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SENT VIA EMAIL

January 12, 2024
Parametrix No. 553-1550-067

Ryan Gardiner, Project Manager
Washington State Department of Ecology
Toxics Cleanup Program
15700 Dayton Ave. N.
Shoreline, Washington 98133

Re: South Park Landfill Fourth Quarter 2023 Progress Report

Dear Ryan:

This letter report provides an explanation of actions taken during the referenced period.

General Activities During the 2023 Fourth Quarter

SRDS Property

- The old South Transfer Station seep area (compactor shed) is fenced off and locked and all safeguards are still in place.
- Solid Waste Operations and Household Hazardous Waste Collection continues on the Seattle Public Utilities (SPU) old South Transfer Station property.
- SPU requested access to the CenterPoint property to facilitate brush clearing and a property boundary survey for the STS Phase 2 project.
- SPU is coordinating with Seattle Department of Transportation on repairs to the landfill cap located in the right-of-way.
- SPU will retain Hot Mix Pavers to perform sealing of cracks on the asphalt within the SRDS property.

CenterPoint South Park LLC Property (former SPPD owned property)

- Cap maintenance activities completed by CenterPoint South Park LLC (CenterPoint) included:
    - Blackberry bushes were cut back
    - Removal of invasive plant growth at location AC-23
    - Storm drains were inspected and drained at locations SW-3 and SW-4
    - Tenant (First Student) was notified to make repairs at locations AC-3 and AC-6
- Ongoing remote monitoring of the landfill gas system blowers. The current tenants First Student and Amazon vehicle parking are active on CenterPoint property.
- Conducted quarterly inspection of the methane alarms in the on-site buildings.
- Conducted quarterly operation and maintenance of the landfill gas system.

Overall Settlement Parcels

- The 2023 fourth quarter compliance monitoring was completed. SPU staff conducted the gas monitoring and the Parametrix team conducted the groundwater monitoring.
- Parametrix reviewed field measurements and completed data management for the 2023 fourth quarter compliance monitoring events.
- Parametrix reviewed Ecology comments and finalized the work plan to replace the shallow perimeter compliance gas probes that are consistently blocked with water. The work plan was finalized and submitted to Ecology in December. Ecology reviewed and approved the Supplemental Probes Work Plan on December 27, 2023.
- The mid-year cap inspection was conducted by Parametrix in October. A report was prepared and reviewed by the property owners.

Deviations from Samples, Required Tasks, CAP, or Schedule

Methane at gas probe GP-13 was recorded at 4.2% by volume during the fourth quarter monitoring event conducted on October 31, 2023. The Cleanup Action Plan Landfill Gas Monitoring and Contingency Plan (Figure A.2.4) has a contingent action trigger for measurements below 5% and above 1.25%. GP-13 is a shallow probe blocked with water and therefore the recorded measurement is not representative of concentration in the screen zone. A work plan was approved by Ecology in December for installation of supplemental gas probes at probes that are consistently blocked with water.

Data Summary

The perimeter gas probes were monitored by SPU on October 31, 2023. The results are recorded in the attached gas probe report. All concentrations were less than the 5 percent by volume regulatory action limit. Methane was detected at the following probes:

Probe	CH4 (% by volume)	Blocked	Comments
GP-13	4.2%	Yes	Refer to deviations section above
GP-27	0.1%	No	Below trigger values
GP-29	0.3%	No	Below trigger values

The groundwater wells were monitored by the Parametrix team between November 6 and 8, 2023. The monitoring samples were analyzed by Analytical Resources, Incorporated. Data validation is complete and a concentration trigger assessment for vinyl chloride was performed. A draft data summary table and updated time-series plots, and the final lab reports for the 2023 fourth quarter are included as attachments to this progress report.

Data management is complete for the 2023 fourth quarter compliance monitoring event.

Upcoming Activities

SRDS Property

- SPU has contracted a new design team and design is proceeding from the 60% to 90% design phase. The final design will be completed in early 2024.

CenterPoint Property

- Ongoing remote monitoring of the CenterPoint property landfill gas system blowers.
- Complete the first quarter 2024 operation and maintenance of the landfill gas system.

Overall Settlement Parcels

- Complete the first quarter 2024 compliance monitoring.
- Work with a drilling subcontractor to install supplemental gas probes as described in the approved Supplemental Gas Probes Work Plan and repair damaged probe GP-28.
- Finalize the October 11, 2023, cap reinspection report and submit to Ecology.
- Complete the 2024 annual landfill cap inspection.
- Prepare the 2023 Operations, Maintenance, and Monitoring Annual Report.

If you have any questions regarding this progress report, please do not hesitate to contact me.

Sincerely,

PARAMETRIX

Laura B. Lee
Project Manager

cc: Mark Jusayan, SPU Solid Waste Capital Planning and Landfill Closure Program Manager
Min Soon Yim, SPU Landfill Manager
Ashley Piatek, CenterPoint Properties
Jeff Fowler, SPU, Solid Waste Line of Business Deputy Director
Susan Fife-Ferris, SPU, Solid Waste Line of Business/Solid Waste Planning Director
Megan J Joplin, SPU, Law Department, Attorney
Hui Yang, SPU, SRDS Redevelopment Project Manager
Anthony Grant, SPU Solid Waste Transfer Station Manager
Lucie Harpster, SPU Solid Waste Transfer Station Manager

Attachments

1 – LFG and Groundwater Compliance Monitoring Field Sheets, Fourth Quarter 2023

2 – Draft Groundwater Quality Data Summary, Fourth Quarter 2023

3 – Draft Groundwater Quality Time Series Plots through Fourth Quarter 2023

4 – Fourth Quarter 2023 Groundwater Laboratory Data

Attachment 1

LFG and Groundwater Compliance
Monitoring Field Sheets
Fourth Quarter 2023

Final Probe Report for South Park Landfill

Probe	Date	Technician	CH4 PPM	O2 %	CO2 %	SP In/Wc	Blocked	BPS	Comment
GP03	10/31/2023	TS	0	17.4	5.1	0.0	N	30.23	
GP07	10/31/2023	TS	0	17.5	3.5	0.1	N	30.23	
GP09	10/31/2023	TS	0	15.4	6.7	0.2	N	30.23	
GP11	10/31/2023	TS	0	21.1	1.3	0.1	N	30.23	
GP13	10/31/2023	TS	42000	0.2	3.4	-28.7	Y	30.23	
GP15	10/31/2023	TS	0	18.8	4.5	-1.9	N	30.23	
GP16	10/31/2023	TS	0	6.8	11.8	0.0	N	30.23	
GP23	10/31/2023	TS	0	14.3	7.8	0.0	N	30.23	
GP26	10/31/2023	TS	0	17.8	3.2	0.0	N	30.23	
GP27	10/31/2023	TS	1000	0.0	14.0	0.0	N	30.23	
GP28	10/31/2023	TS	0	22.1	0.1	0.1	N	30.23	
GP29	10/31/2023	TS	3000	0.0	15.4	0.0	N	30.23	
GP31	10/31/2023	TS	0	7.6	9.9	0.0	N	30.23	
GP32	10/31/2023	TS	0	13.4	3.6	-4.4	Y	30.23	
GP33	10/31/2023	TS	0	17.5	2.7	0.0	N	30.23	
GP37	10/31/2023	TS	0	5.6	10.4	0.0	N	30.23	
GP38	10/31/2023	TS	0	2.5	15.7	0.0	N	30.23	

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Form 07-EN-215/Rev. 02/07

Water Level Measurement Field Report

DATE	JOB NO. 553-1550-067			
PROJECT: South Park Landfill	CLIENT: Seattle Public Utilities			
LOCATION: Seattle, WA				
WEATHER overcast - slight drizzle	TEMP 49° F	° at	0821	AM
		° at		PM
PRESENT AT SITE				

THE FOLLOWING WAS NOTED:

WELL NUMBER	Time	Measured Depth to Water (ft from TOC or SG level)	Total Measured Well Depth (ft from TOC)	Measuring Point	Total Well Depth (ft bgs)	Screen Interval (ft bgs)	SU (ft)
MW-12	916	4.58		TOC	15.3	10-15	1.52
MW-14	920	2.33		TOC	21.8	11.5-21.5	0.8
MW-29	934	8.52		TOC	30	20-30	-0.29
MW-18	901	15.09		TOC	40.4	30-40	1.25
MW-25	910	13.41		TOC	27	22-27	2.79
MW-32	955	10.41		TOC	24	19-24	-0.44
MW-33	948	10.59		TOC	25	20-25	-0.47
MW-26	838	9.30		TOC	25	15-25	2.39
MW-27	847	8.11		TOC	20	10-20	2.04
MW-10	907	12.63		TOC	45	35-45	1.65
MW-24	823	8.55		TOC	45.3	35-45	1.56
MW-08	849	8.15		TOC	45.6	35.5 – 45.5	1.88
MW-30	0822	10.06		TOC	13	8-13	-0.53
MW-31	0821	10.50		TOC	23	35.5-45.5	-0.46

Comments:

TOC – top of PVC casing SG – staff gauge

SIGNED: _____ _____

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 11/7/23 Well ID: MW-08

Sampling Organization: Parametrix Samplers: C. Bourgeois & R. Anderson

Purge Data Screened Interval (ft bgs): 35.0-45.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 8.25' Purge Water Disposal Method: O/WS

Purge Device: peristaltic Pump Intake Depth: 40.0 ft

Begin Purge Time: 1440 End Purge Time: 1455

Time	Depth to Water (feet below MP)	Pump Setting (TSI)	Purge Rate (ml/min)	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1440	8.25	20	225	"	12.8	0.28	0.67	6.79	-108.8	8.40	Clear (mostly
1445	8.25	"	"	"	12.9	0.26	0.65	6.77	-109.3	4.72	clear (mostly
1450	8.25	"	"	"	12.9	0.23	0.66	6.76	-109.4	3.70	clear (mostly)
1455	8.25	"	"	"	12.9	0.21	0.67	6.76	-109.6	2.56	clear (mostly
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW08-1123 Time Collected: 1500 Weather: Overcast; 50's F

Sample Description (Color, Turbidity, Odor, Other):

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☑ No If yes, ID:

MS/MSD Collected: ☐ Yes ☑ No

Additional Information/Comments

Had issues with discharge line fittings at well head Cal tests

South Park Landfill

GROUNDWATER SAMPLE COLLECTION FORM

11/6/2023

Project No.: 553-1550-067 Date: ~~10~~/6/23 Well ID: MW-10

Sampling Organization: Parametrix Samplers: C. Bourgeois & R. Anderson

Purge Data Screened Interval (ft bgs): 35.0-44.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 12.70 Purge Water Disposal Method: O/WS

Purge Device: peristaltic Pump Intake Depth: 40.0 ft

Begin Purge Time: 12:45 End Purge Time: 1:06

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate (mL/min)	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1245	12.69	2.5	248 mL/min		14.1	0.83	1.13	6.68	-119.2	12.1	clear
1250	12.69	2.5	248 mL/min		14.1	0.52	1.13	6.70	-124.7	5.18	clear
1255	12.69	2.5	248		14.1	0.40	1.14	6.74	-131.2	3.00	clear
1300	12.69	2.5	248		14.0	0.35	1.15	6.75	-134.3	2.80	clear
1305	12.69	2.5	248	6 L	14.1	0.31	1.15	6.76	-135.3	1.51	clear
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW10-1123 Time Collected: ~~1306~~ 1310 Weather: Raining ≈ 45° F

Sample Description (Color, Turbidity, Odor, Other): Yellow tinge

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☑ Yes ☐ No If yes, ID: SPL-GW-MW60-1123 @ 1350

MS/MSD Collected: ☑ Yes ☐ No

Additional Information/Comments

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 | Date: 11/8/23 | Well ID: MW-12

Sampling Organization: Parametrix | Samplers: C. Bourgeois & R. Anderson

Purge Data | Screened Interval (ft bgs): 10.0-15.0 | Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): ~~[illegible]~~ 4.81 | Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump | Pump Intake Depth: 12.5 ft

Begin Purge Time: 815 | End Purge Time: 900

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate (mL/min)	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
820	4.81	20'	250	"	14.2	3.25	0.301	6.51	97.1	24.8	clear (mostly)
825	4.81	"	"	"	14.4	1.88	0.277	6.42	91.1	4.08	clear (mostly)
830	4.82	"	"	"	14.4	1.39	0.271	6.38	77.2	2.25	clear (mostly)
835	4.82	"	"	"	14.5	1.13	0.272	6.35	68.5	1.55	clear (mostly)
840	4.82	"	"	"	14.5	1.02	0.273	6.33	64.1	1.73	clear (mostly)
845	4.82	"	"	"	14.5	0.93	0.274	6.33	60.2	1.20	clear (mostly)
850	4.82	"	"	"	14.6	0.88	0.276	6.33	55.7	1.21	clear (mostly)
855	4.82	"	"	"	14.4	0.83	0.277	6.33	52.4	1.21	clear (mostly)
900	4.82	"	"	"	14.6	0.81	0.278	6.33	48.9	1.06	clear (mostly)
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW12-1123 | Time Collected: 905 | Weather: Sunny; 50's F

Sample Description (Color, Turbidity, Odor, Other): Clear

Sample Analyses: cis-1,3-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☑ No | If yes, ID:

MS/MSD Collected: ☐ Yes ☑ No

Additional Information/Comments

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 11/8/23 Well ID: MW-14

Sampling Organization: Parametrix Samplers: C. Bourgeois & R. Anderson

Purge Data Screened Interval (ft bgs): 11.5-21.5 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): * N/A - see comment Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump Pump Intake Depth: 16.5 ft

Begin Purge Time: 1300 End Purge Time: 1345

Time	Depth to Water (feet below MP)	Pump Setting	mL/min Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (mS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1305	N/A	20'	245	"	15.5	0.37	0.449	6.73	-41.3	10.2	clear (mostly)
1310	N/A	"	"	"	15.6	0.27	0.447	6.71	-42.4	12.9	clear (mostly)
1315	N/A	"	"	"	15.6	0.22	0.447	6.71	-44.2	11.8	clear (mostly)
1320	N/A	"	"	"	15.6	0.18	0.446	6.71	-45.6	13.0	clear (mostly)
1325	N/A	"	"	"	15.7	0.20	0.447	6.71	-47.3	9.45	clear (mostly)
1330	N/A	"	"	"	15.7	0.17	0.447	6.71	-48.7	6.05	clear (mostly)
1335	N/A	"	"	"	15.7	0.17	0.447	6.71	-49.9	4.41	clear (mostly)
1340	N/A	"	"	"	15.7	0.17	0.447	6.71	-50.6	3.90	clear (mostly)
1345	N/A	"	"	"	15.7	0.16	0.446	6.71	-51.4	3.95	clear (mostly)
			Stabilization Criteria		3%	10%, or 3<0.5	3%	±0.1	±10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW14-1123 Time Collected: 1350 Weather: Sunny; 50's F

Sample Description (Color, Turbidity, Odor, Other): clear

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☑ No If yes, ID:

MS/MSD Collected: ☐ Yes ☑ No

Additional Information/Comments

* DTW not measured because WL meter inoperable.

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GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 11/8/2023 Well ID: MW-18

Sampling Organization: Parametrix Samplers: C. Bourgeois & R. Anderson

Purge Data Screened Interval (ft bgs): 30.0-40.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 15.33 Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump Pump Intake Depth: 35.0 ft

Begin Purge Time: 1100 End Purge Time: 1125

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate (ml/min)	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1100	15.33	50'	250	"	14.7	1.68	0.51	6.85	-50.5	1.91	clear (mostly)
1105	15.33	"	"	"	14.7	0.88	0.50	6.83	-63.9	2.21	clear (mostly)
1110	15.33	"	"	"	14.7	0.51	0.50	6.82	-71.6	2.05	clear (mostly)
1115	15.33	"	"	"	14.7	0.40	0.50	6.80	-75.7	2.04	clear (mostly)
1120	15.33	"	"	"	14.8	0.34	0.50	6.79	-78.6	1.29	clear (mostly)
1125	15.33	"	"	"	14.7	0.30	0.50	6.78	-80.9	1.40	clear (mostly)
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW18-1123 Time Collected: 1130 Weather: Sunny; 50's F

Sample Description (Color, Turbidity, Odor, Other): clear

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☑ No If yes, ID:

MS/MSD Collected: ☐ Yes ☑ No

Additional Information/Comments

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 11/7/22 Well ID: MW-24

Sampling Organization: Parametrix Samplers: C. Bourgeois & R. Anderson

Purge Data Screened Interval (ft bgs): 35.0-45.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 8.78 Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump Pump Intake Depth: 40.0 ft

Begin Purge Time: 1100 End Purge Time: 1115

Time	Depth to Water (feet below MP)	Pump Setting (PSI)	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1100	8.78	60	250	"	12.1	0.65	0.74	6.53	-59.6	6.08	clear
1105	8.78	60	250	"	12.1	0.44	0.75	6.53	-69.0	2.27	clear
1110	8.78	"	"	"	12.1	0.32	0.75	6.53	-74.6	4.68	clear
1115	8.78	"	"	"	12.1	0.20	0.75	6.54	-78.1	1.18	clear
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW24-1123 Time Collected: 1120 Weather: Overcast; 50's F

Sample Description (Color, Turbidity, Odor, Other): clear

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☑ No If yes, ID:

MS/MSD Collected: ☐ Yes ☑ No

Additional Information/Comments

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 11/6/2023 Well ID: MW-25

Sampling Organization: Parametrix Samplers: C. Bourgeois & R. Anderson

Purge Data Screened Interval (ft bgs): 22.0-27.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 13.43 Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump Pump Intake Depth: 24.5 ft

Begin Purge Time: 1400 End Purge Time: 1420

Time	Depth to Water (feet below MP)	Pump Setting (PSI)	Purge Rate (ml/min)	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1400	13.43	18	500		14.0	1.41	0.94	6.59	-88.8	5.31	clear
1405	13.43		300		13.9	0.62	0.94	6.61	-100.5	4.01	clear
1410	13.43		300		14.0	0.44	0.95	6.61	-104.2	3.32	clear
1415	13.43		300		14.0	0.33	0.95	6.61	-108.1	2.81	clear
1420	13.43		300		14.0	0.21	0.96	6.61	-110.8	1.88	clear
				Stabilization Criteria	3%	10%	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW25-1123 Time Collected: 1430 Weather: Rainy ≈ 45°F

Sample Description (Color, Turbidity, Odor, Other): clear

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☑ No If yes, ID:

MS/MSD Collected: ☐ Yes ☑ No

Additional Information/Comments

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 11/7/2023 Well ID: MW-26

Sampling Organization: Parametrix Samplers: C. Bourgeois & R. Anderson

Purge Data Screened Interval (ft bgs): 15.0-25.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 9.48 * Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump Pump Intake Depth: 20.0 ft

Begin Purge Time: 1150 End Purge Time: 12:25

Time	Depth to Water (feet below MP)	Pump Setting (PSI)	Purge Rate (ml/min)	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1150	9.50	35	250	"	12.2	2.10	0.300	6.13	29.7	13.8	clear (mostly)
1155	9.50	"	"	"	12.2	1.04	0.309	6.08	30.5	16.8	clear (mostly)
1200	9.50	"	"	"	12.2	0.71	0.311	6.05	29.8	12.3	clear (mostly)
1205	9.50	"	"	"	12.1	0.49	0.312	6.04	27.9	9.67	clear (mostly)
1210	9.50	"	"	"	12.1	0.41	0.314	6.03	26.7	6.76	clear (mostly)
1215	9.50	"	"	"	12.1	0.34	0.315	6.03	25.0	3.93	clear (mostly)
1220	9.50	"	"	"	12.0	0.30	0.314	6.03	23.7	3.54	clear (mostly)
1225	9.50	"	"	"	12.0	0.28	0.314	6.02	15.5	2.90	clear (mostly)
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW26-1123 Time Collected: 12:30 Weather: overcast, 50's F

Sample Description (Color, Turbidity, Odor, Other): clear.

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☑ No If yes, ID:

MS/MSD Collected: ☐ Yes ☑ No

Additional Information/Comments

* initial depth of TOC measured 3 mins after pump

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 11/7/23 Well ID: MW-27

Sampling Organization: Parametrix Samplers: C. Bourgeois & R. Anderson

Purge Data Screened Interval (ft bgs): 10.0-20.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 8.22 Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump Pump Intake Depth: 15.0 ft

Begin Purge Time: 1250 End Purge Time: 1325

Time	Depth to Water (feet below MP)	Pump Setting (PSI)	Purge Rate (mL/min)	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1255	8.22	30'	225	"	13.4	3.66	0.321	6.51	14.2	16.7	clear (mostly
1300	8.22	"	"	"	13.4	1.60	0.320	6.57	-1.1	12.1	clear (mostly)
1305	8.22	"	"	"	13.4	0.92	0.317	6.53	-3.0	10.7	clear (mostly
1310	8.22	"	"	"	13.4	0.60	0.315	6.50	-3.3	10.5	clear (mostly
1315	8.22	"	"	"	13.3	0.49	0.315	6.49	-5.0	10.4	clear (mostly)
1320	8.22	"	"	"	13.3	0.36	0.315	6.47	-8.2	10.2	clear (mostly
1325	8.22	"	"	"	13.3	0.32	0.316	6.47	-11.1	10.0	clear (mostly)
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW27-1123 Time Collected: 1330 Weather: overcast, minor drizzle

Sample Description (Color, Turbidity, Odor, Other):

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☑ Yes ☐ No If yes, ID: SPL-GW-MW61-1123 @ 1410

MS/MSD Collected: ☑ Yes ☐ No

Additional Information/Comments

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 11/8/2023 Well ID: MW-29

Sampling Organization: Parametrix Samplers: C. Bourgeois & R. Anderson

Purge Data Screened Interval (ft bgs): 20.0-30.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 7.03 Purge Water Disposal Method: O/WS

Purge Device: peristaltic pump Pump Intake Depth: 25.0 ft

Begin Purge Time: 950 End Purge Time: 1015

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate (mL/min)	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
950	N/A	2.5	275	"	14.5	1.07	0.420	6.70	-5.0	3.90	clear (mostly)
955	N/A	"	"	"	12.9	0.63	0.428	6.75	-77.4	2.40	clear (mostly)
1000	"	"	"	"	12.8	0.40	0.437	6.76	-92.9	0.81	clear (mostly)
1005	"	"	"	"	12.8	0.39	0.444	6.78	-100.4	0.62	clear (mostly)
1010	"	"	"	"	12.8	0.28	0.451	6.80	-105.4	0.77	clear (mostly)
1015	"	"	"	"	12.7	0.25	0.452	6.81	-107.9	0.78	clear (mostly)

Stabilization Criteria Temp: 3% DO: 10%, or 3<0.5 Specific Conductivity: 3% pH: ± 0.1 ORP: ± 10 mv Turbidity: 10% or 3 <5 NTU

Sampling Data

Sample ID: SPL-GW_MW29-1123 Time Collected: 1020 Weather: Sunny, 50's F

Sample Description (Color, Turbidity, Odor, Other):

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☑ No If yes, ID:

MS/MSD Collected: ☐ Yes ☑ No

Additional Information/Comments Tubing required weight of water level indicator to submerge - cannot record changes

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 11/7/23 Well ID: MW-30

Sampling Organization: Parametrix Samplers: C. Bourgeois & R. Anderson

Purge Data Screened Interval (ft bgs): 8.0-13.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 10.02 Purge Water Disposal Method: O/WS

Purge Device: peristaltic pump Pump Intake Depth: 10.5 ft

Begin Purge Time: 927 End Purge Time: 1020

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate (ml/min)	Cum. Vol. Purged (litres)	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
930	10.18	2.5	240		14.9	0.30	0.55	6.35	-28.3	7.94	orange + fibrous
935	10.18	"	"		14.9	0.28	0.54	6.35	-26.8	4.94	turbidity
940	10.18	"	"		14.9	0.76	0.52	6.35	-24.0	4.12	less turbid
945	10.18	"	"		14.9	0.51	0.486	6.34	-21.7	2.17	"
950	10.18	"	"		14.9	0.61	0.459	6.35	-18.4	2.48	clear (mostly)
955 ~~1000~~	10.18	"	"		14.9	0.63	0.451	6.32	-15.8	1.05	"
1000	10.18	"	"		14.9	0.69	0.440	6.32	-14.0	0.76	"
1005	10.18	"	"		15.0	0.75	0.437	6.30	-11.8	0.97	"
1010	10.18	"	"		15.0	0.82	0.430	6.30	-9.8	1.97	"
1015	10.18	"	"		15.0	0.85	0.430	6.30	-8.4	1.41	"
1020	10.18	"	"		15.0	0.89	0.428	6.30	-6.6	1.49	"
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW30-1123 Time Collected: 10:25 Weather: overcast 50's

Sample Description (Color, Turbidity, Odor, Other): slight odor

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☑ No If yes, ID:

MS/MSD Collected: ☐ Yes ☑ No

Additional Information/Comments

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 11/7/23 Well ID: MW-31

Sampling Organization: Parametrix Samplers: C. Bourgeois & R. Anderson

Purge Data Screened Interval (ft bgs): 18.0-23.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 10.73 Purge Water Disposal Method: O/WS

Purge Device ~~peristaltic pump~~ bladder Pump Intake Depth: 20.5ft

Begin Purge Time: 820 End Purge Time: 915

Time	Depth to Water (feet below MP)	Pump Setting (PSI)	Purge Rate (ml/min)	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
825	10.73	30	300		14.1	1.17	0.408	6.56	-55.1	35.1	slightly dirty
830	10.73	30	300		14.2	0.60	0.416	6.53	-62.7	21.0	slightly dirty
835	10.73	30	300		14.2	0.44	0.419	6.49	-66.1	15.6	clear (mostly
840	10.73	30	300		14.2	0.34	0.419	6.47	-67.8	13.4	clear (mostly
845	10.73	30	300		14.3	0.30	0.421	6.46	-69.7	10.9	clear (mostly
850	10.73	30	300		14.2	0.27	0.421	6.46	-71.2	9.60	clear (mostly
855	10.73	30	300		14.3	0.27	0.421	6.46	-72.8	8.01	clear (mostly
900	10.73	30	300		14.3	0.26	0.422	6.46	-73.5	6.92	clear (mostly)
905	10.73	30	300		14.3	0.26	0.422	6.45	-74.5	6.30	clear (mostly)
910	10.73	30	300		14.3	0.23	0.422	6.44	-75.2	5.89	clear (mostly)
915	10.73	30	300	3.5 gal	14.3	0.22	0.422	6.44	-76.1	5.81	clear (mostly)
				Stabilization Criteria	3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW31-1123 Time Collected: 920 Weather: overcast ≈ 47°F

Sample Description (Color, Turbidity, Odor, Other): visible flecks

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☑ No If yes, ID:

MS/MSD Collected: ☐ Yes ☑ No

Additional Information/Comments

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 11/6/23 Well ID: MW-32

Sampling Organization: Parametrix Samplers: C. Bourgeois & R. Anderson

Purge Data Screened Interval (ft bgs): 19.0-24.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 10.41 Purge Water Disposal Method: O/WS

Purge Device: peristaltic pump Pump Intake Depth: 21.5 ft

Begin Purge Time: 1013 End Purge Time: 1040

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate (mL/min)	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1015	10.41	2.5	250	~0	13.9	1.90	0.62	6.76	-102.6	2.15	clear
1020	10.45				13.9	0.24	0.67	6.79	-121.5	1.38	clear
1025	10.45				13.9	0.53	0.66	6.82	-125.7	1.58	clear
1030	10.45				13.8	0.42	0.65	6.81	-125.3	3.93	clear
1035	10.51				13.9	0.36	0.62	6.81	-121.7	1.80	clear
1040	10.50				13.8	0.31	0.62	6.80	-121.9	1.16	clear
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW32-1123 Time Collected: 10:45 Weather: drizzle, 50's

Sample Description (Color, Turbidity, Odor, Other): clear w/ red flecks

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☑ No If yes, ID:

MS/MSD Collected: ☐ Yes ☑ No

Additional Information/Comments

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 11/6/23 Well ID: MW-33

Sampling Organization: Parametrix Samplers: C. Bourgeois & R. Anderson

Purge Data Screened Interval (ft bgs): 20.0-25.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 10.60 Purge Water Disposal Method: O/WS

Purge Device: peristaltic pump Pump Intake Depth: 22.5ft @ 16'

Begin Purge Time: 11:30 End Purge Time: 1155

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1135		2.5	245 mL/m		15.1	6.23	0.171	6.95	97.7	2.68	clear
1140		↓	↓		15.0	0.87	0.55	6.93	75.4	1.65	clear
1145		↓	↓		15.1	0.44	1.04	6.76	-110.2	0.88	clear
1150		↓	↓		15.1	0.33	1.06	6.74	-113.4	1.01	clear
1155		↓	↓	2.5 gal.	15.1	0.30	1.07	6.74	-116.9	1.23	clear
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW33-1123 Time Collected: 12:00 pm Weather: windy, drizzle

Sample Description (Color, Turbidity, Odor, Other): pale yellow hue

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☑ No If yes, ID:

MS/MSD Collected: ☐ Yes ☑ No

Additional Information/Comments

Used sounder to advance tubing

Attachment 2

Draft Groundwater Quality Data Summary
Fourth Quarter 2023

Groundwater Quality Data Summary, Fourth Quarter 2023, South Park Landfill

			Upgradient Wells			Downgradient Wells												Trip Blanks	
			A-Zone			Perched Zone	A-Zone						B-Zone						
Parameter	Units	Cleanup Level	MW-12 11/8/23	MW-14 11/8/23	MW-29 11/8/23	MW-30 [1] 11/7/23	MW-25 11/6/23	MW-26 11/7/23	MW-27 11/7/23	MW-61 (MW-27 Dup) 11/7/23	MW-31 [1] 11/7/23	MW-32 [2] 11/6/23	MW-33 [2] 11/6/23	MW-08 11/7/23	MW-10 11/6/23	MW-60 (MW-10 Dup) 11/6/23	MW-18 [2] 11/8/23	MW-24 11/7/23	MW-80 11/6/23	MW-81 11/8/23
Field Parameters																				
Temperature	C		14.6	15.7	12.7	15.0	14.0	12.0	13.3	--	14.3	13.8	15.1	12.9	14.1	--	14.7	12.1	--	--
Dissolved Oxygen	mg/L		0.81	0.16	0.25	0.89	0.21	0.28	0.32	--	0.22	0.31	0.30	0.21	0.31	--	0.30	0.28	--	--
Specific Conductivity	µS/cm		0.278	0.448	0.452	0.425	0.96	0.314	0.316	--	0.422	0.62	1.07	0.67	1.15	--	0.50	0.75	--	--
pH	units		6.33	6.71	6.81	6.30	6.61	6.02	6.47	--	6.44	6.80	6.74	6.76	6.76	--	6.78	6.54	--	--
Redox	mv		48.9	-51.4	-107.9	-6.6	-110.8	15.5	-111	--	-76.1	-121.9	-116.9	-109.6	-135.3	--	-80.9	-78.1	--	--
Turbidity	NTU		1.06	3.35	0.78	1.49	1.88	2.90	10.0	--	5.81	1.16	1.23	2.56	1.51	--	1.40	1.18	--	--
Metals																				
Iron, Total	mg/L	27 A-Zone	1.41	3.94	17.3	3.52	**34.9**	12.3	10.4	10.5	21.3	14.7	15.2	--	--	--	--	--	--	--
		31 B-Zone	--	--	--	--	--	--	--	--	--	--	--	14.3	**43.9**	**44.5**	12.1	28.6	--	--
Manganese, Total	mg/L	2.2	0.132	0.865	0.441	0.112	**2.78**	0.145	0.393	0.397	0.890	1.32	1.74	0.802	**2.51**	**2.63**	0.943	1.78	--	--
Volatile Organic Compounds																				
Vinyl Chloride	µg/L	0.29	0.0200 U	0.0200 U	0.0312	0.0710	0.285	0.0240	0.0200 U	0.0200 U	0.435 [1]	0.275	0.104	0.0520	0.0877	0.0850	0.0222	0.0559	0.0200 U	0.0200 U
Cis-1,2-Dichloroethene	µg/L	16	0.24	0.20 U	0.20 U	0.29	0.23	0.20 U	0.20 U	0.20 U	0.20 U	0.53	0.20 U	0.20 U	0.76	0.75	0.20 U	0.20 U	0.20 U	0.20 U

Notes:

[1] MW-30 and MW-31 monitor the former Glitsa property and are not CPOC wells.

[2] MW-18 is completed in refuse along the downgradient edge of the Landfill; MW-32 and MW-33 are completed beneath refuse along the downgradient edge.

= Exceeds cleanup level for CPOC wells

-- = Not analyzed

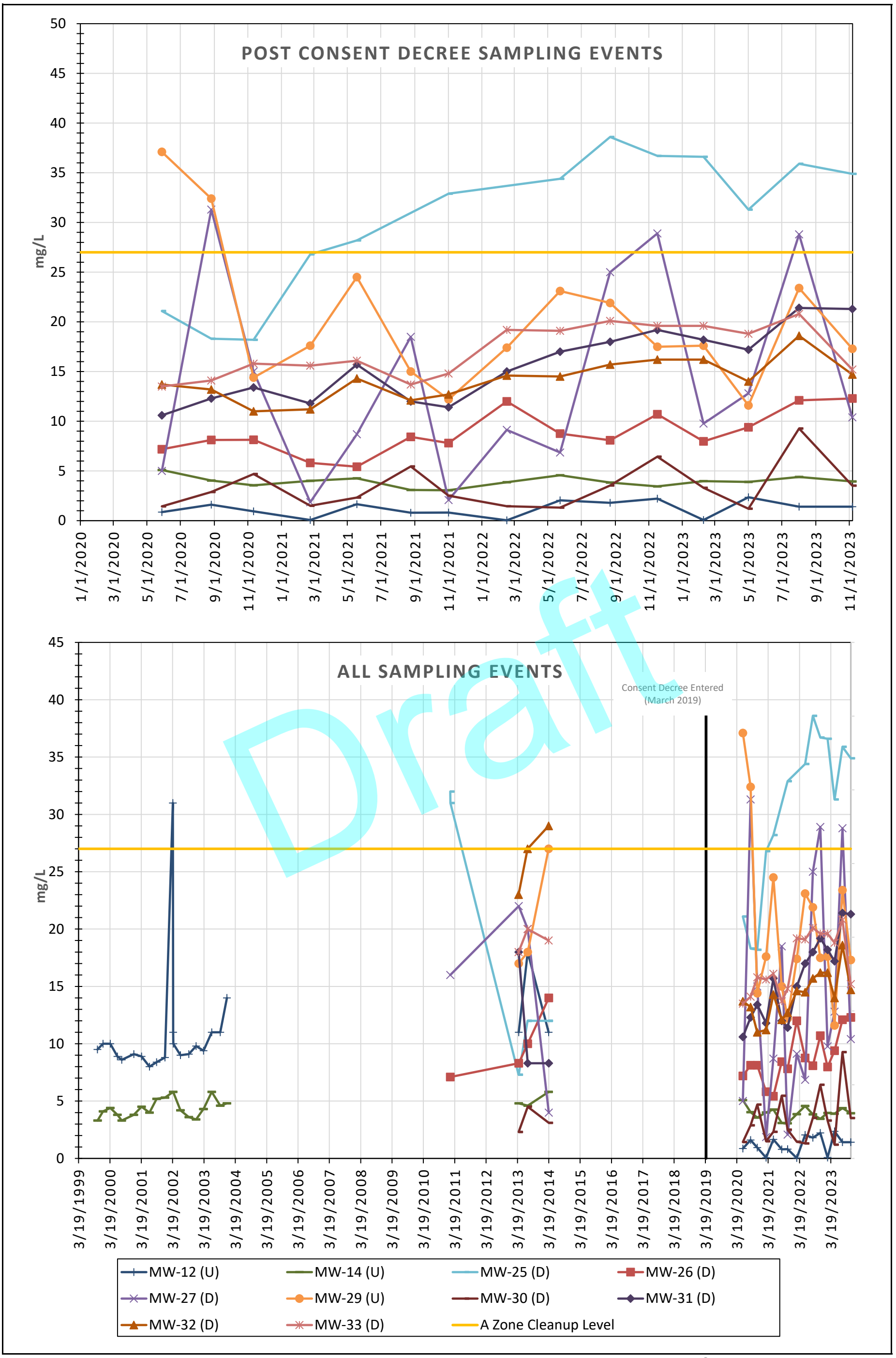
U = The analyte was analyzed for but was not detected above the reported sample quantitation limit.

Abbreviations:

µg/L Micrograms per liter
mg/L Milligrams per liter
µS/cm Microsiemens per centimeter
NTU Nephelometric Turbidity unit
CPOC Conditional point of compliance

Attachment 3

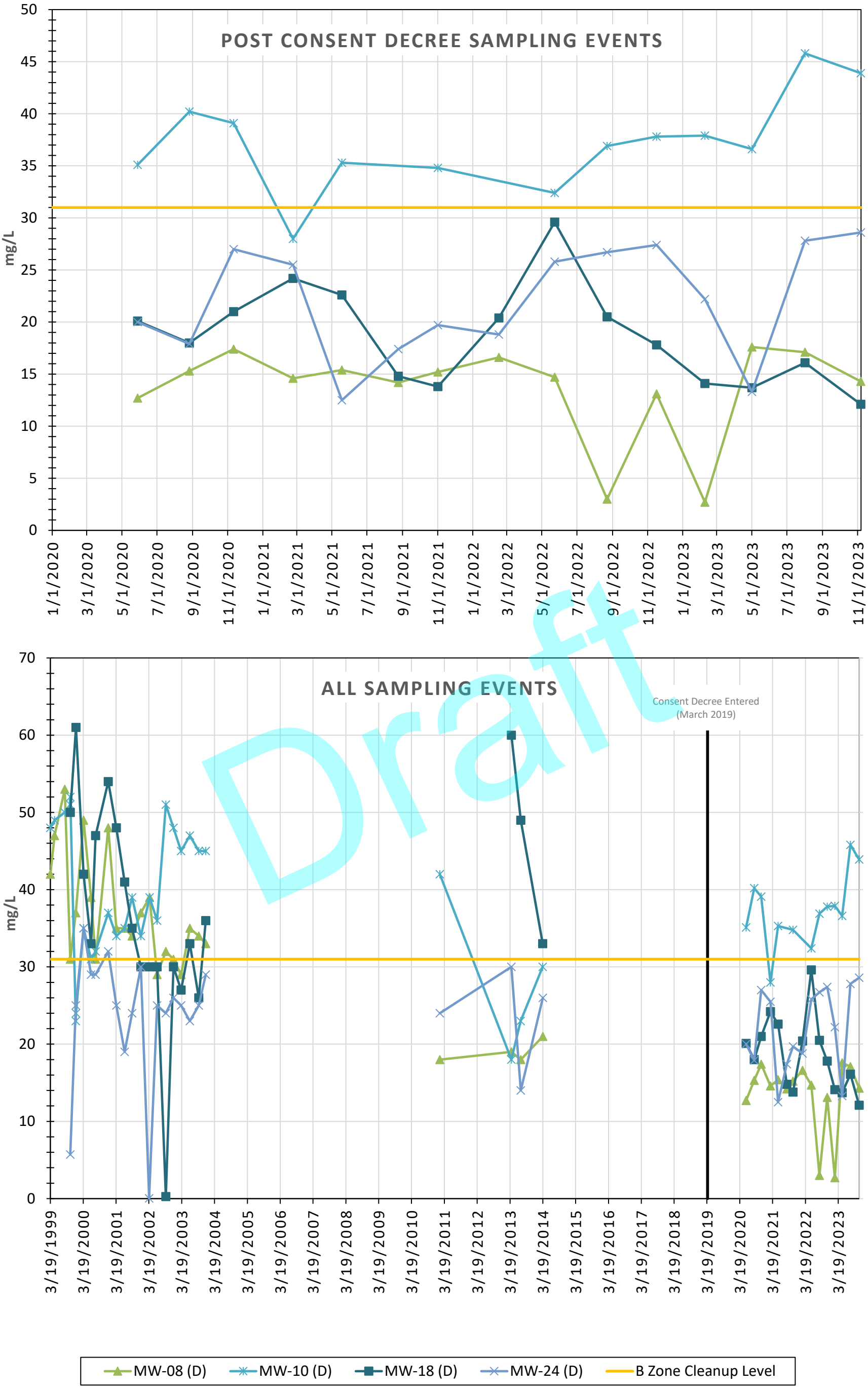
Draft Groundwater Quality Time Series
Plots through Fourth Quarter 2023



Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

Total Iron Concentrations
A-Zone CPOC Wells
South Park Landfill



Parametrix
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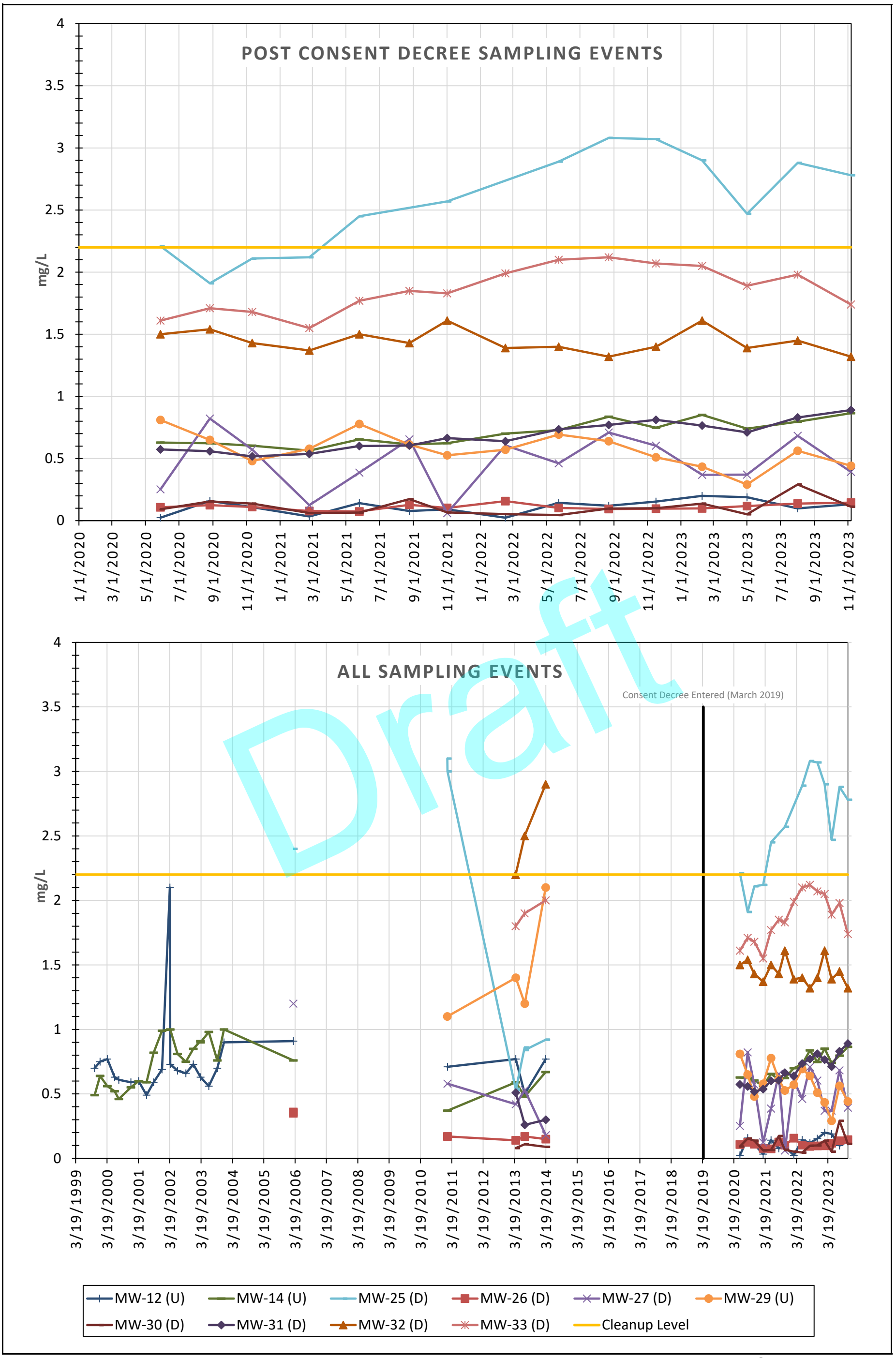
D = Downgradient
U = Upgradient

Total Iron Concentrations
B-Zone CPOC Wells
South Park Landfill



Parametrix
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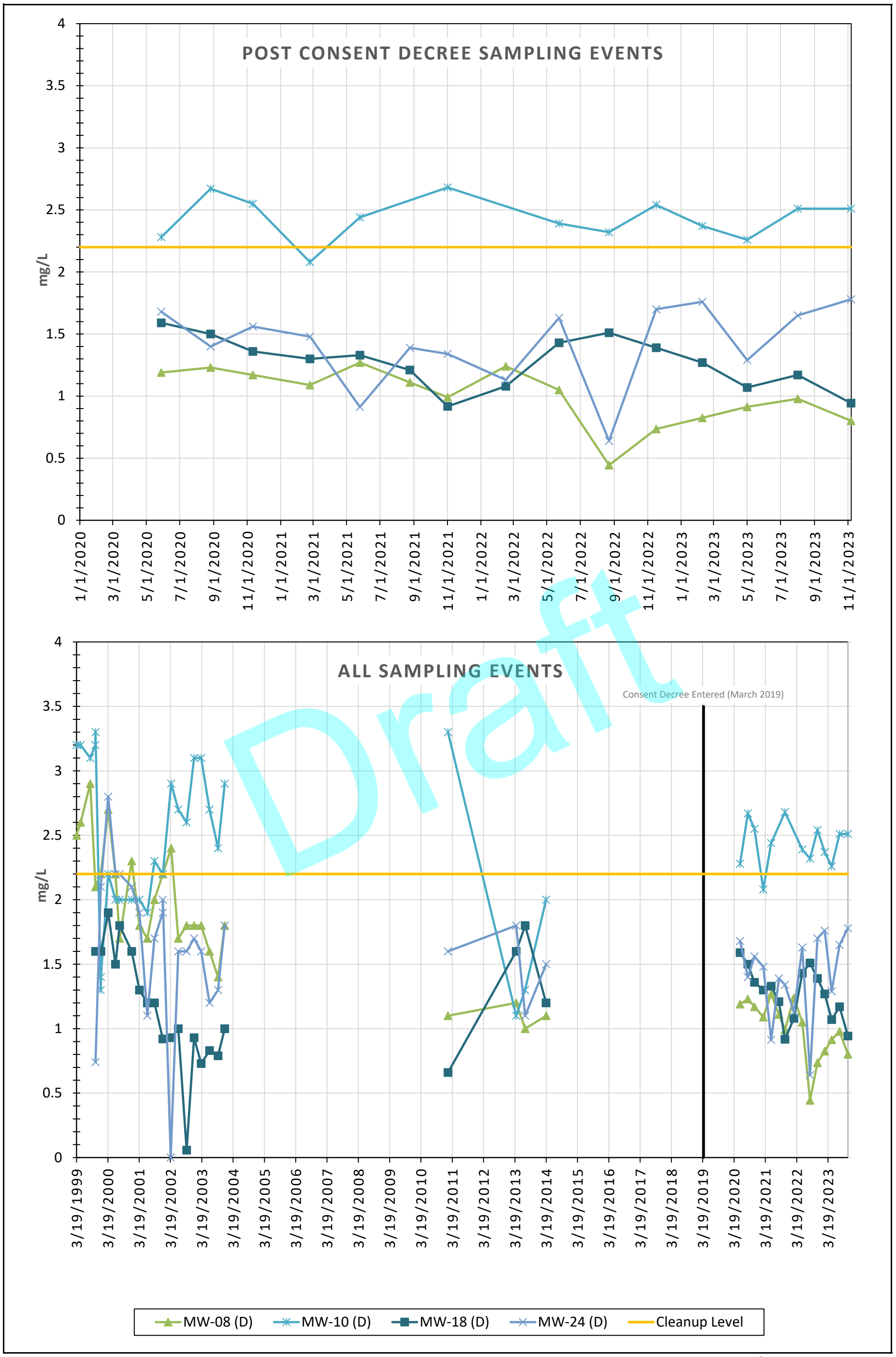
D = Downgradient
U = Upgradient

Total Manganese Concentrations
A-Zone CPOC Wells
South Park Landfill



Parametrix
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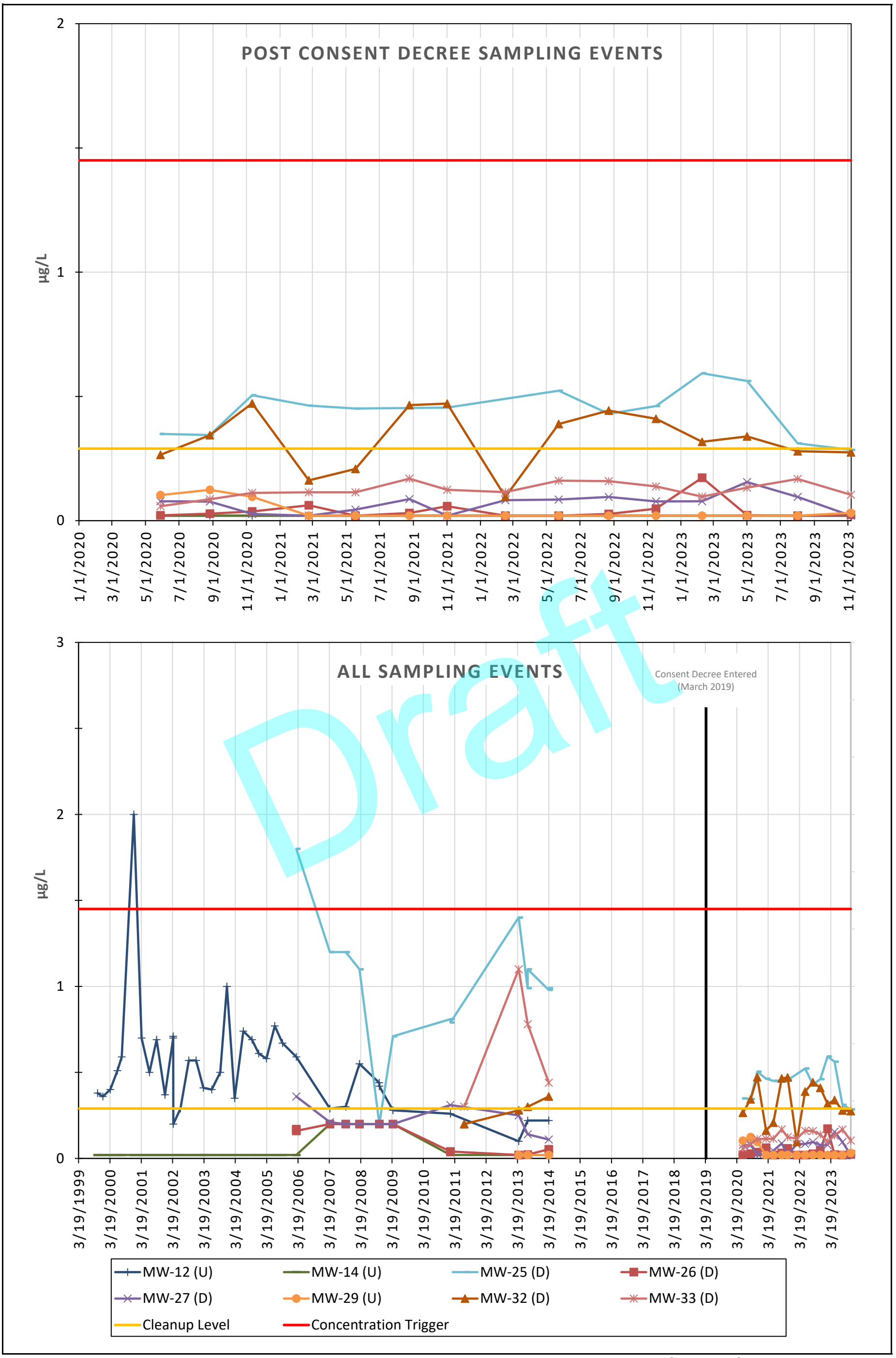
D = Downgradient
U = Upgradient

Total Manganese Concentrations
B-Zone CPOC Wells
South Park Landfill



Parametrix
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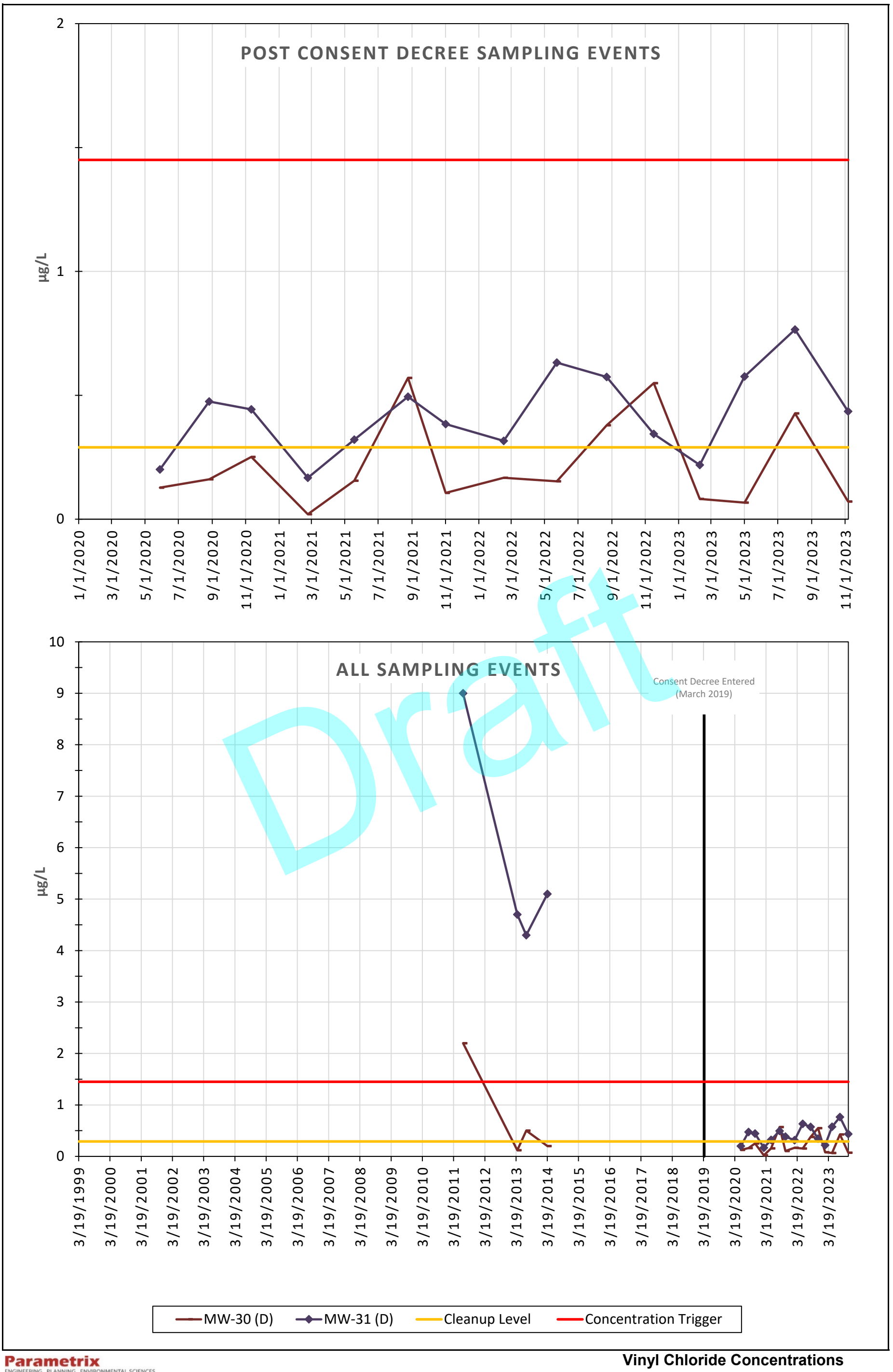
D = Downgradient
U = Upgradient

Vinyl Chloride Concentrations
A-Zone CPOC Wells
South Park Landfill



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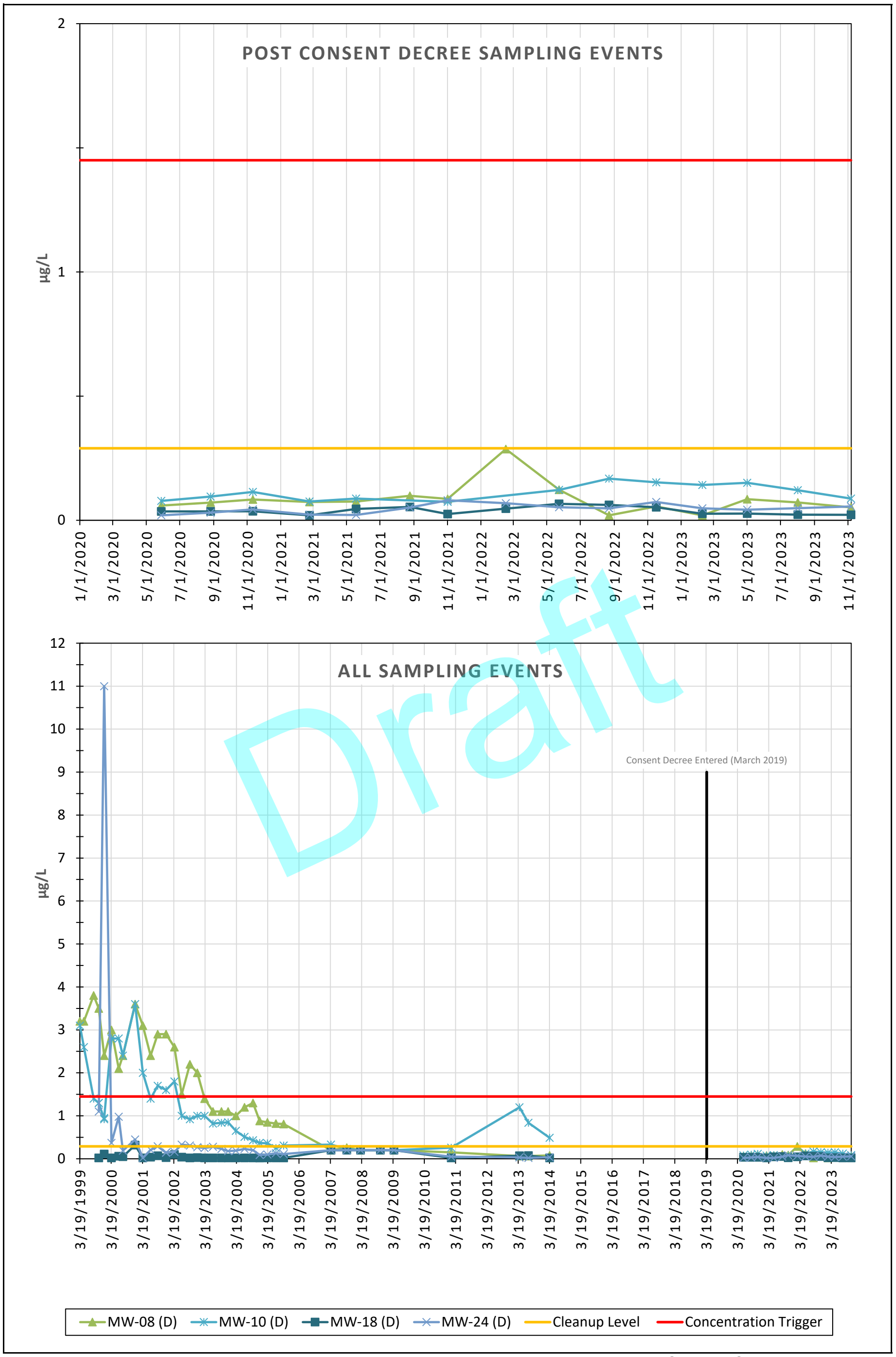
D = Downgradient
U = Upgradient

Vinyl Chloride Concentrations
A-Zone Non-CPOC Wells
South Park Landfill



Parametrix
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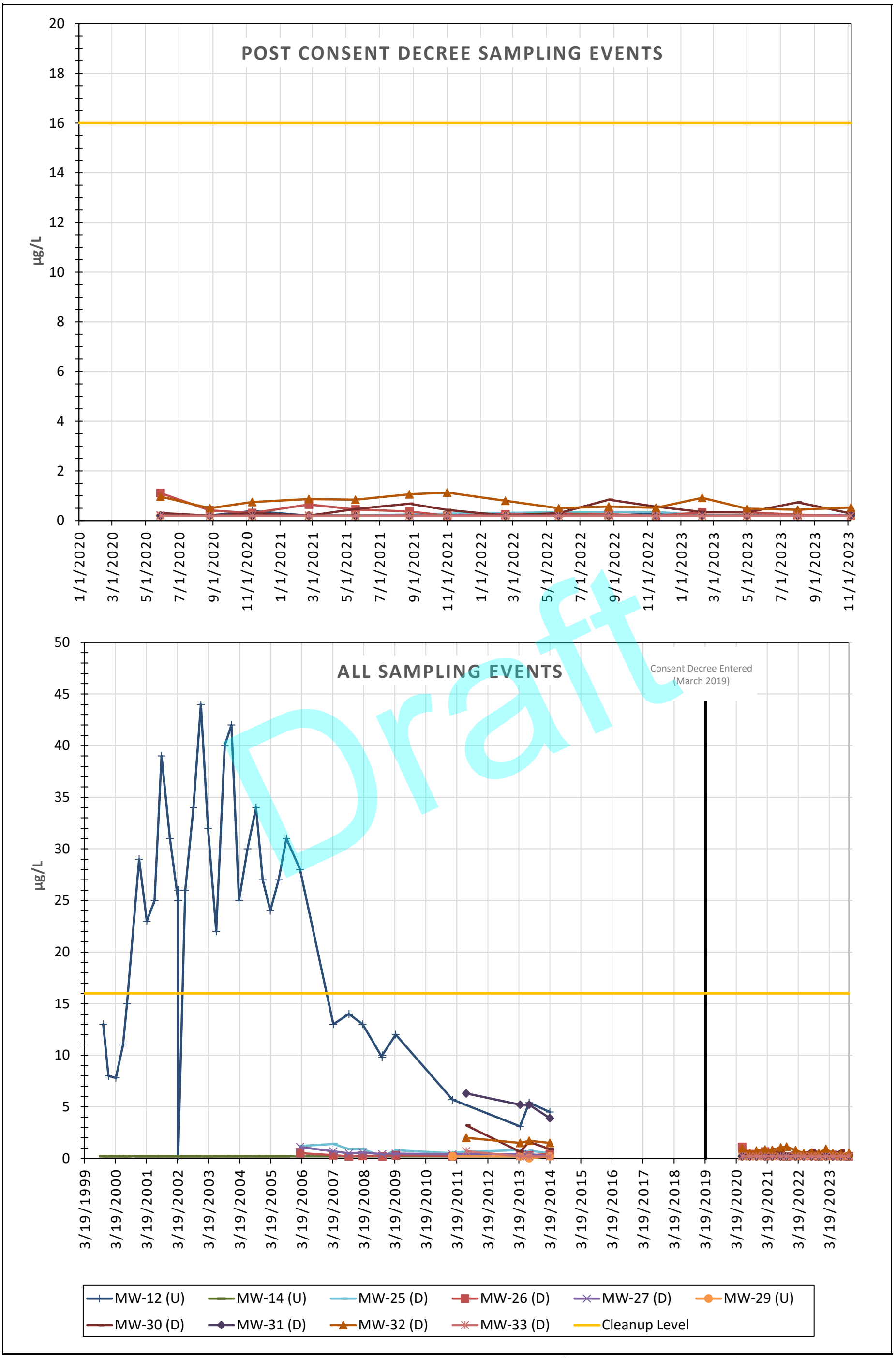
D = Downgradient
U = Upgradient

Vinyl Chloride Concentrations
B-Zone CPOC Wells
South Park Landfill



Parametrix
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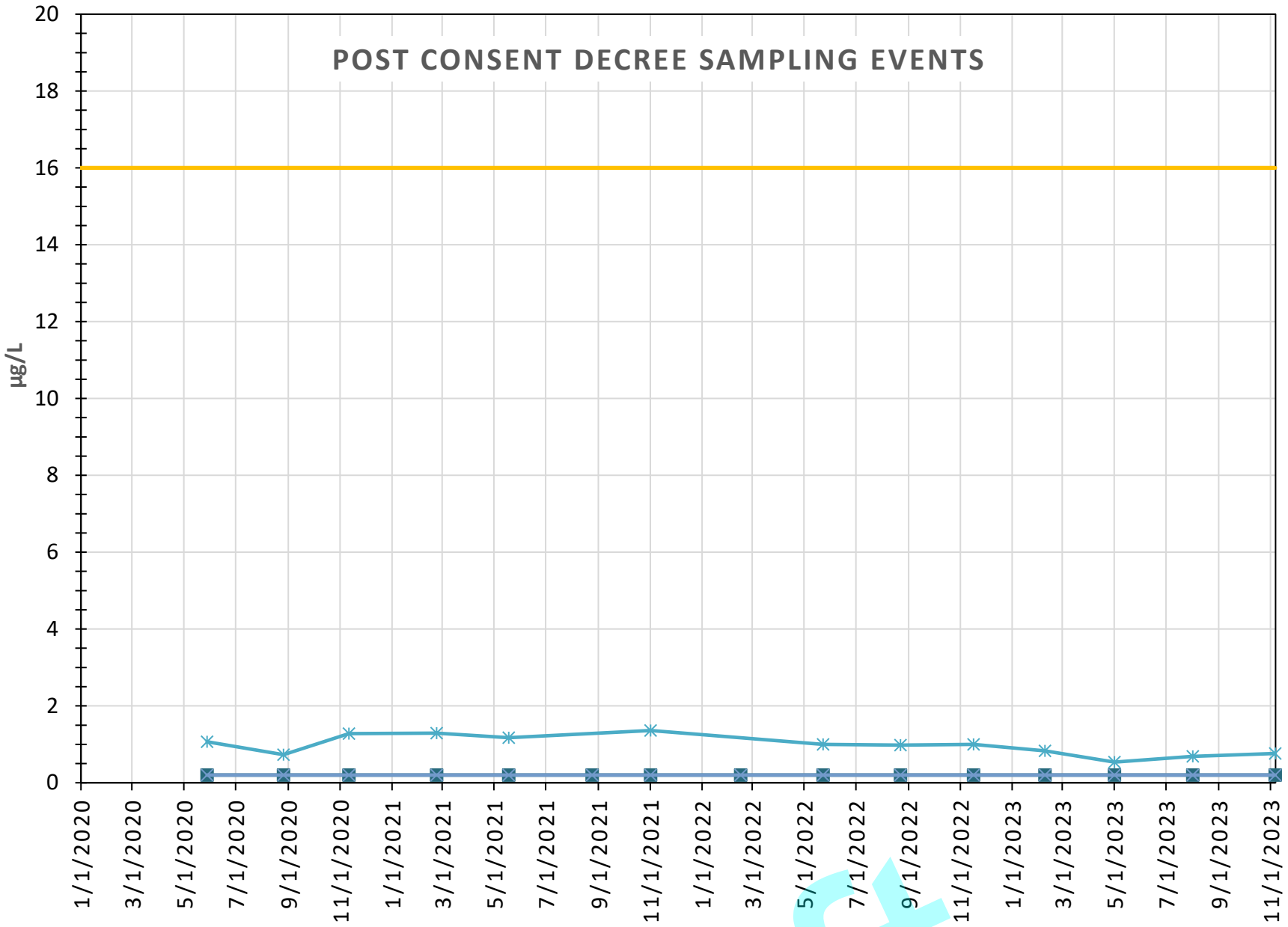
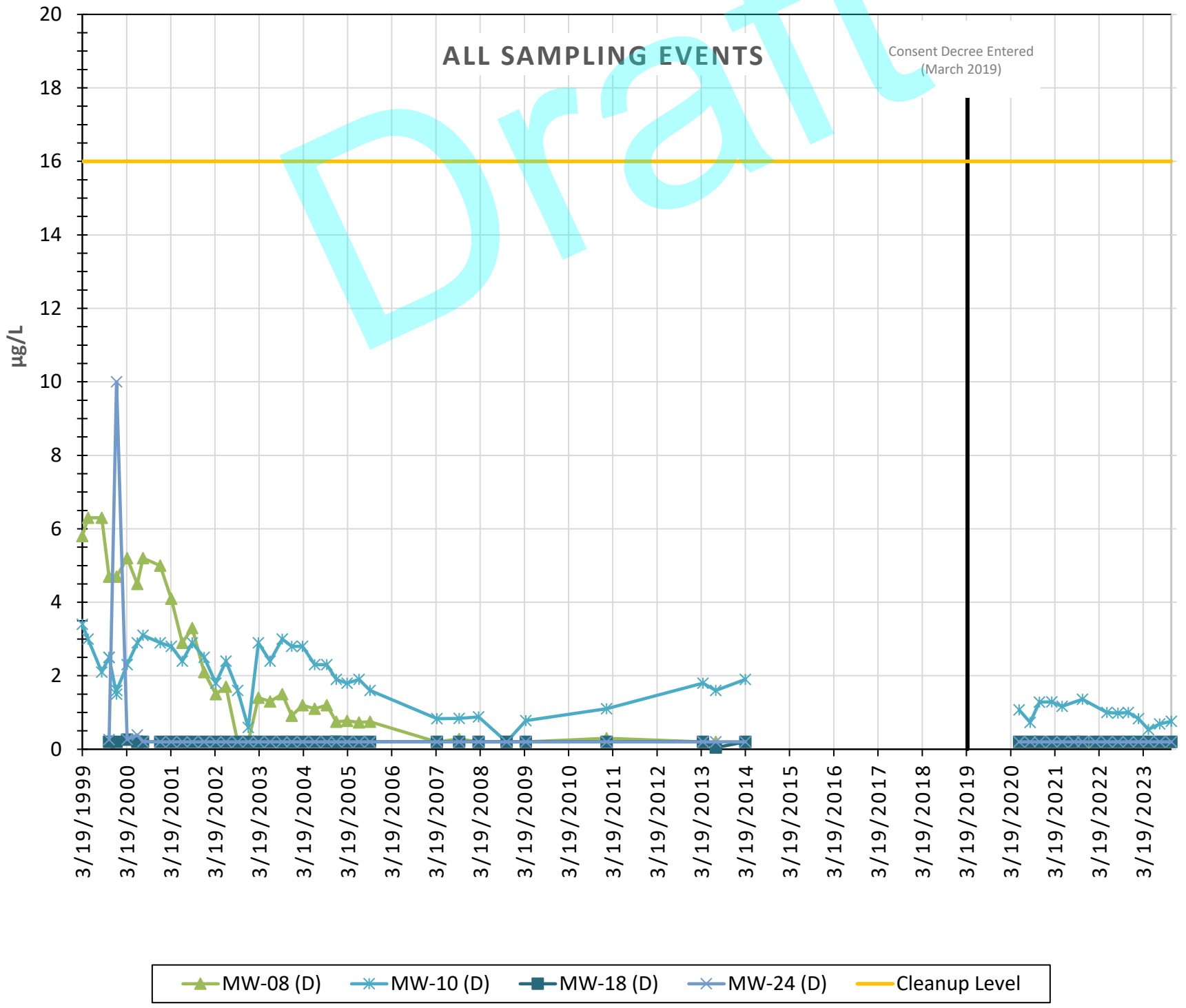
D = Downgradient
U = Upgradient

Cis-1,2-Dichloroethene Concentrations
A-Zone CPOC Wells
South Park Landfill





Parametrix
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D = Downgradient
U = Upgradient

Cis-1,2-Dichloroethene Concentrations
B-Zone CPOC Wells
South Park Landfill

Attachment 4

Fourth Quarter 2023 Groundwater
Laboratory Data

Analytical Resources, LLC
Analytical Chemists and Consultants
Tukwila, WA

28 November 2023

Min-Soon Yim
Seattle Public Utilities
700-5th Ave, Ste 4900, Box 34018
Seattle, WA 98124-4018

RE: South Park Landfill -Parametrix Water (553-155-067)

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
23K0184	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, LLC

Kelly Bottem, Client Services Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006-012

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23K0184	Turn-around Requested: 2 weeks	Date: 11/6/2023	
ARI Client Company: Min Soon Yim, Seattle Public Utility	Phone: 206 684-7693	Page: 1 of 2	
Client Contact: Laura Lee	Phone: 206 394-3665	No. of Coolers: 1	Cooler Temps: 4.1c
Client Project Name: SPU South Park Landfill			
	Samplers: Chris Bourgeois HWA		

Analytical Resources, Incorporated
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Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	Analysis Requested: cis-1,2-DCE	Vinyl Chloride	Total Fe, Mn							Notes/Comments
~~SPL-GW-MW12-1123~~			water	7	X	X	X							
~~SPL-GW-MW14-1123~~			water	7	X	X	X							
SPL-GW-MW29-1123			water	7	X	X	X							
~~SPL-GW-MW18-1123~~			water	7	X	X	X							
SPL-GW-MW32-1123	11/6/23	1045	water	7	X	X	X							
SPL-GW-MW33-1123	11/6/23	1200	water	7	X	X	X							
SPL-GW-MW10-1123	11/6/23	1310	water	13	X	X	X							MS/MSD
SPL-GW-MW60-1123	11/6/23	1350	water	7	X	X	X							
SPL-GW-MW80-1123	—	—	water	2	X	X								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Chris Bourgeois	Printed Name: Matthew Daniel	Printed Name:	Printed Name:
	Company: HWA	Company: ARLLC	Company:	Company:
	Date & Time: 11/6/23	Date & Time: 11/06/23 1516	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by work order or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23K0184	Turn-around Requested: 2 weeks	Date: 11/6/2023	
ARI Client Company: Min Soon Yim, Seattle Public Utility	Phone: 206 684-7693	Page: 2 of 2	
Client Contact: Laura Lee, Parametrix	Phone: 206 394-3665	No. of Coolers:	Cooler Temps:
Client Project Name: SPU South Park Landfill			
Client Project #: 553-1550-067	Samplers: Chris Bourgeois HWA		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	Analysis Requested: cis-1,2-DCE	Vinyl Chloride	Total Fe, Mn								Notes/Comments
SPL-GW-MW25-1123	11/6/23	1430	water	7	X	X	X								
~~SPL-GW-MW30-1123~~			water	7	X	X	X								
~~SPL-GW-MW31-1123~~			water	7	X	X	X								
~~SPL-GW-MW24-1123~~			water	7	X	X	X								
~~SPL-GW-MW26-1123~~			water	7	X	X	X								
~~SPL-GW-MW08-1123~~			water	7	X	X	X								
~~SPL-GW-MW27-1123~~			water	13	X	X	X								MS/MSD
~~SPL-GW-MW61-1123~~			water	7	X	X	X								
~~SPL-GW-MW81-1123~~			water	2	X	X									

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Chris Bourgeois	Printed Name: Matthew Samuel	Printed Name:	Printed Name:
	Company: HWA	Company: ARI LLC	Company:	Company:
	Date & Time: 11/6/23	Date & Time: 11/06/23 1516	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by work order or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SPL-GW-MW32-1123	23K0184-01	Water	06-Nov-2023 10:45	06-Nov-2023 15:16
SPL-GW-MW33-1123	23K0184-02	Water	06-Nov-2023 12:00	06-Nov-2023 15:16
SPL-GW-MW10-1123	23K0184-03	Water	06-Nov-2023 13:10	06-Nov-2023 15:16
SPL-GW-MW60-1123	23K0184-04	Water	06-Nov-2023 13:50	06-Nov-2023 15:16
SPL-GW-MW80-1123	23K0184-05	Water	06-Nov-2023 00:00	06-Nov-2023 15:16
SPL-GW-MW25-1123	23K0184-06	Water	06-Nov-2023 14:30	06-Nov-2023 15:16

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Work Order Case Narrative

Client: Seattle Public Utilities
Project: South Park Landfill
Work Order: 23K0184

Sample receipt

Samples as listed on the preceding page were received November 6, 2023 under ARI work order 23K0184. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits.

Total Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

Analytical Resources, LLC
Analytical Chemists and Consultants

Printed: 11/7/2023 9:43:54AM

WORK ORDER

23K0184

Samples will be discarded 90 days after submission of a final report unless other instructions are received

Client: Seattle Public Utilities | **Project Manager:** Kelly Bottem

Project: South Park Landfill -Parametrix Water | **Project Number:** 553-155-067

Preservation Confirmation

Container ID	Container Type	pH
23K0184-01 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
23K0184-01 B	VOA Vial, Clear, 40 mL, HCL	
23K0184-01 C	VOA Vial, Clear, 40 mL, HCL	
23K0184-01 D	VOA Vial, Clear, 40 mL, HCL	
23K0184-01 E	VOA Vial, Clear, 40 mL, HCL	
23K0184-01 F	VOA Vial, Clear, 40 mL, HCL	
23K0184-01 G	VOA Vial, Clear, 40 mL, HCL	
23K0184-02 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
23K0184-02 B	VOA Vial, Clear, 40 mL, HCL	
23K0184-02 C	VOA Vial, Clear, 40 mL, HCL	
23K0184-02 D	VOA Vial, Clear, 40 mL, HCL	
23K0184-02 E	VOA Vial, Clear, 40 mL, HCL	
23K0184-02 F	VOA Vial, Clear, 40 mL, HCL	
23K0184-02 G	VOA Vial, Clear, 40 mL, HCL	
23K0184-03 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
23K0184-03 B	VOA Vial, Clear, 40 mL, HCL	
23K0184-03 C	VOA Vial, Clear, 40 mL, HCL	
23K0184-03 D	VOA Vial, Clear, 40 mL, HCL	
23K0184-03 E	VOA Vial, Clear, 40 mL, HCL	
23K0184-03 F	VOA Vial, Clear, 40 mL, HCL	
23K0184-03 G	VOA Vial, Clear, 40 mL, HCL	
23K0184-03 H	VOA Vial, Clear, 40 mL, HCL	
23K0184-03 I	VOA Vial, Clear, 40 mL, HCL	
23K0184-03 J	VOA Vial, Clear, 40 mL, HCL	
23K0184-03 K	VOA Vial, Clear, 40 mL, HCL	
23K0184-03 L	VOA Vial, Clear, 40 mL, HCL	
23K0184-03 M	VOA Vial, Clear, 40 mL, HCL	
23K0184-04 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
23K0184-04 B	VOA Vial, Clear, 40 mL, HCL	
23K0184-04 C	VOA Vial, Clear, 40 mL, HCL	
23K0184-04 D	VOA Vial, Clear, 40 mL, HCL	
23K0184-04 E	VOA Vial, Clear, 40 mL, HCL	
23K0184-04 F	VOA Vial, Clear, 40 mL, HCL	
23K0184-04 G	VOA Vial, Clear, 40 mL, HCL	

Reviewed By _____ Date _____

Analytical Resources, LLC
Analytical Chemists and Consultants

Printed: 11/7/2023 9:43:54AM

WORK ORDER

23K0184

Samples will be discarded 90 days after submission of a final report unless other instructions are received

Client: Seattle Public Utilities | **Project Manager:** Kelly Bottem

Project: South Park Landfill -Parametrix Water | **Project Number:** 553-155-067

23K0184-05 A	VOA Vial, Clear, 40 mL, HCL	
23K0184-05 B	VOA Vial, Clear, 40 mL, HCL	
23K0184-06 A	HDPE NM, 500 mL, 1:1 HNO3	<2 Pass
23K0184-06 B	VOA Vial, Clear, 40 mL, HCL	
23K0184-06 C	VOA Vial, Clear, 40 mL, HCL	
23K0184-06 D	VOA Vial, Clear, 40 mL, HCL	
23K0184-06 E	VOA Vial, Clear, 40 mL, HCL	
23K0184-06 F	VOA Vial, Clear, 40 mL, HCL	
23K0184-06 G	VOA Vial, Clear, 40 mL, HCL	

KFC
Preservation Confirmed By

11-7-23
Date

Reviewed By

Date

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Seattle Public Utility — Project Name: SPU South Park Landfill

COC No(s): _____ (NA) — Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 23K0184 — Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 4.1c

Time 1516

If cooler temperature is out of compliance fill out form 00070F — Temp Gun ID#: 50070708

Cooler Accepted by: MD Date: 11/08/23 Time: 1516

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used?	Bubble Wrap (Wet Ice) Gel Packs (Baggies) Foam Block Paper Other: _____		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
How were bottles sealed in plastic bags?	Individually	(Grouped)	Not
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	(YES)	NO
Were all VOC vials free of air bubbles?	NA	YES	(NO)
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	(NA)	_____	

Were the sample(s) split by ARI? (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: KFC Date: 11-7-23 Time: 0901 Labels checked by: KFC

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW32-1123
23K0184-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/06/2023 10:45
Instrument: NT20 Analyst: LH — Analyzed: 11/08/2023 10:59

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0184-01 E
Preparation Batch: BLK0236 — Sample Size: 10 mL
Prepared: 11/08/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.53	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*103*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW32-1123

23K0184-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/06/2023 10:45

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 14:02

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0184-01 B

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.275	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*95.9*	*%*	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW32-1123

23K0184-01 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/06/2023 10:45

Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:31

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0184-01 A 01

Preparation Batch: BLK0517 — Sample Size: 25 mL

Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	10	0.360	14.7	mg/L	D
Manganese	7439-96-5	10	0.00500	1.32	mg/L	D

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW33-1123

23K0184-02 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/06/2023 12:00

Instrument: NT20 Analyst: LH — Analyzed: 11/08/2023 11:22

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0184-02 E

Preparation Batch: BLK0236 — Sample Size: 10 mL

Prepared: 11/08/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*101*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW33-1123

23K0184-02 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/06/2023 12:00

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 14:22

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0184-02 B

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.104	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*96.7*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW33-1123

23K0184-02 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/06/2023 12:00

Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:28

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0184-02 A 01

Preparation Batch: BLK0517 — Sample Size: 25 mL

Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	50	1.80	15.2	mg/L	D
Manganese	7439-96-5	50	0.0250	1.74	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW10-1123

23K0184-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/06/2023 13:10

Instrument: NT20 Analyst: LH — Analyzed: 11/08/2023 11:45

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0184-03 H

Preparation Batch: BLK0236 — Sample Size: 10 mL

Prepared: 11/08/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.76	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*102*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW10-1123

23K0184-03 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/06/2023 13:10

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 14:43

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0184-03 B

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0877	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*98.0*	*%*	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW10-1123

23K0184-03 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/06/2023 13:10

Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:14

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0184-03 A 01

Preparation Batch: BLK0517 — Sample Size: 25 mL

Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	50	1.80	43.9	mg/L	D
Manganese	7439-96-5	50	0.0250	2.51	mg/L	D

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW60-1123

23K0184-04 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/06/2023 13:50

Instrument: NT20 Analyst: LH — Analyzed: 11/08/2023 12:08

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0184-04 E

Preparation Batch: BLK0236 — Sample Size: 10 mL

Prepared: 11/08/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.75	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*102*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW60-1123

23K0184-04 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/06/2023 13:50

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 15:04

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0184-04 B

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0850	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*97.5*	*%*	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW60-1123

23K0184-04 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/06/2023 13:50

Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:30

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0184-04 A 01

Preparation Batch: BLK0517 — Sample Size: 25 mL

Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	50	1.80	44.5	mg/L	D
Manganese	7439-96-5	50	0.0250	2.63	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW80-1123

23K0184-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/06/2023 00:00

Instrument: NT20 Analyst: LH — Analyzed: 11/08/2023 12:31

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0184-05 A

Preparation Batch: BLK0236 — Sample Size: 10 mL

Prepared: 11/08/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*101*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW80-1123

23K0184-05 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/06/2023 00:00

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 15:24

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0184-05 B

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*96.4*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW25-1123

23K0184-06 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/06/2023 14:30

Instrument: NT20 Analyst: LH — Analyzed: 11/08/2023 12:54

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0184-06 E

Preparation Batch: BLK0236 — Sample Size: 10 mL

Prepared: 11/08/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.23	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*99.1*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW25-1123

23K0184-06 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/06/2023 14:30

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 15:45

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0184-06 B

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.285	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*94.6*	*%*	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

SPL-GW-MW25-1123

23K0184-06 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/06/2023 14:30

Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:12

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0184-06 A 01

Preparation Batch: BLK0517 — Sample Size: 25 mL

Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	100	3.60	34.9	mg/L	D
Manganese	7439-96-5	100	0.0500	2.78	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLK0236 - EPA 8260D

Instrument: NT20 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLK0236-BLK1)				Prepared: 08-Nov-2023 Analyzed: 08-Nov-2023 09:04						
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	4.94		ug/L	*5.00*		*98.9*	*80-129*			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLK0236 - EPA 8260D

Instrument: NT20 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BLK0236-BS1)				Prepared: 08-Nov-2023 Analyzed: 08-Nov-2023 07:33						
cis-1,2-Dichloroethene	10.3	0.20	ug/L	10.0		103	80-121			
Surrogate: 1,2-Dichloroethane-d4	4.97		ug/L	*5.00*		*99.3*	*80-129*			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLK0236 - EPA 8260D

Instrument: NT20 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BLK0236-BSD1)				Prepared: 08-Nov-2023 Analyzed: 08-Nov-2023 08:19						
cis-1,2-Dichloroethene	13.4	0.20	ug/L	10.0		134	80-121	25.80	30	*
Surrogate: 1,2-Dichloroethane-d4	5.03		ug/L	*5.00*		*101*	*80-129*			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLK0236 - EPA 8260D

Instrument: NT20 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BLK0236-MS1)	**Source: 23K0184-03**		Prepared: 08-Nov-2023 Analyzed: 08-Nov-2023 16:31							
cis-1,2-Dichloroethene	10.7	0.20	ug/L	10.0	0.76	99.8	80-121			
Surrogate: 1,2-Dichloroethane-d4	5.05		ug/L	*5.00*	*5.08*	*101*	*80-129*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLK0236 - EPA 8260D

Instrument: NT20 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BLK0236-MSD1)	**Source: 23K0184-03**		Prepared: 08-Nov-2023 Analyzed: 08-Nov-2023 16:54							
cis-1,2-Dichloroethene	10.9	0.20	ug/L	10.0	0.76	101	80-121	1.41	30	
Surrogate: 1,2-Dichloroethane-d4	5.03		ug/L	*5.00*	*5.08*	*101*	*80-129*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLK0236 - EPA 8260D

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLK0289 - EPA 8260D-SIM

Instrument: NT16 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLK0289-BLK1)				Prepared: 09-Nov-2023 Analyzed: 09-Nov-2023 13:19						
Vinyl chloride	ND	0.0200	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	4750		ug/L	*5000*		*95.0*	*80-129*			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLK0289 - EPA 8260D-SIM

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BLK0289-BS1)				Prepared: 09-Nov-2023 Analyzed: 09-Nov-2023 11:42						
Vinyl chloride	2.04	0.0200	ug/L	2.00		102	62-141			
Surrogate: 1,2-Dichloroethane-d4	4760		ug/L	*5000*		*95.2*	*80-129*			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLK0289 - EPA 8260D-SIM

Instrument: NT16 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BLK0289-BSD1)				Prepared: 09-Nov-2023 Analyzed: 09-Nov-2023 12:38						
Vinyl chloride	2.35	0.0200	ug/L	2.00		117	62-141	13.90	30	
Surrogate: 1,2-Dichloroethane-d4	4670		ug/L	*5000*		*93.3*	*80-129*			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLK0289 - EPA 8260D-SIM

Instrument: NT16 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BLK0289-MS1)	**Source: 23K0184-03**		Prepared: 09-Nov-2023 Analyzed: 09-Nov-2023 20:12							
Vinyl chloride	2.11	0.0200	ug/L	2.00	0.0877	101	62-141			
Surrogate: 1,2-Dichloroethane-d4	5010		ug/L	*5000*	*4900*	*100*	*80-129*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLK0289 - EPA 8260D-SIM

Instrument: NT16 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BLK0289-MSD1)	**Source: 23K0184-03**		Prepared: 09-Nov-2023 Analyzed: 09-Nov-2023 20:32							
Vinyl chloride	2.14	0.0200	ug/L	2.00	0.0877	102	62-141	1.19	30	
Surrogate: 1,2-Dichloroethane-d4	4980		ug/L	*5000*	*4900*	*99.6*	*80-129*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLK0289 - EPA 8260D-SIM

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLK0517 - EPA 6020B

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLK0517-BLK1)				Prepared: 17-Nov-2023 Analyzed: 17-Nov-2023 16:08							
Manganese	55	ND	0.000500	mg/L							U
Blank (BLK0517-BLK2)				Prepared: 17-Nov-2023 Analyzed: 24-Nov-2023 17:06							
Iron	54	ND	0.0360	mg/L							U
LCS (BLK0517-BS1)				Prepared: 17-Nov-2023 Analyzed: 17-Nov-2023 16:13							
Manganese	55	0.0244	0.000500	mg/L	0.0250		97.5	80-120			
LCS (BLK0517-BS2)				Prepared: 17-Nov-2023 Analyzed: 24-Nov-2023 17:08							
Iron	54	4.96	0.0360	mg/L	5.00		99.1	80-120			
Duplicate (BLK0517-DUP1)		**Source: 23K0184-03**		Prepared: 17-Nov-2023 Analyzed: 17-Nov-2023 18:47							
Manganese	55	2.38	0.0250	mg/L		2.51			5.44	20	D
Duplicate (BLK0517-DUP2)		**Source: 23K0184-03**		Prepared: 17-Nov-2023 Analyzed: 24-Nov-2023 17:16							
Iron	54	41.1	1.80	mg/L		43.9			6.59	20	D
Matrix Spike (BLK0517-MS1)		**Source: 23K0184-03**		Prepared: 17-Nov-2023 Analyzed: 17-Nov-2023 18:51							
Manganese	55	2.46	0.0250	mg/L	0.0250	2.51	-208	75-125			HC, D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike (BLK0517-MS2)		**Source: 23K0184-03**		Prepared: 17-Nov-2023 Analyzed: 24-Nov-2023 17:18							
Iron	54	47.6	1.80	mg/L	5.00	43.9	73.8	75-125			HC, D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BLK0517-MSD1)		**Source: 23K0184-03**		Prepared: 17-Nov-2023 Analyzed: 17-Nov-2023 18:56							
Manganese	55	2.41	0.0250	mg/L	0.0250	2.51	-417	75-125	2.15	20	HC, D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BLK0517-MSD2)		**Source: 23K0184-03**		Prepared: 17-Nov-2023 Analyzed: 24-Nov-2023 17:19							
Iron	54	47.8	1.80	mg/L	5.00	43.9	77.6	75-125	0.39	20	HC, D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Certified Analyses included in this Report

Analyte	Certifications
EPA 6020B in Water	
Iron-54	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
EPA 8260D in Water	
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
EPA 8260D-SIM in Water	
Vinyl chloride	NELAP,WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2025
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2025
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2024

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:40

Notes and Definitions

*	Flagged value is not within established control limits.
D	The reported value is from a dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Analytical Resources, LLC
Analytical Chemists and Consultants
Tukwila, WA

28 November 2023

Min-Soon Yim
Seattle Public Utilities
700-5th Ave, Ste 4900, Box 34018
Seattle, WA 98124-4018

RE: South Park Landfill -Parametrix Water (553-155-067)

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
23K0260	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, LLC

Kelly Bottem, Client Services Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006-012

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23K0260 | Turn-around Requested: 2 weeks | Date: 11/8/23

ARI Client Company: Min Soon Yim, Seattle Public Utility | Phone: 206 684-7693 | Page: 1 of 2

Client Contact: Laura Lee | Phone: 206 394-3665 | No. of Coolers: 2 | Cooler Temps: 1.6 1.3

Client Project Name: SPU South Park Landfill

Samplers: Chris Bourgeois HWA

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	Analysis Requested: cis-1,2-DCE	Vinyl Chloride	Total Fe, Mn							Notes/Comments
SPL-GW-MW12-1123	11/8/23	905	water	7	X	X	X							
SPL-GW-MW14-1123	11/8/23	1350	water	7	X	X	X							
SPL-GW-MW29-1123	11/8/23	1020	water	7	X	X	X							
SPL-GW-MW18-1123	11/8/23	1130	water	7	X	X	X							
~~SPL-GW-MW32-1123~~			~~water~~	~~7~~	~~X~~	~~X~~	~~X~~							
~~SPL-GW-MW33-1123~~			~~water~~	~~7~~	~~X~~	~~X~~	~~X~~							
~~SPL-GW-MW10-1123~~			~~water~~	~~13~~	~~X~~	~~X~~	~~X~~							MS/MSD
~~SPL-GW-MW60-1123~~			~~water~~	~~7~~	~~X~~	~~X~~	~~X~~							
~~SPL-GW-MW80-1123~~			~~water~~	~~2~~	~~X~~	~~X~~								

Comments/Special Instructions

	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Chris Bourgeois	Matthew Bone		
Printed Name:	Chris Bourgeois	Matthew Bone		
Company:	HWA	ARI		
Date & Time:	11/8/23 1432	11/08/23 1452		

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by work order or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23K0260	Turn-around Requested: 2 weeks	Date: 11/8/23	
ARI Client Company: Min Soon Yim, Seattle Public Utility	Phone: 206 684-7693	Page: 2 of 2	
Client Contact: Laura Lee, Parametrix	Phone: 206 394-3665	No. of Coolers: 2	Cooler Temps: 1.6 1.3
Client Project Name: SPU South Park Landfill			
Client Project #: 553-1550-067	Samplers: Chris Bourgeois HWA		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	Analysis Requested: cis-1,2-DCE	Vinyl Chloride	Total Fe, Mn								Notes/Comments
~~SPL-GW-MW25-1123~~			~~water~~	~~7~~	~~X~~	~~X~~	~~X~~								
SPL-GW-MW30-1123	11/7/23	1025	water	7	X	X	X								
SPL-GW-MW31-1123	11/7/23	920	water	7	X	X	X								
SPL-GW-MW24-1123	11/7/23	1120	water	7	X	X	X								
SPL-GW-MW26-1123	11/7/23	1230	water	7	X	X	X								
SPL-GW-MW08-1123	11/7/23	1506	water	7	X	X	X								
SPL-GW-MW27-1123	11/7/23	1330	water	13	X	X	X								MS/MSD
SPL-GW-MW61-1123	11/7/23	1416	water	7	X	X	X								
SPL-GW-MW81-1123	—	—	water	2	X	X									

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Chris Bourgeois	Printed Name: Matthew Dennett	Printed Name:	Printed Name:
	Company: HWA	Company: ARLL	Company:	Company:
	Date & Time: 11/8/23 1432	Date & Time: 11/08/23 1432	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by work order or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SPL-GW-MW12-1123	23K0260-01	Water	08-Nov-2023 09:05	08-Nov-2023 14:32
SPL-GW-MW14-1123	23K0260-02	Water	08-Nov-2023 13:50	08-Nov-2023 14:32
SPL-GW-MW29-1123	23K0260-03	Water	08-Nov-2023 10:20	08-Nov-2023 14:32
SPL-GW-MW18-1123	23K0260-04	Water	08-Nov-2023 11:30	08-Nov-2023 14:32
SPL-GW-MW30-1123	23K0260-05	Water	07-Nov-2023 10:25	08-Nov-2023 14:32
SPL-GW-MW31-1123	23K0260-06	Water	07-Nov-2023 09:20	08-Nov-2023 14:32
SPL-GW-MW24-1123	23K0260-07	Water	07-Nov-2023 11:20	08-Nov-2023 14:32
SPL-GW-MW26-1123	23K0260-08	Water	07-Nov-2023 12:30	08-Nov-2023 14:32
SPL-GW-MW08-1123	23K0260-09	Water	07-Nov-2023 15:00	08-Nov-2023 14:32
SPL-GW-MW27-1123	23K0260-10	Water	07-Nov-2023 13:30	08-Nov-2023 14:32
SPL-GW-MW61-1123	23K0260-11	Water	07-Nov-2023 14:10	08-Nov-2023 14:32
SPL-GW-MW81-1123	23K0260-12	Water	07-Nov-2023 00:00	08-Nov-2023 14:32

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

Work Order Case Narrative

Client: Seattle Public Utilities
Project: South Park Landfill
Work Order: 23K0260

Sample receipt

Samples as listed on the preceding page were received November 8, 2023 under ARI work order 23K0260. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

advisory control limits.

Total Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

Analytical Resources, LLC
Analytical Chemists and Consultants

Printed: 11/9/2023 10:13:49AM

WORK ORDER

23K0260

Samples will be discarded 90 days after submission of a final report unless other instructions are received

Client: Seattle Public Utilities **Project Manager:** Kelly Bottem

Project: South Park Landfill -Parametrix Water **Project Number:** 553-155-067

Preservation Confirmation

Container ID	Container Type	pH	
23K0260-01 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	pall
23K0260-01 B	VOA Vial, Clear, 40 mL, HCL		
23K0260-01 C	VOA Vial, Clear, 40 mL, HCL		
23K0260-01 D	VOA Vial, Clear, 40 mL, HCL		
23K0260-01 E	VOA Vial, Clear, 40 mL		
23K0260-01 F	VOA Vial, Clear, 40 mL		
23K0260-01 G	VOA Vial, Clear, 40 mL		
23K0260-02 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	pall
23K0260-02 B	VOA Vial, Clear, 40 mL, HCL		
23K0260-02 C	VOA Vial, Clear, 40 mL, HCL		
23K0260-02 D	VOA Vial, Clear, 40 mL, HCL		
23K0260-02 E	VOA Vial, Clear, 40 mL		
23K0260-02 F	VOA Vial, Clear, 40 mL		
23K0260-02 G	VOA Vial, Clear, 40 mL		
23K0260-03 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	pall
23K0260-03 B	VOA Vial, Clear, 40 mL, HCL		
23K0260-03 C	VOA Vial, Clear, 40 mL, HCL		
23K0260-03 D	VOA Vial, Clear, 40 mL, HCL		
23K0260-03 E	VOA Vial, Clear, 40 mL		
23K0260-03 F	VOA Vial, Clear, 40 mL		
23K0260-03 G	VOA Vial, Clear, 40 mL		
23K0260-04 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	pall
23K0260-04 B	VOA Vial, Clear, 40 mL, HCL		
23K0260-04 C	VOA Vial, Clear, 40 mL, HCL		
23K0260-04 D	VOA Vial, Clear, 40 mL, HCL		
23K0260-04 E	VOA Vial, Clear, 40 mL		
23K0260-04 F	VOA Vial, Clear, 40 mL		
23K0260-04 G	VOA Vial, Clear, 40 mL		
23K0260-05 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	pall
23K0260-05 B	VOA Vial, Clear, 40 mL, HCL		
23K0260-05 C	VOA Vial, Clear, 40 mL, HCL		
23K0260-05 D	VOA Vial, Clear, 40 mL, HCL		
23K0260-05 E	VOA Vial, Clear, 40 mL		
23K0260-05 F	VOA Vial, Clear, 40 mL		

Reviewed By

Date

WORK ORDER

23K0260

Samples will be discarded 90 days after submission of a final report unless other instructions are received

Client: Seattle Public Utilities **Project Manager:** Kelly Bottem

Project: South Park Landfill -Parametrix Water **Project Number:** 553-155-067

23K0260-05 G	VOA Vial, Clear, 40 mL		
23K0260-06 A	HDPE NM, 500 mL, 1:1 HNO3	<2	pam
23K0260-06 B	VOA Vial, Clear, 40 mL, HCL		
23K0260-06 C	VOA Vial, Clear, 40 mL, HCL		
23K0260-06 D	VOA Vial, Clear, 40 mL, HCL		
23K0260-06 E	VOA Vial, Clear, 40 mL		
23K0260-06 F	VOA Vial, Clear, 40 mL		
23K0260-06 G	VOA Vial, Clear, 40 mL		
23K0260-07 A	HDPE NM, 500 mL, 1:1 HNO3	<2	pam
23K0260-07 B	VOA Vial, Clear, 40 mL, HCL		
23K0260-07 C	VOA Vial, Clear, 40 mL, HCL		
23K0260-07 D	VOA Vial, Clear, 40 mL, HCL		
23K0260-07 E	VOA Vial, Clear, 40 mL		
23K0260-07 F	VOA Vial, Clear, 40 mL		
23K0260-07 G	VOA Vial, Clear, 40 mL		
23K0260-08 A	HDPE NM, 500 mL, 1:1 HNO3	<2	pam
23K0260-08 B	VOA Vial, Clear, 40 mL, HCL		
23K0260-08 C	VOA Vial, Clear, 40 mL, HCL		
23K0260-08 D	VOA Vial, Clear, 40 mL, HCL		
23K0260-08 E	VOA Vial, Clear, 40 mL		
23K0260-08 F	VOA Vial, Clear, 40 mL		
23K0260-08 G	VOA Vial, Clear, 40 mL		
23K0260-09 A	HDPE NM, 500 mL, 1:1 HNO3	<2	pam
23K0260-09 B	VOA Vial, Clear, 40 mL, HCL		
23K0260-09 C	VOA Vial, Clear, 40 mL, HCL		
23K0260-09 D	VOA Vial, Clear, 40 mL, HCL		
23K0260-09 E	VOA Vial, Clear, 40 mL		
23K0260-09 F	VOA Vial, Clear, 40 mL		
23K0260-09 G	VOA Vial, Clear, 40 mL		
23K0260-10 A	HDPE NM, 500 mL, 1:1 HNO3	<2	pam
23K0260-10 B	VOA Vial, Clear, 40 mL, HCL		
23K0260-10 C	VOA Vial, Clear, 40 mL, HCL		
23K0260-10 D	VOA Vial, Clear, 40 mL, HCL		
23K0260-10 E	VOA Vial, Clear, 40 mL, HCL		
23K0260-10 F	VOA Vial, Clear, 40 mL, HCL		
23K0260-10 G	VOA Vial, Clear, 40 mL, HCL		

Reviewed By

Date

WORK ORDER

23K0260

Samples will be discarded 90 days after submission of a final report unless other instructions are received

Client: Seattle Public Utilities **Project Manager:** Kelly Bottem

Project: South Park Landfill -Parametrix Water **Project Number:** 553-155-067

23K0260-10 H	VOA Vial, Clear, 40 mL
23K0260-10 I	VOA Vial, Clear, 40 mL
23K0260-10 J	VOA Vial, Clear, 40 mL
23K0260-10 K	VOA Vial, Clear, 40 mL
23K0260-10 L	VOA Vial, Clear, 40 mL
23K0260-10 M	VOA Vial, Clear, 40 mL
23K0260-11 A	HDPE NM, 500 mL, 1:1 HNO3
23K0260-11 B	VOA Vial, Clear, 40 mL, HCL
23K0260-11 C	VOA Vial, Clear, 40 mL, HCL
23K0260-11 D	VOA Vial, Clear, 40 mL, HCL
23K0260-11 E	VOA Vial, Clear, 40 mL
23K0260-11 F	VOA Vial, Clear, 40 mL
23K0260-11 G	VOA Vial, Clear, 40 mL
23K0260-12 A	VOA Vial, Clear, 40 mL, HCL
23K0260-12 B	VOA Vial, Clear, 40 mL

<2 pair

Preservation Confirmed By

11/9/23
Date

Reviewed By

Date

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: SPU

Project Name: South Park Landfill

COC No(s): NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other:

Assigned ARI Job No: 23K0260

Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1432 | 1.6 | 1.3 | | | | |

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 500908

Cooler Accepted by: MD Date: 11/08/23 Time: 1432

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used?	Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other:		
Was sufficient ice used (if appropriate)?	NA	YES	NO
How were bottles sealed in plastic bags?	Individually	Grouped	Not
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA		

Were the sample(s) split by ARI? NA YES Date/Time: Equipment: Split by:

Samples Logged by: Date: 11/9/23 Time: 0949 Labels checked by: LB

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW12-1123
23K0260-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/08/2023 09:05
Instrument: NT20 Analyst: TWC — Analyzed: 11/10/2023 23:15

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-01 B
Preparation Batch: BLK0346 — Sample Size: 10 mL
Prepared: 11/10/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.24	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*106*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW12-1123

23K0260-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/08/2023 09:05

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 16:05

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-01 E

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*96.6*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW12-1123

23K0260-01 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/08/2023 09:05
Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:58

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0260-01 A 01
Preparation Batch: BLK0518 — Sample Size: 25 mL
Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	5	0.180	1.41	mg/L	D
Manganese	7439-96-5	5	0.00250	0.132	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW14-1123

23K0260-02 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/08/2023 13:50

Instrument: NT20 Analyst: TWC — Analyzed: 11/10/2023 23:39

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-02 B

Preparation Batch: BLK0346 — Sample Size: 10 mL

Prepared: 11/10/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*107*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW14-1123

23K0260-02 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/08/2023 13:50

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 16:26

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-02 E

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*96.9*	*%*	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW14-1123

23K0260-02 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/08/2023 13:50

Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:52

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0260-02 A 01

Preparation Batch: BLK0518 — Sample Size: 25 mL

Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	20	0.720	3.94	mg/L	D
Manganese	7439-96-5	20	0.0100	0.865	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW29-1123

23K0260-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/08/2023 10:20

Instrument: NT20 Analyst: TWC — Analyzed: 11/11/2023 00:02

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-03 B

Preparation Batch: BLK0346 — Sample Size: 10 mL

Prepared: 11/10/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*102*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW29-1123

23K0260-03 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/08/2023 10:20

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 16:46

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-03 E

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0312	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*96.3*	*%*	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW29-1123

23K0260-03 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/08/2023 10:20

Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:35

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0260-03 A 01

Preparation Batch: BLK0518 — Sample Size: 25 mL

Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	10	0.360	17.3	mg/L	D
Manganese	7439-96-5	10	0.00500	0.441	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW18-1123

23K0260-04 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/08/2023 11:30

Instrument: NT20 Analyst: TWC — Analyzed: 11/11/2023 00:25

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-04 B

Preparation Batch: BLK0346 — Sample Size: 10 mL

Prepared: 11/10/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*104*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW18-1123

23K0260-04 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/08/2023 11:30

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 17:07

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-04 E

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0222	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*97.5*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW18-1123

23K0260-04 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/08/2023 11:30
Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:54

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0260-04 A 01
Preparation Batch: BLK0518 — Sample Size: 25 mL
Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	20	0.720	12.1	mg/L	D
Manganese	7439-96-5	20	0.0100	0.943	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW30-1123

23K0260-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/07/2023 10:25

Instrument: NT20 Analyst: TWC — Analyzed: 11/11/2023 00:49

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-05 B

Preparation Batch: BLK0346 — Sample Size: 10 mL

Prepared: 11/10/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.29	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*108*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW30-1123

23K0260-05 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/07/2023 10:25

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 17:28

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-05 E

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0710	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*96.3*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW30-1123

23K0260-05 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/07/2023 10:25

Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:59

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0260-05 A 01

Preparation Batch: BLK0518 — Sample Size: 25 mL

Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	5	0.180	3.52	mg/L	D
Manganese	7439-96-5	5	0.00250	0.112	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW31-1123

23K0260-06 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/07/2023 09:20

Instrument: NT20 Analyst: TWC — Analyzed: 11/11/2023 01:12

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-06 B

Preparation Batch: BLK0346 — Sample Size: 10 mL

Prepared: 11/10/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*104*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW31-1123

23K0260-06 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/07/2023 09:20

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 17:48

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-06 E

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.435	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*97.4*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW31-1123

23K0260-06 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/07/2023 09:20
Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:55

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0260-06 A 01
Preparation Batch: BLK0518 — Sample Size: 25 mL
Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	20	0.720	21.3	mg/L	D
Manganese	7439-96-5	20	0.0100	0.890	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW24-1123

23K0260-07 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/07/2023 11:20

Instrument: NT20 Analyst: TWC — Analyzed: 11/11/2023 01:35

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-07 B

Preparation Batch: BLK0346 — Sample Size: 10 mL

Prepared: 11/10/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*106*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW24-1123

23K0260-07 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/07/2023 11:20

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 18:09

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-07 E

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0559	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*97.5*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW24-1123

23K0260-07 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/07/2023 11:20

Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:51

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0260-07 A 01

Preparation Batch: BLK0518 — Sample Size: 25 mL

Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	50	1.80	28.6	mg/L	D
Manganese	7439-96-5	50	0.0250	1.78	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW26-1123

23K0260-08 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/07/2023 12:30

Instrument: NT20 Analyst: TWC — Analyzed: 11/11/2023 01:59

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-08 B

Preparation Batch: BLK0346 — Sample Size: 10 mL

Prepared: 11/10/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*107*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW26-1123

23K0260-08 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/07/2023 12:30

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 18:29

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-08 E

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0240	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*97.4*	*%*	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW26-1123

23K0260-08 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/07/2023 12:30

Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 18:01

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0260-08 A 01

Preparation Batch: BLK0518 — Sample Size: 25 mL

Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	5	0.180	12.3	mg/L	D
Manganese	7439-96-5	5	0.00250	0.145	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW08-1123

23K0260-09 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/07/2023 15:00

Instrument: NT20 Analyst: TWC — Analyzed: 11/11/2023 02:22

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-09 B

Preparation Batch: BLK0346 — Sample Size: 10 mL

Prepared: 11/10/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*107*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW08-1123

23K0260-09 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/07/2023 15:00

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 18:50

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-09 E

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0520	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*98.6*	*%*	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW08-1123

23K0260-09 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/07/2023 15:00
Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:57

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0260-09 A 01
Preparation Batch: BLK0518 — Sample Size: 25 mL
Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	20	0.720	14.3	mg/L	D
Manganese	7439-96-5	20	0.0100	0.802	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW27-1123

23K0260-10 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/07/2023 13:30

Instrument: NT20 Analyst: TWC — Analyzed: 11/11/2023 02:46

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-10 B

Preparation Batch: BLK0346 — Sample Size: 10 mL

Prepared: 11/10/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*107*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW27-1123

23K0260-10 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/07/2023 13:30

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 19:10

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-10 H

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*97.7*	*%*	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW27-1123

23K0260-10 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/07/2023 13:30

Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:37

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0260-10 A 01

Preparation Batch: BLK0518 — Sample Size: 25 mL

Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	10	0.360	10.4	mg/L	D
Manganese	7439-96-5	10	0.00500	0.393	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW61-1123

23K0260-11 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/07/2023 14:10

Instrument: NT20 Analyst: TWC — Analyzed: 11/11/2023 03:09

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-11 B

Preparation Batch: BLK0346 — Sample Size: 10 mL

Prepared: 11/10/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*106*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW61-1123

23K0260-11 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/07/2023 14:10

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 19:31

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-11 E

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*97.7*	*%*	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW61-1123

23K0260-11 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 11/07/2023 14:10

Instrument: ICPMS2 Analyst: MCB — Analyzed: 11/24/2023 17:33

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23K0260-11 A 01

Preparation Batch: BLK0518 — Sample Size: 25 mL

Prepared: 11/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	10	0.360	10.5	mg/L	D
Manganese	7439-96-5	10	0.00500	0.397	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW81-1123

23K0260-12 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 11/07/2023 00:00

Instrument: NT20 Analyst: TWC — Analyzed: 11/11/2023 03:32

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-12 A

Preparation Batch: BLK0346 — Sample Size: 10 mL

Prepared: 11/10/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*109*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

SPL-GW-MW81-1123

23K0260-12 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 11/07/2023 00:00

Instrument: NT16 Analyst: TWC — Analyzed: 11/09/2023 19:51

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23K0260-12 B

Preparation Batch: BLK0289 — Sample Size: 10 mL

Prepared: 11/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*97.4*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLK0346 - EPA 8260D

Instrument: NT20 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLK0346-BLK1)			Prepared: 10-Nov-2023 Analyzed: 10-Nov-2023 22:29							
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5.12		ug/L	*5.00*		*102*	*80-129*			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLK0346 - EPA 8260D

Instrument: NT20 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BLK0346-BS1)				Prepared: 10-Nov-2023 Analyzed: 10-Nov-2023 21:19						
cis-1,2-Dichloroethene	10.2	0.20	ug/L	10.0		102	80-121			
Surrogate: 1,2-Dichloroethane-d4	4.94		ug/L	*5.00*		*98.9*	*80-129*			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLK0346 - EPA 8260D

Instrument: NT20 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BLK0346-BSD1)				Prepared: 10-Nov-2023 Analyzed: 10-Nov-2023 21:42						
cis-1,2-Dichloroethene	9.78	0.20	ug/L	10.0		97.8	80-121	4.14	30	
Surrogate: 1,2-Dichloroethane-d4	5.00		ug/L	*5.00*		*100*	*80-129*			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLK0346 - EPA 8260D

Instrument: NT20 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BLK0346-MS1)	**Source: 23K0260-10**		Prepared: 10-Nov-2023 Analyzed: 11-Nov-2023 05:53							
cis-1,2-Dichloroethene	9.67	0.20	ug/L	10.0	ND	96.7	80-121			
Surrogate: 1,2-Dichloroethane-d4	5.36		ug/L	*5.00*	*5.34*	*107*	*80-129*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLK0346 - EPA 8260D

Instrument: NT20 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BLK0346-MSD1)	**Source: 23K0260-10**		Prepared: 10-Nov-2023 Analyzed: 11-Nov-2023 06:16							
cis-1,2-Dichloroethene	8.60	0.20	ug/L	10.0	ND	86.0	80-121	11.80	30	
Surrogate: 1,2-Dichloroethane-d4	5.15		ug/L	*5.00*	*5.34*	*103*	*80-129*			

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700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLK0346 - EPA 8260D

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLK0289 - EPA 8260D-SIM

Instrument: NT16 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLK0289-BLK1)			Prepared: 09-Nov-2023 Analyzed: 09-Nov-2023 13:19							
Vinyl chloride	ND	0.0200	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	4750		ug/L	*5000*		*95.0*	*80-129*			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLK0289 - EPA 8260D-SIM

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BLK0289-BS1)				Prepared: 09-Nov-2023 Analyzed: 09-Nov-2023 11:42						
Vinyl chloride	2.04	0.0200	ug/L	2.00		102	62-141			
Surrogate: 1,2-Dichloroethane-d4	4760		ug/L	*5000*		*95.2*	*80-129*			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLK0289 - EPA 8260D-SIM

Instrument: NT16 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BLK0289-BSD1)				Prepared: 09-Nov-2023 Analyzed: 09-Nov-2023 12:38						
Vinyl chloride	2.35	0.0200	ug/L	2.00		117	62-141	13.90	30	
Surrogate: 1,2-Dichloroethane-d4	4670		ug/L	*5000*		*93.3*	*80-129*			

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Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLK0289 - EPA 8260D-SIM

Instrument: NT16 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BLK0289-MS2)	**Source: 23K0260-10**		Prepared: 09-Nov-2023 Analyzed: 09-Nov-2023 20:53							
Vinyl chloride	2.01	0.0200	ug/L	2.00	ND	99.9	62-141			
Surrogate: 1,2-Dichloroethane-d4	4930		ug/L	*5000*	*4880*	*98.7*	*80-129*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLK0289 - EPA 8260D-SIM

Instrument: NT16 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BLK0289-MSD2)	**Source: 23K0260-10**		Prepared: 09-Nov-2023 Analyzed: 09-Nov-2023 21:14							
Vinyl chloride	2.02	0.0200	ug/L	2.00	ND	100	62-141	0.52	30	
Surrogate: 1,2-Dichloroethane-d4	4960		ug/L	*5000*	*4880*	*99.2*	*80-129*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLK0289 - EPA 8260D-SIM

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLK0518 - EPA 6020B

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLK0518-BLK1)				Prepared: 17-Nov-2023 Analyzed: 24-Nov-2023 17:09							
Iron	54	ND	0.0360	mg/L							U
Manganese	55	ND	0.000500	mg/L							U
LCS (BLK0518-BS1)				Prepared: 17-Nov-2023 Analyzed: 24-Nov-2023 17:11							
Iron	54	4.92	0.0360	mg/L	5.00		98.3	80-120			
Manganese	55	0.0246	0.000500	mg/L	0.0250		98.4	80-120			
Duplicate (BLK0518-DUP1)		**Source: 23K0260-10**		Prepared: 17-Nov-2023 Analyzed: 24-Nov-2023 17:39							
Iron	54	9.80	0.360	mg/L		10.4			5.96	20	D
Manganese	55	0.379	0.00500	mg/L		0.393			3.63	20	D
Matrix Spike (BLK0518-MS1)		**Source: 23K0260-10**		Prepared: 17-Nov-2023 Analyzed: 24-Nov-2023 17:41							
Iron	54	15.2	0.360	mg/L	5.00	10.4	95.5	75-125			D
Manganese	55	0.405	0.00500	mg/L	0.0250	0.393	47.8	75-125			HC, D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BLK0518-MSD1)		**Source: 23K0260-10**		Prepared: 17-Nov-2023 Analyzed: 24-Nov-2023 17:42							
Iron	54	15.2	0.360	mg/L	5.00	10.4	96.9	75-125	0.48	20	D
Manganese	55	0.410	0.00500	mg/L	0.0250	0.393	69.1	75-125	1.30	20	HC, D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											

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Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	28-Nov-2023 11:55

Certified Analyses included in this Report

Analyte	Certifications
EPA 6020B in Water	
Iron-54	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
EPA 8260D in Water	
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
EPA 8260D-SIM in Water	
Vinyl chloride	NELAP,WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2025
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2025
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2024

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Notes and Definitions

D	The reported value is from a dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.