145
Perfluorododecanesulfonic acid (PFDoS)	3.10	2.27		ng/L		73	50 - 145
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	12.0	12.2		ng/L		101	70 - 145
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	12.2	12.6		ng/L		104	65 - 155
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	12.3	13.6		ng/L		111	60 - 150
Perfluorooctanesulfonamide (PFOSA)	3.20	3.37		ng/L		105	70 - 145
N-methylperfluorooctane sulfonamide (NMeFOSA)	3.20	3.27		ng/L		102	60 - 150
N-ethylperfluorooctane sulfonamide (NEtFOSA)	3.20	2.70		ng/L		84	65 - 145
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	3.20	4.13		ng/L		129	50 - 140
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	3.20	3.27		ng/L		102	70 - 145
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	32.0	36.6		ng/L		115	70 - 145
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	32.0	36.8		ng/L		115	70 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	12.8	11.8		ng/L		92	70 - 140
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	12.1	11.6		ng/L		96	65 - 145
Perfluoro-3-methoxypropanoic acid (PFMPA)	6.40	6.44		ng/L		101	55 - 140
Perfluoro-4-methoxybutanoic acid (PFMBA)	6.40	5.02		ng/L		79	60 - 150

Method: Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LLCS 320-752267/2-A
Matrix: Water
Analysis Batch: 752549

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 752267

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits		
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)			6.40	7.05		ng/L		110	50 - 150		
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid(9Cl-PF3ONS)			12.0	11.0		ng/L		92	70 - 155		
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)			12.1	10.5		ng/L		87	55 - 160		
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)			5.71	6.04		ng/L		106	70 - 140		
3-Perfluoropropylpropanoic acid (3:3 FTCA)			16.0	17.0		ng/L		106	65 - 130		
3-Perfluoropentylpropanoic acid (5:3 FTCA)			79.9	72.3		ng/L		91	70 - 135		
3-Perfluoroheptylpropanoic acid (7:3 FTCA)			79.9	62.1		ng/L		78	50 - 145		

Isotope Dilution	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C4 PFBA	*69.4*		*5 - 130*
13C5 PFPeA	*82.5*		*40 - 130*
13C5 PFHxA	*87.3*		*40 - 130*
13C4 PFHpA	*83.9*		*40 - 130*
13C8 PFOA	*71.9*		*40 - 130*
13C9 PFNA	*78.9*		*40 - 130*
13C6 PFDA	*67.7*		*40 - 130*
13C7 PFUnA	*67.5*		*30 - 130*
13C2 PFDoA	*57.1*		*10 - 130*
13C2 PFTeDA	*60.9*		*10 - 130*
13C3 PFBS	*71.0*		*40 - 135*
13C3 PFHxS	*67.9*		*40 - 130*
13C8 PFOS	*78.3*		*40 - 130*
13C8 PFOSA	*62.9*		*40 - 130*
d3-NMeFOSAA	*71.2*		*40 - 170*
d5-NEtFOSAA	*80.8*		*25 - 135*
13C2 4:2 FTS	*75.0*		*40 - 200*
13C2 6:2 FTS	*69.6*		*40 - 200*
13C2 8:2 FTS	*91.3*		*40 - 300*
13C3 HFPO-DA	*89.4*		*40 - 130*
d7-N-MeFOSE-M	*67.1*		*10 - 130*
d9-N-EtFOSE-M	*71.0*		*10 - 130*
d5-NEtPFOSA	*74.1*		*10 - 130*
d3-NMePFOSA	*65.8*		*10 - 130*

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 590-46754/2-A
Matrix: Water
Analysis Batch: 46765

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 46754

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Magnesium	ND		1.0	0.13	mg/L		04/11/24 12:24	04/11/24 13:38	1

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: MB 590-46754/2-A
Matrix: Water
Analysis Batch: 46765

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 46754

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		0.50	0.29	mg/L		04/11/24 12:24	04/11/24 13:38	1
Sodium	ND		0.50	0.20	mg/L		04/11/24 12:24	04/11/24 13:38	1

Lab Sample ID: LCS 590-46754/1-A
Matrix: Water
Analysis Batch: 46765

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 46754

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Magnesium	50.0	55.7		mg/L		111	80 - 120
Potassium	50.0	52.8		mg/L		106	80 - 135
Sodium	50.0	53.6		mg/L		107	80 - 154

Lab Sample ID: 590-23966-3 MS
Matrix: Water
Analysis Batch: 46765

Client Sample ID: MW-2A-032524
Prep Type: Total Recoverable
Prep Batch: 46754

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Magnesium	16		50.0	69.9		mg/L		108	75 - 125
Potassium	6.8		50.0	59.6		mg/L		105	75 - 125
Sodium	37		50.0	87.1		mg/L		100	75 - 125

Lab Sample ID: 590-23966-3 MSD
Matrix: Water
Analysis Batch: 46765

Client Sample ID: MW-2A-032524
Prep Type: Total Recoverable
Prep Batch: 46754

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Magnesium	16		50.0	68.9		mg/L		106	75 - 125	1	20
Potassium	6.8		50.0	58.7		mg/L		104	75 - 125	2	20
Sodium	37		50.0	86.1		mg/L		98	75 - 125	1	20

Lab Sample ID: 590-23966-3 DU
Matrix: Water
Analysis Batch: 46765

Client Sample ID: MW-2A-032524
Prep Type: Total Recoverable
Prep Batch: 46754

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Magnesium	16		15.1		mg/L		3	20
Potassium	6.8		6.75		mg/L		1	20
Sodium	37		35.9		mg/L		3	20

Lab Sample ID: MB 590-46752/2-C
Matrix: Water
Analysis Batch: 46765

Client Sample ID: Method Blank
Prep Type: Dissolved
Prep Batch: 46762

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		2.0	0.20	mg/L		04/11/24 10:49	04/11/24 14:40	1
Magnesium	ND		1.0	0.13	mg/L		04/11/24 10:49	04/11/24 14:40	1

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: LCS 590-46752/1-C
Matrix: Water
Analysis Batch: 46765

Client Sample ID: Lab Control Sample
Prep Type: Dissolved
Prep Batch: 46762

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Calcium			50.0	54.0		mg/L		108	80 - 120		
Magnesium			50.0	54.3		mg/L		109	80 - 120		

Lab Sample ID: 590-23966-1 MS
Matrix: Water
Analysis Batch: 46765

Client Sample ID: MW-12A-032524
Prep Type: Dissolved
Prep Batch: 46762

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Calcium	29		50.0	87.8		mg/L		117	75 - 125		
Magnesium	10		50.0	68.9		mg/L		117	75 - 125		

Lab Sample ID: 590-23966-1 MSD
Matrix: Water
Analysis Batch: 46765

Client Sample ID: MW-12A-032524
Prep Type: Dissolved
Prep Batch: 46762

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Magnesium	10		50.0	68.0		mg/L		115	75 - 125	1	20

Lab Sample ID: 590-23966-1 MSD
Matrix: Water
Analysis Batch: 46770

Client Sample ID: MW-12A-032524
Prep Type: Dissolved
Prep Batch: 46762

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Calcium	29		50.0	85.5		mg/L		112	75 - 125	3	20

Lab Sample ID: 590-23966-1 DU
Matrix: Water
Analysis Batch: 46765

Client Sample ID: MW-12A-032524
Prep Type: Dissolved
Prep Batch: 46762

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Calcium	29		31.5		mg/L		7	20
Magnesium	10		13.1	F3	mg/L		25	20

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 580-455843/22-A
Matrix: Water
Analysis Batch: 456090

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 455843

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0010	mg/L		04/05/24 16:45	04/08/24 22:33	5
Cadmium	ND		0.0020	0.00019	mg/L		04/05/24 16:45	04/08/24 22:33	5
Iron	ND		0.50	0.067	mg/L		04/05/24 16:45	04/08/24 22:33	5
Lead	ND		0.0020	0.00020	mg/L		04/05/24 16:45	04/08/24 22:33	5
Manganese	ND		0.010	0.0023	mg/L		04/05/24 16:45	04/08/24 22:33	5
Zinc	ND		0.035	0.0046	mg/L		04/05/24 16:45	04/08/24 22:33	5

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 580-455843/23-A
Matrix: Water
Analysis Batch: 456090

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 455843

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	1.00	0.944		mg/L		94	80 - 120
Cadmium	1.00	0.943		mg/L		94	80 - 120
Iron	20.0	19.6		mg/L		98	80 - 120
Lead	1.00	0.959		mg/L		96	80 - 120
Manganese	1.00	1.08		mg/L		108	80 - 120
Zinc	1.00	1.01		mg/L		101	80 - 120

Lab Sample ID: LCSD 580-455843/24-A
Matrix: Water
Analysis Batch: 456090

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 455843

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	1.00	0.966		mg/L		97	80 - 120	2	20
Cadmium	1.00	0.948		mg/L		95	80 - 120	1	20
Iron	20.0	20.0		mg/L		100	80 - 120	2	20
Lead	1.00	0.967		mg/L		97	80 - 120	1	20
Manganese	1.00	0.978		mg/L		98	80 - 120	10	20
Zinc	1.00	1.02		mg/L		102	80 - 120	2	20

Lab Sample ID: MB 580-455235/1-B
Matrix: Water
Analysis Batch: 455760

Client Sample ID: Method Blank
Prep Type: Dissolved
Prep Batch: 455378

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00020	mg/L		04/01/24 17:48	04/04/24 15:27	1
Cadmium	ND		0.00040	0.000037	mg/L		04/01/24 17:48	04/04/24 15:27	1
Iron	ND		0.10	0.013	mg/L		04/01/24 17:48	04/04/24 15:27	1
Lead	ND		0.00040	0.000040	mg/L		04/01/24 17:48	04/04/24 15:27	1
Manganese	ND		0.0020	0.00046	mg/L		04/01/24 17:48	04/04/24 15:27	1
Zinc	ND		0.0070	0.00093	mg/L		04/01/24 17:48	04/04/24 15:27	1

Lab Sample ID: LCS 580-455235/2-B
Matrix: Water
Analysis Batch: 455760

Client Sample ID: Lab Control Sample
Prep Type: Dissolved
Prep Batch: 455378

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	1.00	1.01		mg/L		101	80 - 120
Cadmium	1.00	1.01		mg/L		101	80 - 120
Iron	20.0	20.0		mg/L		100	80 - 120
Lead	1.00	1.00		mg/L		100	80 - 120
Manganese	1.00	1.01		mg/L		101	80 - 120
Zinc	1.00	1.03		mg/L		103	80 - 120

Lab Sample ID: LCSD 580-455235/3-B
Matrix: Water
Analysis Batch: 455760

Client Sample ID: Lab Control Sample Dup
Prep Type: Dissolved
Prep Batch: 455378

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	1.00	0.991		mg/L		99	80 - 120	2	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 580-455235/3-B
Matrix: Water
Analysis Batch: 455760

Client Sample ID: Lab Control Sample Dup
Prep Type: Dissolved
Prep Batch: 455378

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Cadmium			1.00	1.00		mg/L		100	80 - 120	1	20
Iron			20.0	19.6		mg/L		98	80 - 120	2	20
Lead			1.00	0.970		mg/L		97	80 - 120	3	20
Manganese			1.00	1.00		mg/L		100	80 - 120	1	20
Zinc			1.00	1.02		mg/L		102	80 - 120	1	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 590-46753/2-A
Matrix: Water
Analysis Batch: 46767

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 46753

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.120	J	0.20	0.090	ug/L		04/11/24 12:20	04/11/24 16:44	1

Lab Sample ID: LCS 590-46753/1-A
Matrix: Water
Analysis Batch: 46767

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 46753

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury			2.00	1.88		ug/L		94	80 - 120		

Lab Sample ID: 590-23966-1 MS
Matrix: Water
Analysis Batch: 46767

Client Sample ID: MW-12A-032524
Prep Type: Total/NA
Prep Batch: 46753

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury	0.12	J B	2.00	1.94		ug/L		91	80 - 120		

Lab Sample ID: 590-23966-1 MSD
Matrix: Water
Analysis Batch: 46767

Client Sample ID: MW-12A-032524
Prep Type: Total/NA
Prep Batch: 46753

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.12	J B	2.00	1.97		ug/L		93	80 - 120	2	20

Lab Sample ID: 590-23966-1 DU
Matrix: Water
Analysis Batch: 46767

Client Sample ID: MW-12A-032524
Prep Type: Total/NA
Prep Batch: 46753

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Mercury	0.12	J B		0.120	J	ug/L				0	20

Lab Sample ID: MB 590-46752/2-B
Matrix: Water
Analysis Batch: 46767

Client Sample ID: Method Blank
Prep Type: Dissolved
Prep Batch: 46761

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.130	J	0.20	0.090	ug/L		04/11/24 10:46	04/11/24 17:14	1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 590-46752/1-B
Matrix: Water
Analysis Batch: 46767

Client Sample ID: Lab Control Sample
Prep Type: Dissolved
Prep Batch: 46761

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury			2.00	1.91		ug/L		96	80 - 120		

Lab Sample ID: 590-23966-3 MS
Matrix: Water
Analysis Batch: 46767

Client Sample ID: MW-2A-032524
Prep Type: Dissolved
Prep Batch: 46761

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury	0.12	J B	2.00	1.88		ug/L		88	80 - 120		

Lab Sample ID: 590-23966-3 MSD
Matrix: Water
Analysis Batch: 46767

Client Sample ID: MW-2A-032524
Prep Type: Dissolved
Prep Batch: 46761

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.12	J B	2.00	1.91		ug/L		90	80 - 120	2	20

Lab Sample ID: 590-23966-3 DU
Matrix: Water
Analysis Batch: 46767

Client Sample ID: MW-2A-032524
Prep Type: Dissolved
Prep Batch: 46761

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	0.12	J B	0.130	J	ug/L		8	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 280-648894/111
Matrix: Water
Analysis Batch: 648894

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N	ND		0.10	0.029	mg/L			04/09/24 17:27	1

Lab Sample ID: LCS 280-648894/112
Matrix: Water
Analysis Batch: 648894

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Ammonia as N			2.50	2.72		mg/L		109	90 - 110		

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 590-46763/1
Matrix: Water
Analysis Batch: 46763

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	5.00	J	20	5.0	mg/L			04/08/24 14:00	1
Bicarbonate Alkalinity as CaCO3	5.00	J	20	5.0	mg/L			04/08/24 14:00	1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: LCS 590-46763/2
Matrix: Water
Analysis Batch: 46763

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	501	500		mg/L		100	90 - 110

Lab Sample ID: 590-23966-1 DU
Matrix: Water
Analysis Batch: 46763

Client Sample ID: MW-12A-032524
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	110	B	105		mg/L		5	10
Bicarbonate Alkalinity as CaCO3	110	B	105		mg/L		5	10

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 590-46672/1
Matrix: Water
Analysis Batch: 46672

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		25	13	mg/L			04/01/24 15:21	1

Lab Sample ID: LCS 590-46672/2
Matrix: Water
Analysis Batch: 46672

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	503	490		mg/L		97	80 - 120

Lab Sample ID: MB 590-46726/1
Matrix: Water
Analysis Batch: 46726

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		25	13	mg/L			04/03/24 15:26	1

Lab Sample ID: LCS 590-46726/2
Matrix: Water
Analysis Batch: 46726

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	503	481		mg/L		96	80 - 120

Method: SM 5310B - Organic Carbon, Total (TOC)

Lab Sample ID: MB 280-648036/35
Matrix: Water
Analysis Batch: 648036

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	ND		1.0	0.35	mg/L			04/02/24 01:12	1

Method: SM 5310B - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: LCS 280-648036/34
Matrix: Water
Analysis Batch: 648036

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Organic Carbon - Duplicates			25.0	23.9		mg/L		96	88 - 112		

Client Sample ID: MW-12A-032524

Lab Sample ID: 590-23966-1

Date Collected: 03/25/24 13:06

Matrix: Water

Date Received: 03/28/24 08:37

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	43 mL	43 mL	46631	04/05/24 15:38	JSP	EET SPK
Total/NA	Prep	3510C			269 mL	1 mL	455296	04/01/24 09:03	TOA	EET SEA
Total/NA	Analysis	8270C SIM ID		1	1 mL	1 mL	455319	04/01/24 17:20	K1K	EET SEA
Total/NA	Analysis	300.0		1	5 mL	5 mL	46500	03/28/24 11:53	NMI	EET SPK
Total/NA	Analysis	300.0		1	5 mL	5 mL	46501	03/28/24 11:53	NMI	EET SPK
Dissolved	Filtration	FILTRATION			250 mL	250 mL	46752	04/11/24 10:16	AMB	EET SPK
Dissolved	Prep	3005A			50 mL	50 mL	46762	04/11/24 10:49	AMB	EET SPK
Dissolved	Analysis	6010D		1			46765	04/11/24 14:45	AMB	EET SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	46754	04/11/24 12:24	AMB	EET SPK
Total Recoverable	Analysis	6010D		1			46765	04/11/24 13:43	AMB	EET SPK
Dissolved	Filtration	FILTRATION			100 mL	100 mL	455235	03/29/24 18:10	JLS	EET SEA
Dissolved	Prep	3005A			50 mL	50 mL	455378	04/01/24 17:48	AUA	EET SEA
Dissolved	Analysis	6020B		5	50 mL	50 mL	455760	04/04/24 16:44	FCW	EET SEA
Total Recoverable	Prep	3005A			50 mL	50 mL	455843	04/05/24 16:45	TMH	EET SEA
Total Recoverable	Analysis	6020B		5	50 mL	50 mL	456090	04/08/24 23:54	FCW	EET SEA
Dissolved	Filtration	FILTRATION			250 mL	250 mL	46752	04/11/24 10:16	AMB	EET SPK
Dissolved	Prep	7470A			50 mL	50 mL	46761	04/11/24 10:46	AMB	EET SPK
Dissolved	Analysis	7470A		1			46767	04/11/24 17:17	AMB	EET SPK
Total/NA	Prep	7470A			50 mL	50 mL	46753	04/11/24 12:21	AMB	EET SPK
Total/NA	Analysis	7470A		1			46767	04/11/24 16:47	AMB	EET SPK
Total/NA	Analysis	350.1		1	10 mL	10 mL	648894	04/09/24 17:59	LBR	EET DEN
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	46763	04/08/24 14:00	AMB	EET SPK
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	46672	04/01/24 15:21	AMB	EET SPK
Total/NA	Analysis	SM 5310B		1	20 mL	20 mL	648036	04/02/24 07:18	ABW	EET DEN

Client Sample ID: MW-15A-032524

Lab Sample ID: 590-23966-2

Date Collected: 03/25/24 11:40

Matrix: Water

Date Received: 03/28/24 08:37

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1633			549 mL	5.0 mL	752267	04/04/24 04:12	HJA	EET SAC
Total/NA	Analysis	Draft-4 1633		1	1 mL	1 mL	752549	04/05/24 10:47	SEY	EET SAC

Client Sample ID: MW-2A-032524

Lab Sample ID: 590-23966-3

Date Collected: 03/26/24 11:25

Matrix: Water

Date Received: 03/28/24 08:37

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	43 mL	43 mL	46631	04/05/24 15:59	JSP	EET SPK
Total/NA	Prep	3510C			266.1 mL	1 mL	455296	04/01/24 09:03	TOA	EET SEA
Total/NA	Analysis	8270C SIM ID		1	1 mL	1 mL	455319	04/01/24 17:33	K1K	EET SEA
Total/NA	Analysis	300.0		1	5 mL	5 mL	46500	03/28/24 12:53	NMI	EET SPK
Total/NA	Analysis	300.0		1	5 mL	5 mL	46501	03/28/24 12:53	NMI	EET SPK

Client Sample ID: MW-2A-032524

Lab Sample ID: 590-23966-3

Date Collected: 03/26/24 11:25

Matrix: Water

Date Received: 03/28/24 08:37

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1633			555.4 mL	5.0 mL	752267	04/04/24 04:12	HJA	EET SAC
Total/NA	Analysis	Draft-4 1633		1	1 mL	1 mL	752549	04/05/24 13:08	SEY	EET SAC
Total/NA	Prep	1633	RA		555.4 mL	5.0 mL	752267	04/04/24 04:12	HJA	EET SAC
Total/NA	Analysis	Draft-4 1633	RA	1	1 mL	1 mL	753285	04/08/24 18:43	S1M	EET SAC
Dissolved	Filtration	FILTRATION			250 mL	250 mL	46752	04/11/24 10:16	AMB	EET SPK
Dissolved	Prep	3005A			50 mL	50 mL	46762	04/11/24 10:49	AMB	EET SPK
Dissolved	Analysis	6010D		1			46765	04/11/24 14:49	AMB	EET SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	46754	04/11/24 12:24	AMB	EET SPK
Total Recoverable	Analysis	6010D		1			46765	04/11/24 13:47	AMB	EET SPK
Dissolved	Filtration	FILTRATION			100 mL	100 mL	455235	03/29/24 18:10	JLS	EET SEA
Dissolved	Prep	3005A			50 mL	50 mL	455378	04/01/24 17:48	AUA	EET SEA
Dissolved	Analysis	6020B		5	50 mL	50 mL	455760	04/04/24 16:49	FCW	EET SEA
Total Recoverable	Prep	3005A			50 mL	50 mL	455843	04/05/24 16:45	TMH	EET SEA
Total Recoverable	Analysis	6020B		5	50 mL	50 mL	456090	04/08/24 23:56	FCW	EET SEA
Dissolved	Filtration	FILTRATION			250 mL	250 mL	46752	04/11/24 10:16	AMB	EET SPK
Dissolved	Prep	7470A			50 mL	50 mL	46761	04/11/24 10:46	AMB	EET SPK
Dissolved	Analysis	7470A		1			46767	04/11/24 17:27	AMB	EET SPK
Total/NA	Prep	7470A			50 mL	50 mL	46753	04/11/24 12:21	AMB	EET SPK
Total/NA	Analysis	7470A		1			46767	04/11/24 16:57	AMB	EET SPK
Total/NA	Analysis	350.1		1	10 mL	10 mL	648894	04/09/24 18:12	LBR	EET DEN
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	46763	04/08/24 14:00	AMB	EET SPK
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	46672	04/01/24 15:21	AMB	EET SPK
Total/NA	Analysis	SM 5310B		1	20 mL	20 mL	648036	04/02/24 07:34	ABW	EET DEN

Client Sample ID: MW-8A-032524

Lab Sample ID: 590-23966-4

Date Collected: 03/26/24 12:35

Matrix: Water

Date Received: 03/28/24 08:37

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1633			543.5 mL	5.0 mL	752267	04/04/24 04:12	HJA	EET SAC
Total/NA	Analysis	Draft-4 1633		1	1 mL	1 mL	752549	04/05/24 13:25	SEY	EET SAC

Client Sample ID: MW-9A-032524

Lab Sample ID: 590-23966-5

Date Collected: 03/26/24 13:40

Matrix: Water

Date Received: 03/28/24 08:37

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1633			559.7 mL	5.0 mL	752267	04/04/24 04:12	HJA	EET SAC
Total/NA	Analysis	Draft-4 1633		1	1 mL	1 mL	752549	04/05/24 13:43	SEY	EET SAC

Lab Chronicle

Client: GeoEngineers Inc
Job ID: 590-23966-1
Project/Site: Marshall Landfill/0504-104-01

Client Sample ID: MW-16A-032524
Lab Sample ID: 590-23966-6
Date Collected: 03/26/24 14:36
Matrix: Water
Date Received: 03/28/24 08:37

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1633			545.7 mL	5.0 mL	752267	04/04/24 04:12	HJA	EET SAC
Total/NA	Analysis	Draft-4 1633		1	1 mL	1 mL	752549	04/05/24 14:01	SEY	EET SAC

Client Sample ID: MW-7B-032524
Lab Sample ID: 590-23966-7
Date Collected: 03/27/24 09:25
Matrix: Water
Date Received: 03/28/24 08:37

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	43 mL	43 mL	46631	04/05/24 16:20	JSP	EET SPK
Total/NA	Prep	3510C			270.9 mL	1 mL	455296	04/01/24 09:03	TOA	EET SEA
Total/NA	Analysis	8270C SIM ID		1	1 mL	1 mL	455319	04/01/24 17:47	K1K	EET SEA
Total/NA	Analysis	300.0		1	5 mL	5 mL	46500	03/28/24 13:03	NMI	EET SPK
Total/NA	Analysis	300.0		1	5 mL	5 mL	46501	03/28/24 13:03	NMI	EET SPK
Total/NA	Prep	1633			477.3 mL	5.0 mL	752267	04/04/24 04:12	HJA	EET SAC
Total/NA	Analysis	Draft-4 1633		1	1 mL	1 mL	752549	04/05/24 14:18	SEY	EET SAC
Dissolved	Filtration	FILTRATION			250 mL	250 mL	46752	04/11/24 10:16	AMB	EET SPK
Dissolved	Prep	3005A			50 mL	50 mL	46762	04/11/24 10:49	AMB	EET SPK
Dissolved	Analysis	6010D		1			46765	04/11/24 15:26	AMB	EET SPK
Dissolved	Filtration	FILTRATION			250 mL	250 mL	46752	04/11/24 10:16	AMB	EET SPK
Dissolved	Prep	3005A			50 mL	50 mL	46762	04/11/24 10:49	AMB	EET SPK
Dissolved	Analysis	6010D		1			46770	04/11/24 17:44	AMB	EET SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	46754	04/11/24 12:24	AMB	EET SPK
Total Recoverable	Analysis	6010D		1			46765	04/11/24 14:11	AMB	EET SPK
Dissolved	Filtration	FILTRATION			100 mL	100 mL	455235	03/29/24 18:10	JLS	EET SEA
Dissolved	Prep	3005A			50 mL	50 mL	455378	04/01/24 17:48	AUA	EET SEA
Dissolved	Analysis	6020B		5	50 mL	50 mL	455760	04/04/24 16:52	FCW	EET SEA
Total Recoverable	Prep	3005A			50 mL	50 mL	455843	04/05/24 16:45	TMH	EET SEA
Total Recoverable	Analysis	6020B		5	50 mL	50 mL	456090	04/08/24 23:59	FCW	EET SEA
Dissolved	Filtration	FILTRATION			250 mL	250 mL	46752	04/11/24 10:16	AMB	EET SPK
Dissolved	Prep	7470A			50 mL	50 mL	46761	04/11/24 10:46	AMB	EET SPK
Dissolved	Analysis	7470A		1			46767	04/11/24 17:30	AMB	EET SPK
Total/NA	Prep	7470A			50 mL	50 mL	46753	04/11/24 12:21	AMB	EET SPK
Total/NA	Analysis	7470A		1			46767	04/11/24 16:59	AMB	EET SPK
Total/NA	Analysis	350.1		1	10 mL	10 mL	648894	04/09/24 18:14	LBR	EET DEN
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	46763	04/08/24 14:00	AMB	EET SPK
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	46726	04/03/24 15:26	AMB	EET SPK
Total/NA	Analysis	SM 5310B		1	20 mL	20 mL	648036	04/02/24 07:50	ABW	EET DEN

Client Sample ID: MW-5A-032524
Lab Sample ID: 590-23966-8
Date Collected: 03/27/24 10:45
Matrix: Water
Date Received: 03/28/24 08:37

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	43 mL	43 mL	46631	04/05/24 16:41	JSP	EET SPK

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: Marshall Landfill/0504-104-01

Job ID: 590-23966-1

Client Sample ID: MW-5A-032524

Date Collected: 03/27/24 10:45
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			262.2 mL	1 mL	455296	04/01/24 09:03	TOA	EET SEA
Total/NA	Analysis	8270C SIM ID		1	1 mL	1 mL	455319	04/01/24 18:01	K1K	EET SEA
Total/NA	Analysis	300.0		1	5 mL	5 mL	46500	03/28/24 13:13	NMI	EET SPK
Total/NA	Analysis	300.0		1	5 mL	5 mL	46501	03/28/24 13:13	NMI	EET SPK
Total/NA	Prep	1633			558.7 mL	5.0 mL	752267	04/04/24 04:12	HJA	EET SAC
Total/NA	Analysis	Draft-4 1633		1	1 mL	1 mL	752549	04/05/24 14:36	SEY	EET SAC
Dissolved	Filtration	FILTRATION			250 mL	250 mL	46752	04/11/24 10:16	AMB	EET SPK
Dissolved	Prep	3005A			50 mL	50 mL	46762	04/11/24 10:49	AMB	EET SPK
Dissolved	Analysis	6010D		1			46765	04/11/24 15:30	AMB	EET SPK
Dissolved	Filtration	FILTRATION			250 mL	250 mL	46752	04/11/24 10:16	AMB	EET SPK
Dissolved	Prep	3005A			50 mL	50 mL	46762	04/11/24 10:49	AMB	EET SPK
Dissolved	Analysis	6010D		1			46770	04/11/24 17:48	AMB	EET SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	46754	04/11/24 12:24	AMB	EET SPK
Total Recoverable	Analysis	6010D		1			46765	04/11/24 14:28	AMB	EET SPK
Dissolved	Filtration	FILTRATION			100 mL	100 mL	455235	03/29/24 18:10	JLS	EET SEA
Dissolved	Prep	3005A			50 mL	50 mL	455378	04/01/24 17:48	AUA	EET SEA
Dissolved	Analysis	6020B		5	50 mL	50 mL	455760	04/04/24 16:38	FCW	EET SEA
Total Recoverable	Prep	3005A			50 mL	50 mL	455843	04/05/24 16:45	TMH	EET SEA
Total Recoverable	Analysis	6020B		5	50 mL	50 mL	456090	04/09/24 00:02	FCW	EET SEA
Dissolved	Filtration	FILTRATION			250 mL	250 mL	46752	04/11/24 10:16	AMB	EET SPK
Dissolved	Prep	7470A			50 mL	50 mL	46761	04/11/24 10:46	AMB	EET SPK
Dissolved	Analysis	7470A		1			46767	04/11/24 17:32	AMB	EET SPK
Total/NA	Prep	7470A			50 mL	50 mL	46753	04/11/24 12:21	AMB	EET SPK
Total/NA	Analysis	7470A		1			46767	04/11/24 17:02	AMB	EET SPK
Total/NA	Analysis	350.1		1	10 mL	10 mL	648894	04/09/24 18:23	LBR	EET DEN
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	46763	04/08/24 14:00	AMB	EET SPK
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	46726	04/03/24 15:26	AMB	EET SPK
Total/NA	Analysis	SM 5310B		1	20 mL	20 mL	648036	04/02/24 08:05	ABW	EET DEN

Client Sample ID: DUP-032724

Date Collected: 03/27/24 12:00
Date Received: 03/28/24 08:37

Lab Sample ID: 590-23966-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	43 mL	43 mL	46631	04/05/24 17:01	JSP	EET SPK
Total/NA	Prep	3510C			243.2 mL	1 mL	455296	04/01/24 09:03	TOA	EET SEA
Total/NA	Analysis	8270C SIM ID		1	1 mL	1 mL	455319	04/01/24 18:15	K1K	EET SEA
Total/NA	Analysis	300.0		1	5 mL	5 mL	46500	03/28/24 13:23	NMI	EET SPK
Total/NA	Analysis	300.0		1	5 mL	5 mL	46501	03/28/24 13:23	NMI	EET SPK
Total/NA	Prep	1633			540.4 mL	5.0 mL	752267	04/04/24 04:12	HJA	EET SAC
Total/NA	Analysis	Draft-4 1633		1	1 mL	1 mL	752549	04/05/24 14:54	SEY	EET SAC
Dissolved	Filtration	FILTRATION			250 mL	250 mL	46752	04/11/24 10:16	AMB	EET SPK
Dissolved	Prep	3005A			50 mL	50 mL	46762	04/11/24 10:49	AMB	EET SPK
Dissolved	Analysis	6010D		1			46765	04/11/24 15:34	AMB	EET SPK

Lab Chronicle

Client: GeoEngineers Inc
Job ID: 590-23966-1
Project/Site: Marshall Landfill/0504-104-01

Client Sample ID: DUP-032724
Lab Sample ID: 590-23966-9
Date Collected: 03/27/24 12:00
Matrix: Water
Date Received: 03/28/24 08:37

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			250 mL	250 mL	46752	04/11/24 10:16	AMB	EET SPK
Dissolved	Prep	3005A			50 mL	50 mL	46762	04/11/24 10:49	AMB	EET SPK
Dissolved	Analysis	6010D		1			46770	04/11/24 17:52	AMB	EET SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	46754	04/11/24 12:24	AMB	EET SPK
Total Recoverable	Analysis	6010D		1			46765	04/11/24 14:32	AMB	EET SPK
Dissolved	Filtration	FILTRATION			100 mL	100 mL	455235	03/29/24 18:10	JLS	EET SEA
Dissolved	Prep	3005A			50 mL	50 mL	455378	04/01/24 17:48	AUA	EET SEA
Dissolved	Analysis	6020B		5	50 mL	50 mL	455760	04/04/24 16:41	FCW	EET SEA
Total Recoverable	Prep	3005A			50 mL	50 mL	455843	04/05/24 16:45	TMH	EET SEA
Total Recoverable	Analysis	6020B		5	50 mL	50 mL	456090	04/09/24 00:05	FCW	EET SEA
Dissolved	Filtration	FILTRATION			250 mL	250 mL	46752	04/11/24 10:16	AMB	EET SPK
Dissolved	Prep	7470A			50 mL	50 mL	46761	04/11/24 10:46	AMB	EET SPK
Dissolved	Analysis	7470A		1			46767	04/11/24 17:40	AMB	EET SPK
Total/NA	Prep	7470A			50 mL	50 mL	46753	04/11/24 12:21	AMB	EET SPK
Total/NA	Analysis	7470A		1			46767	04/11/24 17:09	AMB	EET SPK
Total/NA	Analysis	350.1		1	10 mL	10 mL	648894	04/09/24 18:25	LBR	EET DEN
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	46763	04/08/24 14:00	AMB	EET SPK
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	46726	04/03/24 15:26	AMB	EET SPK
Total/NA	Analysis	SM 5310B		1	20 mL	20 mL	648036	04/02/24 08:52	ABW	EET DEN

Client Sample ID: FB-032524
Lab Sample ID: 590-23966-10
Date Collected: 03/25/24 11:06
Matrix: Water
Date Received: 03/28/24 08:37

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1633			554.5 mL	5.0 mL	752267	04/04/24 04:12	HJA	EET SAC
Total/NA	Analysis	Draft-4 1633		1	1 mL	1 mL	752549	04/05/24 15:46	SEY	EET SAC

Client Sample ID: TB-2/26
Lab Sample ID: 590-23966-11
Date Collected: 03/26/24 00:00
Matrix: Water
Date Received: 03/28/24 08:37

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	43 mL	43 mL	46631	04/05/24 17:43	JSP	EET SPK

Laboratory References:

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600
EET SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310
EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Accreditation/Certification Summary

Client: GeoEngineers Inc
Job ID: 590-23966-1
Project/Site: Marshall Landfill/0504-104-01

Laboratory: Eurofins Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State	C569	01-07-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
SM 2320B		Water	Bicarbonate Alkalinity as CaCO3

Laboratory: Eurofins Denver

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

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	06-11-24
A2LA	ISO/IEC 17025	2907.01	06-11-24
Alabama	State Program	40730	09-30-12 *
Alaska (UST)	State	18-001	06-26-24
Arizona	State	AZ0713	07-30-24
Arkansas DEQ	State	19-047-0	04-21-24
California	State	2513	01-08-25
Colorado	Petroleum Storage Tank Program	4025 (or)	01-08-25
Connecticut	State	PH-0686	09-30-24
Florida	NELAP	E87667-57	04-25-24
Georgia	State	4025-011	01-08-25
Illinois	NELAP	2000172024-9	04-17-24
Iowa	State	370	08-04-24
Kansas	NELAP	E-10166	04-30-24
Kentucky (WW)	State	KY98047	12-31-24
Louisiana	NELAP	30785	06-30-14 *
Louisiana (All)	NELAP	30785	06-17-24
Minnesota	NELAP	1788752	05-12-24
Nevada	State	CO000262024-08	05-01-24
New Hampshire	NELAP	2053	04-28-24
New Jersey	NELAP	230001	06-30-24
New York	NELAP	59923	04-01-25
Oklahoma	NELAP	8614	08-31-24
Oregon	NELAP	4025	05-20-24
Pennsylvania	NELAP	013	07-08-24
South Carolina	State	72002001	01-08-24 *
Texas	NELAP	TX104704183-08-TX	09-30-09 *
Texas	NELAP	T104704183-23-23	09-30-24
USDA	US Federal Programs	P330-20-00065	12-19-25
Utah	NELAP	QUAN5	06-30-13 *
Utah	NELAP	CO000262019-11	05-29-24
Virginia	NELAP	460232	06-14-24
Washington	State	C583	08-03-24
West Virginia DEP	State	354	06-10-24
Wisconsin	State	999615430	08-19-24
Wyoming (UST)	A2LA	2907.01	06-11-24

Laboratory: Eurofins Sacramento

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

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

Accreditation/Certification Summary

Client: GeoEngineers Inc
Job ID: 590-23966-1
Project/Site: Marshall Landfill/0504-104-01

Laboratory: Eurofins Sacramento (Continued)

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	06-10-24
ANAB	Dept. of Defense ELAP	L2468	01-20-27
ANAB	Dept. of Energy	L2468.01	01-20-27
ANAB	ISO/IEC 17025	L2468	01-20-27
Arizona	State	AZ0708	08-11-24
Arkansas DEQ	State	88-0691	05-18-24
California	State	2897	01-31-26
Colorado	State	CA00044	08-31-24
Florida	NELAP	E87570	06-30-24
Georgia	State	4040	01-29-25
Hawaii	State	Eurofins Sacramento	01-29-25
Illinois	NELAP	200060	03-31-25
Kansas	NELAP	E-10375	05-22-24
Louisiana	NELAP	01944	06-30-24
Louisiana (All)	NELAP	01944	06-30-24
Maine	State	CA00004	04-14-24
Michigan	State	9947	08-18-24
Nevada	State	CA00044	05-19-24
New Hampshire	NELAP	2997	04-16-24
New Jersey	NELAP	CA005	04-18-24
New York	NELAP	11666	04-01-25
Ohio	State	41252	01-29-25
Oregon	NELAP	4040	07-16-24
Texas	NELAP	T104704399-23-17	05-31-24
US Fish & Wildlife	US Federal Programs	A22139	04-30-24
USDA	US Federal Programs	P330-18-00239	02-28-26
Utah	NELAP	CA000442023-16	02-28-25
Virginia	NELAP	460278	03-14-25
Washington	State	C581	05-05-24
West Virginia (DW)	State	9930C	01-31-25
Wisconsin	State	998204680	05-06-24
Wyoming	State Program	8TMS-L	01-28-19 *

Laboratory: Eurofins Seattle

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-004	02-19-25
ANAB	Dept. of Defense ELAP	L2236	08-07-24
ANAB	Dept. of Energy	L2236	08-07-24
ANAB	ISO/IEC 17025	L2236	08-07-24
California	State	2954	07-07-24
Florida	NELAP	E87575	06-30-24
Louisiana	NELAP	03073	06-30-24
Louisiana (All)	NELAP	03073	06-30-24
Maine	State	WA01273	05-02-24
Montana (UST)	State	NA	04-14-27
New Jersey	NELAP	WA014	06-30-24
New York	NELAP	11662	04-01-25
Oregon	NELAP	4167	07-07-24

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

Accreditation/Certification Summary

Client: GeoEngineers Inc
Job ID: 590-23966-1
Project/Site: Marshall Landfill/0504-104-01

Laboratory: Eurofins Seattle (Continued)

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

Authority	Program	Identification Number	Expiration Date
US Fish & Wildlife	US Federal Programs	A20571	06-30-24
USDA	US Federal Programs	525-23-4-22573	01-04-26
Washington	State	C788-24	07-13-24
Wisconsin	State	399133460	08-31-24

Method Summary

Client: GeoEngineers Inc
Project/Site: Marshall Landfill/0504-104-01

Job ID: 590-23966-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET SPK
8270C SIM ID	Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)	SW846	EET SEA
300.0	Anions, Ion Chromatography	EPA	EET SPK
Draft-4 1633	Per- and Polyfluoroalkyl Substances by LC/MS/MS	EPA	EET SAC
6010D	Metals (ICP)	SW846	EET SPK
6020B	Metals (ICP/MS)	SW846	EET SEA
7470A	Mercury (CVAA)	SW846	EET SPK
350.1	Nitrogen, Ammonia	EPA	EET DEN
SM 2320B	Alkalinity	SM	EET SPK
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET SPK
SM 5310B	Organic Carbon, Total (TOC)	SM	EET DEN
1633	Solid-Phase Extraction (SPE)	EPA	EET SAC
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SEA
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SPK
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET SEA
5030C	Purge and Trap	SW846	EET SPK
7470A	Preparation, Mercury	SW846	EET SPK
FILTRATION	Sample Filtration	None	EET SEA
FILTRATION	Sample Filtration	None	EET SPK

Protocol References:

EPA = US Environmental Protection Agency
None = None
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600
EET SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310
EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Eurofins Spokane
11922 East 1st Ave
Spokane, WA 99206
Phone (509) 924-9200 Phone (509) 924-9290

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler: Morea Schofield	Lab PM: Arrington, Randee E	Carrier Tracking No(s):	COC No: 590-9177-2634 1
Client Contact: Justin Orr / Sydney Bronson	Phone: 509.999.6413	E-Mail: Randee.Arrington@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: GeoEngineers Inc	PWSID:			Job #:
Address: 523 East Second Ave	Due Date Requested:			
City: Spokane	TAT Requested (days): STAT			
State, Zip: WA, 99202	Compliance Project: Δ Yes Δ No			
Phone:	PO #: Purchase Order not required			
Email: jorr@geoengineers.com / sbronson@geo-engineers.com	WO #:			
Project Name: Marshall Landfill	Project #: ~~50002009~~ 0504-104-01			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Y Trizma, Z other (specify), Other:

Special Instructions/Note: Dissolved metals lab filtered

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2320B Alk/Bicarb, 2540C TDS, 300-Cl, NO3, NO2 & SO4	6020B Total As, Cd, Fe, Mn, Pb & Zn	6020B Diss As, Cd, Fe, Mn, Pb & Zn	6010D Total K, Mg & Na, 7470A Total Hg	6010D Dissolved Ca & Mg, 7470 Dissolved Hg	350.1 Ammonia	SM5310B TOC	B	8260D - Standard Analyte List PCE & 1,1-TCA	8270E Semivolatiles, Standard list 1,4-Dioxane	N	EPA 1633	Total Number of containers
			Preservation Code:				N	D	N	D	N	S	S		A	N	N	N	
MW-12A-032524	3.25.24	1306	G	Water			X	X	X	X	X	X	X		X	X			13
MW-15-032524	3.25.24	1140	G	Water														X	3
MW-2A-032624	3.26.24	1125	G	Water			X	X	X	X	X	X	X		X	X		X	10
MW-8B-032624	3.26.24	1235	G	Water														X	3
MW-9A-032624	3.26.24	1340	G	Water														X	3
MW-16-032624	3.26.24	1436	G	Water														X	3
MW-7B-032724	3.27.24	0925	G	Water			X	X	X	X	X	X	X		X	X		X	10
MW-5A-032724	3.27.24	1045	G	W			X	X	X	X	X	X	X		X	X		X	9
DUP-032724	3.27.24	1200	G	W			X	X	X	X	X	X	X		X	X		X	10
EB-032524	3.25.24	1106	G	W														X	3
TB-032624	3/26/24	x	G	W											X				1

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee m ☐ Return To Client — *than 1 month)* — *Months*

Deliverable Requested: I II III IV Other (specify)

Special Instructions/QC R

590-23966 Chain of Custody

Empty Kit Relinquished by:	Date:	Time:		
Relinquished by: Morea Schofield	Date/Time: 3.28.24 07:37	Company: GEI	Received by:	Company
Relinquished by:	Date/Time:	Company	Received by:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 8/28/24 8:37 Company: EFSPO

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.

Cooler Temperature(s) °C and Other Remarks: 5.9 aw + 0.5 ow + 2.3 aw IR Gun

Eurofins Spokane
11922 East 1st Ave
Spokane, WA 99206
Phone: 509-924-9200 Fax: 509-924-9290

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Arrington, Randee E	Carrier Tracking No(s):	COC No: 590-8933.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Randee.Arrington@et.eurofinsus.com	State of Origin: Washington	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Washington		Job #: 590-23966-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 4/10/2024			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: Marshall Landfill/0504-104-01	Project #: 59002669			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	350.1	SM5310B/ (MOD) TOC	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
MW-12A-032524 (590-23966-1)	3/25/24	13:06 Pacific		Water			X	X	2	
MW-2A-032524 (590-23966-3)	3/26/24	11:25 Pacific		Water			X	X	2	
MW-7B-032524 (590-23966-7)	3/27/24	09:25 Pacific		Water			X	X	2	
MW-5A-032524 (590-23966-8)	3/27/24	10:45 Pacific		Water			X	X	2	
DUP-032724 (590-23966-9)	3/27/24	12:00 Pacific		Water			X	X	2	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Northwest, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Northwest, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Northwest, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Northwest, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	3/29/24 15:30	ET SPO	[signature]	03/30/24 0935	EETDEN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		0.5, CF-1, IK-14

Ver: 06/08/2021

Eurofins Spokane
11922 East 1st Ave
Spokane, WA 99206
Phone: 509-924-9200 Fax: 509-924-9290

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Arrington, Randee E	Carrier Tracking No(s):	COC No: 590-8931.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Randee.Arrington@et.eurofinsus.com	State of Origin: Washington	Page: Page 1 of 1
Company: Eurofins Environment Testing Northwest,		Accreditations Required (See note): State Program - Washington		Job #: 590-23966-1
Address: 5755 8th Street East, ,	Due Date Requested: 4/10/2024			
City: Tacoma	TAT Requested (days):			
State, Zip: WA, 98424				
Phone: 253-922-2310(Tel)	PO #:			
Email:	WO #:			
Project Name: Marshall Landfill/0504-104-01	Project #: 59002669			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020B/3005A (MOD) Total As, Cd, Fe, Mn, Pb & Zn	6020B/FILTRATION (MOD) Diss As, Cd, Fe, Mn, Pb & Zn	8270C_SIM_MS_ID/3510C_LVI 1,4-Dioxane	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-12A-032524 (590-23966-1)	3/25/24	13:06 Pacific		Water			X	X	X	4	
MW-2A-032524 (590-23966-3)	3/26/24	11:25 Pacific		Water			X	X	X	4	
MW-7B-032524 (590-23966-7)	3/27/24	09:25 Pacific		Water			X	X	X	4	
MW-5A-032524 (590-23966-8)	3/27/24	10:45 Pacific		Water			X	X	X	4	
DUP-032724 (590-23966-9)	3/27/24	12:00 Pacific		Water			X	X	X	4	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Northwest, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Northwest, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Northwest, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Northwest, LLC.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		3/28/24 15:07	EET SO		3/29/24 0945	EETN
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: IR11 0.9/0.8

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-23966-1

Login Number: 23966
List Number: 1
Creator: Morris, Mackenzie 1

List Source: Eurofins Spokane

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

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-23966-1

Login Number: 23966
List Number: 4
Creator: Little, Matthew L

List Source: Eurofins Denver
List Creation: 03/30/24 11:39 AM

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

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-23966-1

Login Number: 23966
List Number: 3
Creator: Simmons, Jason C

List Source: Eurofins Sacramento
List Creation: 03/29/24 02:32 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	2261029
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.5c
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-23966-1

Login Number: 23966
List Number: 2
Creator: Harp, Cordelia

List Source: Eurofins Seattle
List Creation: 03/29/24 10:47 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	IR 11 0.9/0.8 c
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Isotope Dilution Summary

Client: GeoEngineers Inc
Job ID: 590-23966-1
Project/Site: Marshall Landfill/0504-104-01

Method: 8270C SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

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

		Percent Isotope Dilution Recovery (Acceptance Limits)
		DXE
Lab Sample ID	Client Sample ID	(40-140)
590-23966-1	MW-12A-032524	38 *5-
590-23966-3	MW-2A-032524	41
590-23966-7	MW-7B-032524	35 *5-
590-23966-8	MW-5A-032524	36 *5-
590-23966-9	DUP-032724	35 *5-
LCS 580-455296/2-A	Lab Control Sample	49
LCSD 580-455296/3-A	Lab Control Sample Dup	45
MB 580-455296/1-A	Method Blank	45

Surrogate Legend

DXE = 1,4-Dioxane-d8

Method: Draft-4 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)
590-23966-2	MW-15A-032524	69.1	78.0	84.4	77.2	73.7	73.7	70.2	60.6
590-23966-3	MW-2A-032524	69.4	84.3	82.8	76.2	77.2	70.6	60.4	59.2
590-23966-3 - RA	MW-2A-032524								
590-23966-4	MW-8A-032524	66.9	77.8	83.3	74.1	74.0	73.5	62.6	56.4
590-23966-5	MW-9A-032524	69.5	81.8	84.2	81.3	76.9	78.2	64.5	63.9
590-23966-6	MW-16A-032524	66.5	79.9	80.7	71.5	71.4	72.2	64.3	54.9
590-23966-7	MW-7B-032524	65.5	76.6	80.6	73.0	69.5	73.2	51.0	50.3
590-23966-8	MW-5A-032524	67.9	80.1	82.2	74.0	73.8	69.1	55.3	55.3
590-23966-9	DUP-032724	66.6	78.1	85.5	77.8	71.2	77.0	68.1	70.1
590-23966-10	FB-032524	66.1	73.4	78.9	73.7	68.7	68.0	61.8	59.5
LCS 320-752267/3-A	Lab Control Sample	69.7	82.5	88.3	79.0	74.3	76.7	65.5	68.1
LLCS 320-752267/2-A	Lab Control Sample	69.4	82.5	87.3	83.9	71.9	78.9	67.7	67.5
MB 320-752267/1-A	Method Blank	72.2	84.0	86.6	80.5	79.9	73.4	66.5	67.2

		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)
590-23966-2	MW-15A-032524	59.2	53.3	70.9	69.7	76.6	66.6	80.4	85.3
590-23966-3	MW-2A-032524	51.2	50.7	71.8	67.5	75.5	69.8	77.4	77.3
590-23966-3 - RA	MW-2A-032524								
590-23966-4	MW-8A-032524	51.3	51.3	70.0	63.4	72.5	66.7	71.1	72.3
590-23966-5	MW-9A-032524	54.2	51.6	74.5	68.9	77.6	69.6	74.8	77.9
590-23966-6	MW-16A-032524	50.0	49.2	71.5	64.6	74.8	66.5	66.7	73.9
590-23966-7	MW-7B-032524	46.4	48.7	69.4	65.9	72.4	64.5	70.9	71.3
590-23966-8	MW-5A-032524	47.3	47.6	73.2	67.6	74.2	68.6	69.4	71.9
590-23966-9	DUP-032724	58.5	59.7	68.9	66.7	76.6	69.0	74.7	75.2
590-23966-10	FB-032524	49.8	50.3	67.8	64.1	72.9	62.0	72.2	68.8
LCS 320-752267/3-A	Lab Control Sample	56.3	63.3	70.0	70.1	78.0	67.3	77.5	78.6
LLCS 320-752267/2-A	Lab Control Sample	57.1	60.9	71.0	67.9	78.3	62.9	71.2	80.8
MB 320-752267/1-A	Method Blank	60.5	57.4	74.2	70.3	84.8	70.3	76.6	80.9

Isotope Dilution Summary

Client: GeoEngineers Inc
Job ID: 590-23966-1
Project/Site: Marshall Landfill/0504-104-01

Method: Draft-4 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Matrix: Water
Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	M242FTS (40-200)	M262FTS (40-200)	M282FTS (40-300)	HFPODA (40-130)	NMFM (10-130)	NEFM (10-130)	d5NPFSA (10-130)	d3NMFSA (10-130)
590-23966-2	MW-15A-032524	88.6	77.5	79.7	83.8	63.2	67.4	73.1	68.2
590-23966-3	MW-2A-032524	85.6		98.3	85.2	63.7	67.8	70.5	65.0
590-23966-3 - RA	MW-2A-032524		76.9						
590-23966-4	MW-8A-032524	81.3	72.0	78.2	82.3	61.0	62.7	66.2	61.6
590-23966-5	MW-9A-032524	91.1	79.3	94.7	83.4	67.9	69.3	71.0	65.1
590-23966-6	MW-16A-032524	86.1	72.1	88.6	80.1	61.7	62.5	66.0	62.8
590-23966-7	MW-7B-032524	85.0	71.0	86.6	79.0	48.8	56.6	67.3	59.2
590-23966-8	MW-5A-032524	86.9	75.3	92.7	84.3	68.8	70.8	71.6	67.0
590-23966-9	DUP-032724	82.2	72.3	95.0	83.4	72.2	73.9	78.1	70.5
590-23966-10	FB-032524	80.4	74.1	83.8	82.8	63.2	64.3	69.2	59.5
LCS 320-752267/3-A	Lab Control Sample	70.7	65.4	78.7	87.3	72.1	75.5	69.0	64.8
LLCS 320-752267/2-A	Lab Control Sample	75.0	69.6	91.3	89.4	67.1	71.0	74.1	65.8
MB 320-752267/1-A	Method Blank	81.9	73.1	86.3	87.2	73.1	77.2	80.4	70.5

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
NMFM = d7-N-MeFOSE-M
NEFM = d9-N-EtFOSE-M
d5NPFSA = d5-NEtPFOSA
d3NMFSA = d3-NMePFOSA

Appendix C

Chemical Analytical Data Review

GeoEngineers

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Data Validation Report

Project:	Marshall Landfill Site March 2024 Samples
GEI File No:	00504-104-01
Date:	April 28, 2024

This report documents the results of a United States Environmental Protection Agency (USEPA)-defined Stage 2A data validation (USEPA Document 540-R-08-005; USEPA, 2009) of analytical data from the analyses of water samples collected as part of the March 2024 sampling event, and the associated laboratory and field quality control (QC) samples. The samples were obtained from the Marshall Landfill site located in Spokane County, Washington.

OBJECTIVE AND QUALITY CONTROL ELEMENTS

GeoEngineers, Inc. (GeoEngineers) completed the data validation consistent with the USEPA Contract Laboratory Program National Functional for Organic Superfund Methods Data Review (USEPA, 2020a) and Inorganic Superfund Methods Data Review (USEPA, 2020b) (National Functional Guidelines) to determine if the laboratory analytical results meet the project objectives and are usable for their intended purpose. Data usability was assessed by determining if:

- The samples were analyzed using well-defined and acceptable methods that provide reporting limits below applicable regulatory criteria;
- The precision and accuracy of the data are well-defined and sufficient to provide defensible data; and
- The quality assurance/quality control (QA/QC) procedures utilized by the laboratory meet acceptable industry practices and standards.

In accordance with the Quality Assurance Project Plan (QAPP), Appendix B of the Work Plan (GeoEngineers, 2023), the data validation included review of the following QC elements:

- Data Package Completeness
- Chain-of-Custody Documentation
- Holding Times and Sample Preservation
- Surrogate Recoveries
- Method, Trip, and Field Blanks
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples/Laboratory Control Sample Duplicates
- Laboratory and Field Duplicates

VALIDATED SAMPLE DELIVERY GROUPS

This data validation included review of the sample delivery group (SDG) listed below in Table 1.

TABLE 1. SUMMARY OF VALIDATED SAMPLE DELIVERY GROUPS

Laboratory SDG	Samples Validated
590-23966-1	MW-2A-032624, MW-5A-032724, DUP-032724, MW-7B-032724, MW-8A-032624, MW-9A-032624, MW-12A-032524, MW-15A-032524, MW-16A-032624, FB-032524, TB-2/26

CHEMICAL ANALYSIS PERFORMED

Eurofins Spokane, Environment Testing, LLC (Eurofins), located in Spokane, Washington, performed laboratory analyses on the samples using one or more of the following methods:

- Volatile Organic Compounds (VOCs) by Method EPA8260D;
- Semi-Volatile Organic Compounds (SVOCs) by Method EPA8270C-SIM;
- Total and Dissolved Metals by Methods SW6010D, SW6020B, or SW7470A;
- Anions by Method EPA300.0;
- Ammonia as N by Method EPA350.1;
- Total Alkalinity and Bicarbonate by Method SM2320B;
- Total Dissolved Solids (TDS) by Method SM2540C;
- Total Organic Carbon (TOC) by Method SM5310B; and
- Per- and Polyfluoroalkyl Substances (PFAS) by Method EPA1633

DATA VALIDATION SUMMARY

The results for each of the QC elements are summarized below.

Data Package Completeness

Eurofins provided the required deliverables for the data validation according to the National Functional Guidelines. The laboratory followed adequate corrective action processes and the identified anomalies were discussed in the relevant laboratory case narrative.

Chain-of-Custody Documentation

Chain-of-custody (COC) forms were provided with the laboratory analytical reports. The COCs were accurate and complete when submitted to the laboratory.

Holding Times and Sample Preservation

The sample holding time is defined as the time that elapses between sample collection and sample analysis. Maximum holding time criteria exist for each analysis to help ensure that the analyte concentrations found at the time of analysis reflect the concentration present at the time of sample collection. Established holding times were met for each analysis, with the exceptions noted below. The sample coolers arrived at the laboratory within the appropriate temperatures of between two and six degrees Celsius.

SDG 590-23966-1: (Anions) The 48-hour holding time for nitrate and nitrite analyses was exceeded in Samples MW-2A-032624 and MW-12A-032524. The positive results for nitrate and the reporting limits for nitrite were qualified as estimated (J and UJ, respectively) in these samples.

Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the organic analytes of interest, but unlikely to be found in an environmental sample. Surrogates are used for organic analyses and are added to the samples, standards, and blanks to serve as an accuracy and specificity check of each analysis. The surrogates are added to the samples at a known concentration and percent recoveries are calculated following analysis. The surrogate percent recoveries for field samples were within the laboratory control limits, with the following exceptions:

SDG 590-23966-1: (SVOCs) The percent recovery for surrogate 1,4-Dioxane-d8 was less than the control limits in Samples MW-5A-032724, DUP-032724, MW-7B-032724, and MW-12A-032524. The positive result for 1,4-Dioxane was qualified as estimated (J) in Sample MW-7B-032724. The reporting limits for 1,4-Dioxane were qualified as estimated (UJ) in Samples MW-5A-032724, DUP-032724, and MW-12A-032524.

Method, Trip, and Field Blanks

Method Blanks

Method blanks are analyzed to ensure that laboratory procedures and reagents do not introduce measurable concentrations of the analytes of interest. A method blank was analyzed with each batch of samples, at a frequency of 1 per 20 samples. For each sample batch, method blanks for the applicable methods were analyzed at the required frequency. None of the analytes of interest were detected in the method blanks, with the following exceptions:

SDG 590-23966-1: (SVOCs) There was a positive result for 1,4-Dioxane detected above the method detection limit, but below the reporting limit in the method blank extracted on 4/1/2024. The positive result for this target analyte was qualified as non-detected (U) in Sample MW-7B-032724.

(Total and Dissolved Metals) There was a positive result for total and dissolved mercury detected above the method detection limit, but below the reporting limit in the method blank digested on 4/11/2024. The positive results for these target analytes were qualified as non-detected (U) in Samples MW-2A-032624, MW-5A-032724, DUP-032724, MW-7B-032724, and MW-12A-032524.

(Alkalinity) There was a positive result for total and bicarbonate alkalinity detected above the method detection limit, but below the reporting limit in the method blank digested on 4/8/2024. The positive results for these target analytes were greater than 10X the concentration in the method blank in the associated field samples; therefore, no qualifications were required.

Trip Blanks

Trip blanks are analyzed to provide an indication as to whether volatile compounds have cross contaminated other like samples within the transportation process to the laboratory. None of the analytes of interest were detected the trip blank.

Field Blanks

Field blanks are analyzed to provide an indication as to whether there has been cross-contamination from field condition during sample collection. None of the analytes of interest were detected in the field blank.

Matrix Spikes/Matrix Spike Duplicates

Since the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis on one sample from the associated batch, known as the parent sample. One aliquot of the sample is analyzed in the normal manner and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a percent recovery is calculated. Matrix spike duplicate (MSD) analyses are generally performed for organic analyses as a precision check and analyzed in the same sequence as a matrix spike. Using the result values from the MS and MSD, the relative percent difference (RPD) is calculated. The percent recovery control limits for MS and MSD analyses are specified in the laboratory documents, as are the RPD control limits for MS/MSD sample sets.

One MS/MSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for each analysis and the percent recovery and RPD values were within the proper control limits.

Laboratory Control Samples/Laboratory Control Sample Duplicates

A laboratory control sample (LCS) is a blank sample that is spiked with a known amount of analyte and then analyzed. An LCS is similar to an MS, but without the possibility of matrix interference. Given that matrix interference is not an issue, the LCS/LCSD control limits for accuracy and precision are usually more rigorous than for MS/MSD analyses. Additionally, data qualification based on LCS/LCSD analyses would apply to all samples in the associated batch, instead of just the parent sample. The percent recovery control limits for LCS and LCSD analyses are specified in the laboratory documents, as are the RPD control limits for LCS/LCSD sample sets.

One LCS/LCSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for all analyses and the percent recovery and RPD values were within the proper control limits.

Laboratory Duplicates

Internal laboratory duplicate analyses are performed to monitor the precision of the analyses. Two separate aliquots of a sample are analyzed as distinct samples in the laboratory and the RPD between the two results is calculated. Duplicate analyses should be performed once per analytical batch. If one or more of the samples used has a concentration less than five times the reporting limit for that sample, the absolute difference is used instead of the RPD. The RPD control limits are specified in the laboratory documents. Laboratory duplicates were analyzed at the proper frequency and the specified acceptance criteria were met, with the following exception:

SDG 590-23966-1: (Dissolved Metals) The laboratory performed a laboratory duplicate sample set on Sample MW-12A-032524. The RPD for dissolved magnesium was greater than the control limit in the laboratory duplicate digested on 4/11/2024. The positive result for this target analyte was qualified as estimated (J) in Sample MW-12A-032524.

Field Duplicates

In order to assess precision, field duplicate samples were collected and analyzed along with the reviewed sample batches. The duplicate samples were analyzed for the same parameters as the associated parent samples. Precision is determined by calculating the RPD between each pair of samples. If one or more of the sample analytes has a concentration less than five times the reporting limit for that sample, then the absolute difference is used instead of the RPD. The RPD control limit for water samples is 35 percent.

SDG 590-23966-1: One field duplicate sample pair, MW-5A-032724 and DUP-032724, was submitted with this SDG. The precision criteria for the target analytes were met for this sample pair, with the exception of nitrite. The positive result and reporting limit for this target analyte was qualified as estimated (J and UJ, accordingly) in this sample pair.

OVERALL ASSESSMENT

As was determined by this data validation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the surrogate, LCS/LCSD, and MS/MSD percent recovery values, with the exceptions noted above. Precision was acceptable, as demonstrated by the LCS/LCSD, MS/MSD, and laboratory/field duplicate RPD values, with the exceptions noted above.

The data are acceptable for the intended use, with the following qualification listed below in Table 2.

TABLE 2. SUMMARY OF QUALIFIED SAMPLES

Sample ID	Analyte	Qualifier	Reason
MW-2A-032624	Total mercury	U	Method Blank Contamination
	Dissolved mercury	U	Method Blank Contamination
	Nitrate	J	Holding Time
	Nitrite	UJ	Holding Time
MW-5A-032724	1,4-Dioxane	UJ	Surrogate Recovery
	Total mercury	U	Method Blank Contamination
	Dissolved mercury	U	Method Blank Contamination
	Nitrite	UJ	Field Duplicate Precision
DUP-032724	1,4-Dioxane	UJ	Surrogate Recovery
	Total mercury	U	Method Blank Contamination
	Dissolved mercury	U	Method Blank Contamination
	Nitrite	J	Field Duplicate Precision
MW-7B-032724	1,4-Dioxane	UJ	Surrogate Recovery/Method Blank Contamination
	Total mercury	U	Method Blank Contamination
	Dissolved mercury	U	Method Blank Contamination
MW-12A-032524	1,4-Dioxane	UJ	Surrogate Recovery
	Dissolved magnesium	J	Laboratory Duplicate Precision
	Total mercury	U	Method Blank Contamination
	Dissolved mercury	U	Method Blank Contamination
	Nitrate	J	Holding Time
	Nitrite	UJ	Holding Time

REFERENCES

U.S. Environmental Protection Agency (USEPA). "Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use," EPA-540-R-08-005. January 2009.

U.S. Environmental Protection Agency (USEPA) 2020a. Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review, EPA-540-R-20-005. November 2020.

U.S. Environmental Protection Agency (USEPA) 2020b. Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Methods Data Review, EPA-542-R-20-006. November 2020.

GeoEngineers, Inc. "Work Plan, Marshall Landfill Groundwater Monitoring," prepared for Washington State Department of Ecology. November 17, 2023.

Appendix D

Report Limitations and Guidelines for Use

Appendix D

REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Environmental Services Are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the exclusive use of Herrera and Ecology, their authorized agents, and regulatory agencies. This report is not intended for use by others and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, an environmental site assessment study conducted for a property owner may not fulfill the needs of a prospective purchaser of the same property. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and project site. No one except Herrera and Ecology should rely on this environmental report without first conferring with GeoEngineers. This report should not be applied for any purpose or project except the one originally contemplated.

This Environmental Report is Based on a Unique Set of Project-Specific Factors

This report has been prepared for Herrera and Ecology. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

Reliance Conditions for Third Parties

Our report was prepared for the exclusive use of our Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and generally accepted environmental practices in this area at the time this report was prepared.

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[1] Developed based on material provided by GBA, GeoProfessional Business Association; www.geoprofessional.org.

Environmental Regulations are Always Evolving

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead, to contamination of the subject site, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substance, change or if more stringent environmental standards are developed in the future.

Subsurface Conditions Can Change

This environmental report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, by new releases of hazardous substances, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying this report to determine if it is still applicable.

Soil and Groundwater End Use

The cleanup levels referenced in this report are site-and situation-specific. The cleanup levels may not be applicable for other sites or for other on-site uses of the affected media (soil and/or groundwater). Note that hazardous substances may be present in some of the site soil and/or groundwater at detectable concentrations that are less than the referenced cleanup levels. GeoEngineers should be contacted prior to the export of soil or groundwater from the subject site or reuse of the affected media on site to evaluate the potential for associated environmental liabilities. We cannot be responsible for potential environmental liability arising out of the transfer of soil and/or groundwater from the subject site to another location or its reuse on site in instances that we were not aware of or could not control.

Most Environmental Findings are Professional Opinions

Our interpretations of subsurface conditions are based on field observations and chemical analytical data from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ – sometimes significantly – from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Do Not Redraw the Exploration Logs

Environmental scientists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in an environmental report should never be redrawn for inclusion in other design drawings. Only photographic or electronic reproduction is acceptable but recognizes that separating logs from the report can elevate risk.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering, geology and environmental science) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory “limitations”

provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical, Geologic and Geoenvironmental Reports Should Not be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants and no conclusions or inferences should be drawn regarding Biological Pollutants, as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

If Client desires these specialized services, they should be obtained from a consultant who offers services in this specialized field.