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Cathcart Landfill Environmental Monitoring Report

Rec 2/17/21

Second Semiannual and Annual Summary

2020

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1.0 INTRODUCTION

The following report presents the results of groundwater, surface water, landfill gas, and associated infrastructure monitoring for the second semiannual monitoring period (*July through December*) of 2020 and the annual 2020 summary environmental monitoring report for the Cathcart Sanitary Landfill (*Landfill, site*). The site is located at 8915 Cathcart Way, just west of the intersection of Cathcart Way and State Route 9 in south-central Snohomish County, Washington. The location of the site relative to existing municipal improvements is shown on the **Vicinity Map** (***Figure 1***).

1.1 BACKGROUND

The Cathcart Landfill was designed and permitted in the late 1970s and was operated as a solid waste landfill for 12 years and ceased accepting any new solid waste in June 1992.

The closed landfill is approximately 60 acres in area and is part of a larger County parcel. The Cathcart Landfill is bounded by private residential property to the northwest, north and east and by other Snohomish County facilities to the south and west. Existing site improvements and the site layout are shown on the **Site Map** (***Figure 2***), and existing site topography is shown on the **Site Topographic Map** (***Figure 3***). Surficial geology of the site area is shown on the **Geologic Map** (***Figure 4***).

Leachate is collected and gravity flows to a pretreatment facility, after which it is pumped to the **City of Everett's** Wastewater Treatment Plant for final treatment and discharge. Gas generated by the landfill is collected and extracted through a negatively pressurized system and discharged through an on-site gas flaring facility.

The Landfill is currently permitted for post-closure monitoring by the Snohomish Health District (SHD) with a Solid Waste Facility Permit (SW-011, SHD 2020). Monitoring results are reviewed by both the SHD and the Department of Ecology.

1.2 MONITORING PROGRAM

The site is currently monitored following the procedures outlined in the current Sampling and Analysis Plan (**SAP**, *Snohomish County, 2020*), which was approved by Ecology and SHD in their letters dated December 11 and 17, 2020, respectively. The SAP includes changes to the monitoring program that were proposed in the County's Application of Variance, which was submitted to the SHD in 2018; the changes were conditionally approved by SHD with input from Ecology in their letter dated December 6, 2018. These changes to the monitoring program are summarized as follows:

- **Groundwater Monitoring:** Sample frequency at all wells (except for G-09S, G-09D, G-10S, and G-10D) reduced from quarterly to semiannual; reporting for all wells will be completed on a semiannual basis. Chemical analytical suites will remain unchanged from those specified in the 2006 SAP.
    - Wells G-09S, G-09D, G-10S, and G-10D will continue to be sampled quarterly and will be reported in the semiannual monitoring reports. Due to a gap in the data

for wells G-09S, G-09D, and G-10S between the third quarter 2013 and the third quarter of 2018, eight additional quarters of monitoring will be conducted to determine if a reduction to semiannual sampling frequency is warranted at those wells. Additionally, low vinyl chloride concentrations detected in those wells historically will be further evaluated during the additional quarterly monitoring period.

- **Landfill Gas Monitoring:** Quarterly monitoring at all currently monitored gas probes, barholes, vaults, and lift stations will be maintained, and new soil gas probe GP-6 will be integrated into the gas probe monitoring program to monitor for landfill gas migration on the northern edge of the Cathcart property, near the closest residences. Monitoring results will be included in the semiannual monitoring reports.
- **Surface Water Sampling:** Sample frequency at all monitoring points was reduced to semiannual; two monitoring points (CC-D1 and CC-J) were eliminated from the surface water monitoring program based on redundancy/accessibility concerns for those locations. Monitoring results will be included in the semiannual monitoring reports. Chemical analytical suites remain unchanged.

1.2.1 Groundwater Monitoring Network

Currently, a total of 17 groundwater monitoring wells (*eight shallow wells and nine deep wells*), are monitored on a semiannual basis. Of these wells, four-(*4*) are considered upgradient, and 13 are considered to be within the landfill footprint or downgradient site wells. Well locations are shown on the **Monitoring Network Map** (***Figure 5***). Groundwater monitoring results are summarized in **Section 2.0** of this report.

1.2.2 *Surface Water Monitoring Network*

Surface water monitoring stations have been established along Garden Creek and in the site stormwater detention ponds per the **SAP**. The seven surface water sampling locations consist of one-(*1*) sampling location upgradient of the site and six sampling locations within and downgradient of the site. Sampling locations are shown on **Monitoring Network Map** (***Figure 5***). Semiannual surface water monitoring results are summarized in **Section 3.0** of this report.

1.2.3 Landfill Gas Monitoring Network

Per the **SAP**, landfill gas monitoring is conducted quarterly and includes measurement of methane, oxygen, and carbon dioxide. The existing gas monitoring system consists of eight gas probes, six permanently-installed barhole probes, seven vaults, 19 manholes, and two lift stations, which surround the landfill. The gas monitoring locations are shown on the **Monitoring Network Maps** (***Figures 5 and 5a***). Quarterly landfill gas monitoring results are summarized and discussed in **Section 4.0** of this report.

2.0 GROUNDWATER MONITORING

The second semiannual groundwater monitoring events for 2020 were performed by Snohomish County personnel on August 5 and October 14 and 15, 2020.

Depths to water were measured and groundwater samples were collected in accordance with the approved **SAP**. Hydrographs of the historical and current groundwater elevations and precipitation totals are included in ***Appendix A***. The **First Semiannual 2020 Groundwater Measurements** and comparison with the previous monitoring event elevation data (*delta*) are shown in *Table 1* below.

Table 1 – First Semiannual 2020 Groundwater Measurements

Well Number	Sample Date	Top of Casing Elevation (feet above MSL)	Water Elevation (feet above MSL)	Delta* (feet)
Shallow Wells – Third Quarter 2020				
G-09S	8/5/20	273.08	242.69	-0.39
G-10S	8/5/20	266.94	243.03	-0.60
Shallow Wells – Fourth Quarter 2020				
G-01A	10/15/20	229.00	220.70	2.03
G-04A	10/15/20	286.52	271.81	-1.20
G-08D1	10/14/20	222.02	197.60	-1.19
G-09S	10/15/20	273.08	241.57	-1.51
G-10S	10/15/20	266.94	242.52	-1.11
G-11S	10/14/20	250.74	232.76	1.63
G-14S	10/14/20	328.76	315.09	-4.16
G-24S	10/14/20	321.13	306.86	-0.47
Deep Wells – Third Quarter 2020				
G-09D	8/5/20	274.60	222.67	-1.19
G-10D	8/5/20	268.32	237.41	-0.06
Deep Wells – Fourth Quarter 2020				
G-01D	10/15/20	229.96	206.62	0.81
G-02D	10/14/20	242.10	211.29	-0.61
G-06B	10/14/20	246.24	211.92	0.48
G-08D2	10/14/20	221.62	212.42	-3.77
G-09D	10/15/20	274.60	222.61	-1.25
G-10D	10/15/20	268.32	237.38	-0.09
G-13D	10/15/20	232.17	221.69	0.79
G-14D	10/14/20	329.58	297.97	-0.91
G-24D	10/14/20	320.51	301.07	-0.19

MSL = Mean sea level

* Delta = Change in groundwater elevation from previous sampling event; wells 09S/09D and 10S/10D are sampled quarterly

Groundwater Contour Maps for the shallow and deep zones during 2020 (*i.e., for the second and fourth quarter monitoring events*) are included as ***Figures 6a through 6d*** of this report.

2.2 GROUNDWATER SAMPLING

Four wells were sampled during the first and third quarters (G-09S, G-09D, G-10S, and G-10D) and 17 wells were purged and sampled during the second and fourth quarters in accordance with the procedures outlined in the **SAP** and the modified schedule approved Variance. Well performance was consistent with recent sampling events at all wells.

Samples were transported to Am Test, Inc. of Kirkland, Washington under chain-of-custody for analysis of dissolved metals, volatile organic compounds (*VOCs*), and conventional chemistry parameters. The analytical results are tabulated in ***Appendix B*** of this report and discussed below.

2.3 EVALUATION OF GROUNDWATER ANALYTICAL RESULTS

Each of the groundwater samples collected during 2020 are compared to the applicable groundwater quality standards which are summarized in ***Tables 2 and 3*** below and in ***Appendix B***. Notable observations or deviations from scope are noted below:

2.3.1 Shallow Wells

- Significant increases in the chloride concentration in well G-01A and in the nitrate concentration in well G-08D1 were noted from the second to fourth quarter monitoring event.
- A low VOC concentration of vinyl chloride (*0.04 µg/L*) was detected in the third quarter sample from well G-09S. Low concentrations of methylene chloride were also detected in wells G-09S and G-10S during the third quarter monitoring event; however, similar methylene chloride concentrations were also detected in the laboratory blank. Therefore, these concentrations likely represent contamination imparted during analysis and not actual groundwater impacts.

Table 2 – Summary of Annual 2020 Shallow Well Standard Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Groundwater Standard
Downgradient	G-01A	5/12/20	pH	std units	6.04	6.5-8.5
			Arsenic	mg/L	0.000152	0.00005
		10/15/20	pH	std units	6.01	6.5-8.5
			Arsenic	mg/L	0.000185	0.00005
	G-04A	5/13/20	pH	std units	6.28	6.5-8.5
			Arsenic	mg/L	0.0181	0.00005
			Iron	mg/L	25.9	0.3
			Manganese	mg/L	6.0	0.05
		10/15/20	Arsenic	mg/L	0.0108	0.00005
			Iron	mg/L	16.9	0.3
			Manganese	mg/L	6.83	0.05
	G-08D1	5/13/20	pH	std units	9.76	6.5-8.5
			Sodium	mg/L	104	20
			Arsenic	mg/L	0.00132	0.00005
			Iron	mg/L	0.551	0.3
		10/14/20	pH	std units	9.67	6.5-8.5
			Sodium	mg/L	110	20
			Arsenic	mg/L	0.00186	0.00005
	G-09S	1/7/20	Conductivity	µmhos/cm	950	700
			pH	std units	6.18	6.5-8.5
			Sodium	mg/L	88.5	20
			TDS	mg/L	590	500
			Arsenic	mg/L	0.000945	0.00005

Table 2 – Summary of Annual 2020 Shallow Well Standard Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Groundwater Standard
Downgradient	G-09S	5/12/20	Conductivity	µmhos/cm	990	700
			pH	std units	6.34	6.5-8.5
			Sodium	mg/L	93	20
			TDS	mg/L	630	500
			Arsenic	mg/L	0.000575	0.00005
		8/5/20	Conductivity	µmhos/cm	1000	700
			Sodium	mg/L	96.0	20
			TDS	mg/L	720	500
			Arsenic	mg/L	0.000703	0.00005
			Nickel	mg/L	0.218	0.1
			Vinyl chloride	µg/L	0.04	0.02
		10/15/20	Conductivity	µmhos/cm	1000	700
			Sodium	mg/L	93.1	20
			TDS	mg/L	700	500
			Arsenic	mg/L	0.000511	0.00005
	G-10S	1/7/20	pH	std units	6.46	6.5-8.5
			Sodium	mg/L	185	20
			Sulfate	mg/L	332	250
			TDS	mg/L	930	500
			Arsenic	mg/L	0.0071	0.00005
			Iron	mg/L	11.2	0.3
			Manganese	mg/L	3.24	0.05
		5/12/20	Conductivity	µmhos/cm	1400	700
			Sodium	mg/L	191	20
			Sulfate	mg/L	304	250
			TDS	mg/L	960	500
			Arsenic	mg/L	0.00638	0.00005
			Iron	mg/L	10.5	0.3
			Manganese	mg/L	3.14	0.05
		8/5/20	Conductivity	µmhos/cm	1400	700
			Sodium	mg/L	168	20
			Sulfate	mg/L	288	250
			TDS	mg/L	950	500
			Arsenic	mg/L	0.00516	0.00005
			Iron	mg/L	9.76	0.3
			Manganese	mg/L	3.19	0.05
			Nickel	mg/L	0.152	0.1
		10/15/20	Conductivity	µmhos/cm	1400	700
			Sodium	mg/L	169	20
			Sulfate	mg/L	282	250
			TDS	mg/L	930	500
			Arsenic	mg/L	0.00396	0.00005
			Iron	mg/L	8.03	0.3
			Manganese	mg/L	3.1	0.05
	G-11S	5/12/20	Sodium	mg/L	43.3	20
			Arsenic	mg/L	0.0006	0.00005
		10/14/20	Sodium	mg/L	41.0	20
			Arsenic	mg/L	0.000479	0.00005

Table 2 – Summary of Annual 2020 Shallow Well Standard Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Groundwater Standard
Upgradient	G-14S	5/13/20	pH	std units	9.34	6.5-8.5
			Sodium	mg/L	99.1	20
			Arsenic	mg/L	0.00344	0.00005
		10/14/20	pH	std units	9.18	6.5-8.5
			Sodium	mg/L	105.0	20
			Arsenic	mg/L	0.00341	0.00005
	G-24S	5/13/20	Sodium	mg/L	81.8	20
			Arsenic	mg/L	0.000472	0.00005
		10/14/20	Sodium	mg/L	96.6	20
			Arsenic	mg/L	0.000765	0.00005

2.3.2 *Deep Wells*

- Vinyl chloride was detected in deep well G-09D during all four 2020 sampling events at concentrations ranging from 0.14 to 0.81 µg/L. Low concentrations of methylene chloride were also detected in wells G-09D and G-10D during the third quarter monitoring event; however, similar methylene chloride concentrations were also detected in the laboratory blank. Therefore, these concentrations likely represent contamination imparted during analysis and not actual groundwater impacts.
- The arsenic concentration in well G-01D increased significantly from the second quarter 2020 (0.000176 mg/L) to the fourth quarter 2020 (0.000382 mg/L).
- The pH concentration in well G-06B increased significantly from the second quarter 2020 event (7.99 standard units) to the fourth quarter 2020 (8.84 standard units).

Table 3 – Summary of Annual 2020 Deep Well Standard Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Groundwater Standard
Downgradient	G-01D	5/12/20	pH	std units	9.35	6.5-8.5
			Sodium	mg/L	155	20
			Arsenic	mg/L	0.000176	0.00005
		10/15/20	pH	std units	10.04	6.5-8.5
			Sodium	mg/L	145	20
			Arsenic	mg/L	0.000382	0.00005
	G-02D	5/13/20	Sodium	mg/L	84.2	20
			Arsenic	mg/L	0.00307	0.00005
		10/14/20	Sodium	mg/L	83.5	20
			Arsenic	mg/L	0.00424	0.00005
	G-06B	5/12/20	Sodium	mg/L	168	20
			Arsenic	mg/L	0.0039	0.00005
		10/14/20	Conductivity	mg/L	710	700
			pH	mg/L	8.84	6.5-8.5
			Sodium	mg/L	176	20
			Arsenic	mg/L	0.00421	0.00005
	G-08D2	5/13/20	pH	std units	10.05	6.5-8.5
			Sodium	mg/L	104	20
			Arsenic	mg/L	0.000532	0.00005
			Iron	mg/L	0.686	0.3

Table 3 – Summary of Annual 2020 Deep Well Standard Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Groundwater Standard
Downgradient	G-08D2	10/14/20	pH	std units	9.85	6.5-8.5
			Sodium	mg/L	111	20
			Arsenic	mg/L	0.000616	0.00005
	G-09D	1/7/20	Conductivity	µmhos/cm	840	700
			pH	std units	9.03	6.5-8.5
			Sodium	mg/L	202	20
			Arsenic	mg/L	0.00251	0.00005
			Vinyl chloride	µg/L	0.81	0.02
		5/12/20	Conductivity	µmhos/cm	720	700
			pH	std units	9.22	6.5-8.5
			Sodium	mg/L	181	20
			Arsenic	mg/L	0.00295	0.00005
			Vinyl chloride	µg/L	0.74	0.02
		8/5/20	pH	std units	9.47	6.5-8.5
			Sodium	mg/L	177	20
			Arsenic	mg/L	0.00363	0.00005
			Vinyl chloride	µg/L	0.14	0.02
		10/15/20	Conductivity	µmhos/cm	730	700
			pH	std units	9.88	6.5-8.5
			Sodium	mg/L	164	20
			Arsenic	mg/L	0.00231	0.00005
			Vinyl chloride	µg/L	0.23	0.02
	G-10D	1/7/20	Conductivity	µmhos/cm	1600	700
			Sodium	mg/L	348	20
			Sulfate	mg/L	317	250
			TDS	mg/L	1000	500
			Arsenic	mg/L	0.0015	0.00005
			Iron	mg/L	0.631	0.3
			Manganese	mg/L	0.397	0.05
		5/12/20	Conductivity	µmhos/cm	1500	700
			Sodium	mg/L	357	20
			Sulfate	mg/L	298	250
			TDS	mg/L	990	500
			Arsenic	mg/L	0.0012	0.00005
			Iron	mg/L	0.538	0.3
			Manganese	mg/L	0.356	0.05
		8/5/20	Conductivity	µmhos/cm	1600	700
			Sodium	mg/L	308	20
			Sulfate	mg/L	274	250
			TDS	mg/L	1000	500
			Arsenic	mg/L	0.0052	0.00005
			Iron	mg/L	0.543	0.3
			Manganese	mg/L	0.376	0.05
			Nickel	mg/L	0.189	0.1

Table 3 – Summary of Annual 2020 Deep Well Standard Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Groundwater Standard
Downgradient	G-10D	10/15/20	Conductivity	µmhos/cm	1600	700
			Sodium	mg/L	325	20
			Sulfate	mg/L	283	250
			TDS	mg/L	1100	500
			Arsenic	mg/L	0.0008	0.00005
			Iron	mg/L	0.471	0.3
			Manganese	mg/L	0.362	0.05
	G-13D	5/12/20	pH	std units	9.44	6.5-8.5
			Sodium	mg/L	107	20
			Arsenic	mg/L	0.000183	0.00005
		10/15/20	pH	std units	10.13	6.5-8.5
			Sodium	mg/L	107	20
			Arsenic	mg/L	0.000102	0.00005
Upgradient	G-14D	5/13/20	pH	std units	9.84	6.5-8.5
			Sodium	mg/L	112	20
			Arsenic	mg/L	0.000722	0.00005
		10/14/20	pH	std units	9.88	6.5-8.5
			Sodium	mg/L	120	20
			Arsenic	mg/L	0.000691	0.00005
	G-24D	5/13/20	pH	std units	8.80	6.5-8.5
			Sodium	mg/L	115	20
		10/14/20	pH	std units	8.80	6.5-8.5
			Sodium	mg/L	138	20
			Arsenic	mg/L	0.000053	0.00005

2.4 STATISTICAL EVALUATION

Where exceedances to the WAC groundwater standards occur, statistical analysis is performed as specified in the **SAP** using **DUMPStat Statistical Software** (*Version 3.0 by Robert D. Gibbons Ltd., 2018*) to determine the significance of the change.

Details regarding the statistical analyses are found in the SAP and in monitoring reports submitted prior to 2019. Per **Ecology** and **Snohomish Health District** request, the statistical prediction limits for each groundwater zone were previously updated in the first quarter of the year and subsequent data sets were compared against that prediction limit. However, since the first semiannual monitoring event for all wells does not occur until the second quarter, the prediction limits are updated annually following the second quarter sampling event.

2.4.1 Shallow Groundwater Well Statistical Results

Analytes that exceeded the calculated prediction limits in the shallow zone wells and the observed concentration trends are summarized in ***Tables 4 and 5*** below and ***Appendix B***. Plots of the shallow zone groundwater statistical analyses are included in ***Appendix C***.

Table 4 – Summary of Annual 2020 Shallow Well Prediction Limit Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Prediction Limit
Downgradient	G-01A	5/12/20	None	--	--	--
		10/15/20	None	--	--	--
	G-04A	5/13/20	Calcium	mg/L	44.4	23.8526
			COD	mg/L	57	16
			Arsenic	mg/L	0.0181	0.0038
			Cobalt	mg/L	0.011	0.003
			Iron	mg/L	25.9	0.3
		10/15/20	Alkalinity	mg/L	230	200
			Bicarbonate	mg/L	230	200
			Calcium	mg/L	46.5	23.8526
			Arsenic	mg/L	0.0108	0.0038
			Cobalt	mg/L	0.011	0.011
			Iron	mg/L	16.9	16.9
	G-08D1	5/13/20	pH	std units	9.76	6.00-9.39
		10/14/20	pH	std units	9.67	6.00-9.39
	G-09S	1/7/20	Alkalinity	mg/L	340	200
			Bicarbonate	mg/L	340	200
			Calcium	mg/L	81.1	23.9949
			Conductivity	µmhos/cm	950	540
			Potassium	mg/L	4.81	2.7196
			Sulfate	mg/L	180	250
			TDS	mg/L	590	405.899
			Vanadium	mg/L	0.011	0.01
		5/12/20	Alkalinity	mg/L	360	200
			Bicarbonate	mg/L	360	200
			Calcium	mg/L	80.1	23.8526
			Conductivity	µmhos/cm	990	540
			Potassium	mg/L	4.55	2.7509
			Sulfate	mg/L	194	169
			TDS	mg/L	630	404.5425
		8/5/20	Alkalinity	mg/L	350	200
			Bicarbonate	mg/L	350	200
			Calcium	mg/L	88.2	23.8526
			COD	mg/L	18	16
			Conductivity	µmhos/cm	1000	540
			Potassium	mg/L	5.55	2.7509
			Sulfate	mg/L	209	169
			TDS	mg/L	720	404.5425
			Nickel	mg/L	0.218	0.038
		10/15/20	Alkalinity	mg/L	330	200
			Bicarbonate	mg/L	330	200
			Calcium	mg/L	83.2	23.8526
			Conductivity	µmhos/cm	1000	540
			Potassium	mg/L	5.16	2.7509
			Sulfate	mg/L	197	169
			TDS	mg/L	700	404.5425

Table 4 – Summary of Annual 2020 Shallow Well Prediction Limit Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Prediction Limit
Downgradient	G-10S	1/7/20	Alkalinity	mg/L	450	200
			Bicarbonate	mg/L	450	200
			Calcium	mg/L	104	23.9949
			Potassium	mg/L	3.7	2.7196
			Sodium	mg/L	185	125.8433
			Sulfate	mg/L	332	135.0174
			TDS	mg/L	930	405.899
			Arsenic	mg/L	0.0071	0.004
		5/12/20	Alkalinity	mg/L	450	200
			Bicarbonate	mg/L	450	200
			Calcium	mg/L	101	23.8526
			Conductivity	µmhos/cm	1400	540
			Potassium	mg/L	3.37	2.7509
			Sodium	mg/L	191	123
			Sulfate	mg/L	304	169
			TDS	mg/L	960	404.5425
			Arsenic	mg/L	0.00638	0.0038
			Iron	mg/L	10.5	10.4257
		8/5/20	Alkalinity	mg/L	490	200
			Bicarbonate	mg/L	490	200
			Calcium	mg/L	100	23.8526
			COD	mg/L	26	16
			Conductivity	µmhos/cm	1400	540
			Potassium	mg/L	4.18	2.7509
			Sodium	mg/L	168	123
			Sulfate	mg/L	288	169
			TDS	mg/L	950	404.5425
			Arsenic	mg/L	0.00516	0.0038
			Nickel	mg/L	0.152	0.038
		10/15/20	Alkalinity	mg/L	470	200
			Bicarbonate	mg/L	470	200
			Calcium	mg/L	96	23.8526
			Conductivity	µmhos/cm	1400	540
			Potassium	mg/L	3.5	2.7509
			Sodium	mg/L	169	123
			Sulfate	mg/L	282	169
			TDS	mg/L	930	404.5425
			Arsenic	mg/L	0.00396	0.0038
	G-11S	5/12/20	None	--	--	--
		10/14/20	None	--	--	--
Upgradient	G-14S	5/13/20	None	--	--	--
		10/14/20	Alkalinity	mg/L	220	200
	G-24S	5/13/20	None	--	--	--
		10/14/20	Alkalinity	mg/L	230	200

Significant increasing and decreasing concentration trends for the second semiannual 2020 monitoring events and for 2020 overall were noted in shallow groundwater, as summarized in ***Table 5*** below.

Table 5 – Significant Trends, Shallow Wells 2020

Well	Date	Significant Trends			
		Second Semiannual 2020		2020 Overall	
		Increasing	Decreasing	Increasing	Decreasing
Downgradient Wells					
G-01A	10/15/20	None	None	None	Sodium
G-04A	10/15/20	Chloride, potassium, arsenic, iron	None	Chloride, potassium, arsenic, iron	None
G-08D1	10/14/20	Calcium, potassium, iron	Chloride, nitrite	Calcium, potassium, iron	Chloride, nitrite
G-09S	8/5/20	Alkalinity, bicarbonate, **pH**	Calcium, chloride, conductivity, magnesium, potassium, TDS, **barium**, **copper**	Alkalinity, bicarbonate, pH	Calcium, chloride, conductivity, magnesium, potassium, sodium, sulfate, TDS, barium, copper, manganese, selenium
G-09S	10/15/20	Alkalinity, bicarbonate, pH	Calcium, chloride, magnesium, potassium, **sulfate**, manganese, selenium		
G-10S	8/5/20	Ammonia, arsenic, iron	Calcium, chloride, magnesium, sulfate, manganese	Ammonia, arsenic, iron	Calcium, chloride, magnesium, sodium, sulfate, manganese
G-10S	10/15/20	None	Calcium, chloride, magnesium, sodium, manganese		
G-11S	10/14/20	**Calcium**, **magnesium**, manganese	Conductivity, sodium, sulfate	Calcium, magnesium, copper, manganese	Alkalinity, bicarbonate, conductivity, sodium, sulfate, TDS

Table 5 – Significant Trends, Shallow Wells 2020

Well	Date	Significant Trends			
		Second Semiannual 2020		2020 Overall	
		Increasing	Decreasing	Increasing	Decreasing
Upgradient Wells					
G-14S	10/14/20	pH, arsenic, **manganese**	**Chloride**, nitrate, sulfate	pH, arsenic, iron, manganese	Calcium, chloride, nitrate, sulfate, TDS
G-24S	10/14/20	None	Calcium, **chloride**, magnesium, barium	None	Calcium, chloride, magnesium, arsenic, barium

Constituents in **bold** (if any) indicate a new trend noted since the previous monitoring period

Decreasing trends in the shallow wells outnumbered increasing trends during all four 2020 sampling events, including the first quarter sampling event (*12 decreasing/5 increasing*), second quarter sampling event (31 decreasing/17 increasing), third quarter sampling event (*13 decreasing/6 increasing*), and fourth quarter sampling event (*25 decreasing/16 increasing*). Three increasing trends were noted in upgradient well G-14S during the second and fourth quarter events.

2.4.2 *Deep Groundwater Well Statistical Results*

Analytes that exceeded the calculated prediction limits in the deep zone wells and the observed concentration trends for the second semiannual 2020 events are summarized in ***Tables 6 and 7*** below and in ***Appendix B***. Plots of the deep zone groundwater statistical analyses are included in ***Appendix C***.

Table 6 – Summary of Annual 2020 Deep Well Prediction Limit Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Prediction Limit
Downgradient	G-01D	5/12/20	Chloride Conductivity Sodium	mg/L µmhos/cm mg/L	7.09 650 155	6.86 510 127.8505
		10/15/20	Chloride Conductivity pH Sodium	mg/L µmhos/cm std units mg/L	7.81 610 10.04 145	6.86 510 6.02-10.02 127.8505
	G-02D	5/13/20	None	--	--	--
		10/14/20	Nitrate	mg/L	0.42	0.21

Table 6 – Summary of Annual 2020 Deep Well Prediction Limit Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Prediction Limit
Downgradient	G-06B	5/12/20	Chloride	mg/L	7.18	6.86
			Conductivity	µmhos/cm	700	510
			Nitrate	mg/L	0.22	0.21
			Sodium	mg/L	168	127.8505
			TDS	mg/L	470	460
		10/14/20	Alkalinity	mg/L	290	280
			Chloride	mg/L	7.85	6.86
			Conductivity	µmhos/cm	710	510
			Nitrate	mg/L	0.24	0.21
			Sodium	mg/L	176	127.8505
	G-08D2	5/13/20	pH	std units	10.05	6.02-10.02
			Barium	mg/L	0.0066	0.0037
		10/14/20	Ammonia	mg/L	0.247	0.2403
	G-09D	1/7/20	Chloride	mg/L	21.2	9.4402
			Conductivity	µmhos/cm	840	510
			Sodium	mg/L	202	119
			Sulfate	mg/L	166	66.05
			TDS	mg/L	490	480
			Barium	mg/L	0.0075	0.0037
		5/12/20	Chloride	mg/L	10.4	6.86
			Conductivity	µmhos/cm	720	510
			Sodium	mg/L	181	127.8505
		8/5/20	Chloride	mg/L	9.83	6.86
			Conductivity	µmhos/cm	700	510
			Sodium	mg/L	177	127.8505
			Nickel	mg/L	0.091	0.006
		10/15/20	Chloride	mg/L	10.6	6.86
			Conductivity	µmhos/cm	730	510
			Sodium	mg/L	164	127.8505
	G-10D	1/7/20	Alkalinity	mg/L	510	280
			Bicarbonate	mg/L	510	280
			Calcium	mg/L	22.6	6.32
			Chloride	mg/L	19.1	9.4402
			Conductivity	µmhos/cm	1600	510
			Magnesium	mg/L	1.96	0.31
			Sodium	mg/L	348	119
			Sulfate	mg/L	317	66.05
			TDS	mg/L	1000	480
			Barium	mg/L	0.0112	0.0037
			Vanadium	mg/L	0.011	0.005

Table 6 – Summary of Annual 2020 Deep Well Prediction Limit Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Prediction Limit
Downgradient	G-10D	5/12/20	Alkalinity	mg/L	570	280
			Ammonia	mg/L	0.339	0.2403
			Bicarbonate	mg/L	570	280
			Calcium	mg/L	21.1	6.32
			Chloride	mg/L	16.7	6.86
			Conductivity	µmhos/cm	1500	510
			Sodium	mg/L	357	127.8505
			Sulfate	mg/L	298	230.291
			TDS	mg/L	990	460
			Zinc	mg/L	0.015	0.012
		8/5/20	Alkalinity	mg/L	530	280
			Ammonia	mg/L	0.312	0.2403
			Bicarbonate	mg/L	530	280
			Calcium	mg/L	21.8	6.32
			Chloride	mg/L	15.5	6.86
			Conductivity	µmhos/cm	1600	510
			Potassium	mg/L	2.08	1.6
			Sodium	mg/L	308	127.8505
			Sulfate	mg/L	274	230.291
			TDS	mg/L	1000	460
			Nickel	mg/L	0.189	0.006
		10/15/20	Alkalinity	mg/L	520	280
			Ammonia	mg/L	0.339	0.2403
			Bicarbonate	mg/L	520	280
			Calcium	mg/L	20.8	6.32
			Chloride	mg/L	16.3	6.86
			Conductivity	µmhos/cm	1600	510
			Potassium	mg/L	1.70	1.6
			Sodium	mg/L	325	127.8505
			Sulfate	mg/L	283	230.291
			TDS	mg/L	1100	460
	G-13D	5/12/20	Chloride	mg/L	25.7	6.86
			Zinc	mg/L	0.015	0.012
		10/15/20	Chloride	mg/L	14.1	6.86
			pH	std units	10.13	6.02-10.02
Upgradient	G-14D	5/13/20	None	--	--	--
		10/14/20	None	--	--	--
	G-24D	5/13/20	None	--	--	--
		10/14/20	Ammonia	mg/L	0.253	0.2403
			Conductivity	µmhos/cm	530	510
			Sodium	mg/L	138	127.8505

The trends noted during the first semiannual event are summarized in ***Table 7*** below and in ***Appendix B***. Decreasing trends in the deep wells outnumbered increasing trends during all four 2020 sampling events, including the first quarter sampling event (*6 decreasing/2 increasing*), second quarter event (*26 decreasing/13 increasing*), third quarter sampling event (*14 decreasing/6 increasing*), and fourth quarter sampling event (*25 decreasing/9 increasing*).

Three of the increasing trends were noted in upgradient wells G-14D and G-24D during the fourth quarter event.

Table 7 – Significant Trends, Deep Wells 2020

Well	Date	Significant Trends			
		Second Semiannual 2020		2020 Overall	
		Increasing	Decreasing	Increasing	Decreasing
Downgradient Wells					
G-01D	10/15/20	pH	**Bicarbonate**, chloride, **sulfate**, **TDS**	pH, Potassium	Bicarbonate, chloride, sulfate, TDS
G-02D	10/14/20	Iron	Calcium, chloride, conductivity, nitrate, sodium, TDS	Iron	Calcium, chloride, conductivity, nitrate, sodium, TDS
G-06B	10/14/20	Arsenic	Chloride, sulfate, TDS	Potassium, arsenic	Calcium, chloride, conductivity, nitrate, sodium, sulfate, TDS
G-08D2	10/14/20	**Arsenic**	Chloride	Calcium, potassium, arsenic, iron	Chloride
G-09D	8/5/20	**Ammonia**	**Calcium**, nitrate, lead	Ammonia, iron	Calcium, nitrate, arsenic, lead
	10/15/20	Ammonia, **iron**	**Nitrate**, **arsenic**, lead		
G-10D	8/5/20	Iron	Calcium, chloride, magnesium, **sulfate**, manganese	Iron	Calcium, chloride, magnesium, sulfate, manganese
	10/15/20	None	Calcium, chloride, magnesium, manganese		
G-13D	10/15/20	**pH**, **manganese**	Ammonia, sulfate	pH, manganese	Ammonia, sulfate
Upgradient Wells					
G-14D	10/14/20	None	**Chloride**, sulfate	Calcium, iron	Ammonia, chloride, sulfate

Table 7 – Significant Trends, Deep Wells 2020

Well	Date	Significant Trends			
		Second Semiannual 2020		2020 Overall	
		Increasing	Decreasing	Increasing	Decreasing
G-24D	10/14/20	pH	Chloride	pH	Chloride

Constituents in **bold** indicate a new trend noted since the previous monitoring period

3.0 SURFACE WATER MONITORING

Snohomish County performed surface water sampling during the second half of 2020 as required by the landfill permit and consistent with the **SAP** and approved Application of Variance. Although the surface water sampling frequency was reduced to semiannual, surface water samples were inadvertently collected during both the first and second quarters of 2020.

3.1 SURFACE WATER SAMPLING

Snohomish County field personnel collected surface water samples from five locations on January 21, 2020 and from four locations on April 30, and October 20, 2020 in accordance with the **SAP** procedures. Although the SAP specifies semiannual sampling of surface water, samples were inadvertently collected twice during the first half of 2020. The 2020 surface water analytical results were compared to applicable criteria in **Chapter 173-201A WAC** as summarized ***Table 8*** below.

Table 8 – Second Semiannual 2020 Surface Water Analytical Results

Parameter	Units	Criteria	CC-A1	CC-B1	CC-D	CC-F	CC-NSDP
Date	--	--	1/21/20	1/21/20	1/21/20	1/21/20	1/21/20
Coliform	(CFU/100 mL)	200	160	16	8	100	<2
Conductivity	µmhos/cm	--	130	140	130	140	140
Nitrate N	mg/L	--	2.4	2.1	0.24	2.1	0.42
pH	std units	5.5-6.5	6.66	6.65	5.95	6.84	5.88
Parameter	**Units**	**Criteria**	**CC-A1**	**CC-B1**	**CC-D**	**CC-F**	**CC-NSDP**
Date	--	--	4/30/20	4/30/20	NS	4/30/20	4/30/20
Coliform	(CFU/100 mL)	200	54	4	--	14	<2
Conductivity	µmhos/cm	--	120	140	--	140	150
Nitrate N	mg/L	--	0.35	0.35	--	0.29	<0.01
pH	std units	5.5-6.5	6.71	6.54	--	6.94	6.57
Parameter	**Units**	**Criteria**	**CC-A1**	**CC-B1**	**CC-D**	**CC-F**	**CC-NSDP**
Date	--	--	10/20/20	10/20/20	NS	10/20/20	10/20/20
Coliform	(CFU/100 mL)	200	61	100	--	26	5
Conductivity	µmhos/cm	--	130	130	--	160	210
Nitrate N	mg/L	--	0.46	0.35	--	0.48	1.2
pH	std units	5.5-6.5	6.74	6.71	--	6.92	6.45

NS = Not sampled - location dry; ND = not detected above the indicated detection limit

Ten of the 13 pH concentrations detected during the 2020 surface water sampling events slightly exceeded the surface water quality criteria. None of the fecal coliform concentrations exceeded the surface water quality criteria during the 2020 surface water sampling events.

4.0 LANDFILL GAS MONITORING

During the second semiannual sampling events, landfill gas readings were collected from eight gas probes in accordance with the SAP (Landau 2006) on September 23 and December 18, 2020. Landfill gas readings were also collected from seven vaults, six barhole probes, and two lift station vaults on those dates. The 2020 landfill gas monitoring results are summarized in separate quarterly letter reports to SHD and on the field sheets in ***Appendix D***.

As shown on the field sheets, no detectable methane concentrations were detected from any of the monitoring points during 2020.

5.0 LEACHATE MONITORING

Cathcart Sanitary Landfill is authorized under City of Everett Industrial Waste Discharge Permit #7701-17 to discharge pretreated industrial wastewater (landfill leachate and vactor liquid wastes) to the City of Everett sewer system via connection through the Silver Lake Water and Sewage District sewer.

As shown on the pretreatment system flow diagram (Figure 7), landfill leachate and condensate drains to a pump station (designated SP-1), from which the leachate and condensate are pumped to a grit chamber and combined with groundwater from the landfill underdrain system to pump station SP-1. The combined leachate and groundwater is then pumped through a flow meter vault (designated P-FV-2), where the total daily flow is measured using an electromagnetic flow meter (mag meter). The flow is then discharged into either of two pretreatment lagoons. The lagoons are constructed of concrete equipped with underdrain systems that are connected to leak detection vaults (designated P-MH-3 and P-MH-4), which are monitored monthly for the presence of liquid, which could indicate a leak from the lagoons. A total of 16 manholes and vaults within the leachate collection system are monitored monthly for the presence of excess sediment (or fluid, in the case of leak detection vaults) and maintenance issues. The completed inspection forms are included in ***Appendix D***. No fluid was observed in either of the leak detection vaults during 2020.

The maximum design capacity of each lagoon is approximately 2.5 million gallons. Combined leachate and vactor liquid is treated in one or both of the leachate collection lagoons by settlement and aeration. Each lagoon has two aerators installed, which operate hourly for 15 minutes. The aerated liquid is then routed via a sampling vault (P-MH-9) to a discharge point to the sewer. Liquid samples are collected from P-MH-9 on a monthly basis and the results are summarized in a monthly report, which is submitted to the City of Everett per the IWDP permit.

During 2020, a total of 2,349,000 gallons of landfill leachate were pumped to the pretreatment lagoons for treatment and eventual discharge to the sewer. Leachate was pumped to the pretreatment lagoons at an average rate of 195,750 gallons per month, which varied from 51,100 gallons in September to 452,800 gallons in December. Overall, the rate of leachate production and flow correlates with seasonal rainfall totals. The leachate flow totals are included in ***Table 9*** below.

Table 9 – Cathcart Landfill Leachate Flow Totals, 2020

Month	Total (gallons)
January	312,800
February	346,400
March	146,900
April	77,700
May	83,100
June	403,800
July	90,400
August	51,800
September	51,100
October	102,100
November	230,100
December	452,800
Maximum:	51,100
Minimum:	452,800
Monthly Average:	195,750
2020 Total:	**2,349,000**

5.1 LEACHATE SAMPLING

On January 7, 2020, Snohomish County Solid Waste personnel collected annual samples from the leachate pump station vaults designated SP-1 and SP-4 to characterize leachate from above (SP-1) and below (SP-4) the landfill liner. The leachate samples were analyzed for the following constituents:

- pH by USEPA Method 150.2
- Biological oxygen demand (BOD) by Method SM 5210B
- Conductivity by Method SM 2510B
- Total cyanide by USEPA Method 335.4
- Oil and Grease (HEM) by USEPA Method 1664 HEM
- Total Petroleum Hydrocarbons (Polar/Non-Polar) by USEPA Method 1664 SGT-HEM
- Total Suspended Solids (TSS) by Method SM 2540D
- Flashpoint by USEPA Method 1020
- Metals by USEPA Method 200.7/245.1, including:
    - Arsenic
    - Cadmium
    - Chromium
    - Copper
    - Mercury
    - Lead

- Nickel
- Silver
- Zinc

In addition, the sample from vault SP-1 was analyzed for the standard groundwater constituent suite and priority pollutants, which included:

- Total Phenol by EPA Method 420.4
- Metals by USEPA Methods 200.8/245.1, including the above-listed metals and:
  - Antimony
  - Beryllium
  - Selenium
  - Thallium
- VOCs by USEPA Method 8260/8260 SIM/624
- Semivolatile Organic Compounds (*SVOCs*) by USEPA Method 625/625-SIM
- Polynuclear Aromatic Hydrocarbons (*PAHs*) by USEPA Method 625-SIM
- Organochlorine Pesticides (*OCPs*) by USEPA Method 608
- Polychlorinated Biphenyls (*PCBs*) by USEPA Method 608

Tabulated summaries of the leachate vault sample analytical results are included below as Tables 10 and 11. Only constituents that were detected are shown in the tables; none of the leachate vault samples collected during the current monitoring year contained detectable concentrations of VOCs, SVOCs, PAHs, OPPs, or PCBs.

Table 10 – Leachate Vault Results – Inorganics

Location ID	Date	pH	BOD	Conductivity	Oil & Grease	TSS
Units		std. units	mg/L	µmhos/cm	mg/L	mg/L
SP-1	1/7/20	6.21	19	580	6.7	8.0
SP-4	1/7/20	5.98	220	480	7.4	7.0

Table 11 – Leachate Vault Results – Metals

Location ID	Date	Arsenic	Barium	Chromium	Iron	Manganese	Nickel	Selenium	Zinc
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
SP-1	1/7/20	17.4	31.5	ND<5	4980	893	7	0.31	ND<5
SP-4	1/7/20	25.8	--	5.3	--	--	7	--	24.1

-- = not analyzed; ND = Not detected at the indicated detection limit

6.0 SUMMARY AND RECOMMENDATIONS

6.1 SUMMARY

The groundwater, surface water, leachate, and landfill gas monitoring data collected during the 2020 monitoring events indicate the following:

- The groundwater elevations, flow direction, and gradient measured during the 2020 semiannual monitoring events were generally consistent with those measured historically at the site.

- The most common groundwater standard exceedances were pH, sodium, and arsenic, which is consistent with historical site data.
- The majority of statistical limit exceedances in the shallow zone were noted in wells G-04A, G-09S and G-10S, which is consistent with recent historical data. No statistical exceedances were noted in shallow wells G-01A and G-11S during the 2020 monitoring events.
- Overall, significantly more decreasing trends were noted in both zones during all four monitoring events (*81 decreasing/44 increasing trends in the shallow zone, and 71 decreasing/30 increasing trends in the deep zone*).
- Forty-six of the 52 decreasing concentration trends noted in the deep zone during the second and fourth quarters occurred in downgradient wells; three of the increasing trends noted during the second quarter and one of the increasing trends noted during the fourth quarter occurred in upgradient wells G-14D and G-24D.
- Low concentrations of vinyl chloride were detected in the third quarter sample from shallow well G-09S, and deep well G-09D during all four 2020 sampling events. These detections are consistent with recent results at these wells. The methylene chloride concentrations noted in wells G-09S, G-09D, G-10S, and G-10D during the third quarter 2020 monitoring event appear to represent contamination imparted during analysis and not actual groundwater impacts.
- Slight exceedances of the surface water quality goals for pH were noted in 11 of the 13 surface water samples collected during 2020. None of the surface water fecal coliform concentrations exceeded the quality goal of 200 CFU/100 mL.
- The monitoring results at the perimeter gas probe locations did not indicate the presence of detectable concentrations of landfill gas during 2020.
- Landfill settlement surveys were discontinued in 2019 after six years of annual measurements. During the previous six years, no significant settlement was noted across the landfill mass that exceeded tolerance levels established in the Department of Ecology's Uniform Guidance document.

6.2 CONCLUSIONS/RECOMMENDATIONS

- The groundwater elevation data and fluctuations with seasonal rainfall totals (*as shown on the hydrographs in* ***Appendix A***) suggest that the shallow and deep groundwater zones are hydraulically continuous and may in fact represent one complex water-bearing zone.
- There is no indication of groundwater impacts extending beyond the site boundaries of the Cathcart Landfill.
- The analytical data indicate that there is likely a leachate impact in monitoring wells G-09S, G-09D, G-10S, and G-10D.
- In accordance with the SAP and the approved variance, Snohomish County Solid Waste will continue to monitor groundwater and surface water semiannually.
- Following installation of new landfill gas probe GP-6 adjacent to residences northwest of the landfill, landfill gas will continue to be monitored quarterly until the stratigraphy and

hydrogeology of the site are evaluated for landfill gas migration potential and the data from GP-6 confirms that landfill gas is not migrating near the northwest perimeter of the landfill.

- The SAP is in the process of being updated to better reflect existing landfill conditions and revised monitoring frequency and conditions detailed in the approved variance.

6.3 MONITORING REDUCTION REQUEST

Contingent on Ecology and SHD approval, the groundwater monitoring frequency at wells G-09S, G-09D, G-10S, and G-10D will be reduced to semiannual during 2021. Consistent with the approved Variance, these wells were monitored on a quarterly basis for a minimum of eight quarters from the resumption of sampling at those wells in the second quarter of 2018 (*i.e., through second quarter of 2020*), plus three additional quarters.

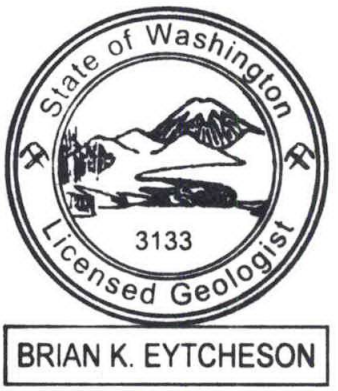
Based on the results of the last 11 quarters of sampling, the significant concentration trends in these wells over the past three years were mostly decreasing, and the overall constituent concentrations were lower in these wells during the last 11 quarters than during monitoring events performed prior to 2013, when sampling from wells G-09S, G-09D, and G-10S was temporarily suspended until 2018 (***Appendix C***).

In addition, vinyl chloride is the most consistently detected VOC in wells G-09S, G-09D, G-10S, and G-10D following the resumption of sampling in 2018. From 2018 to 2020, vinyl chloride was not detected in well G-10S; was detected once in well G-10D; and was detected three times in well G-09S. Only well G-09D contained detectable concentrations of vinyl chloride consistently (*in eight of the last 12 samples*). The vinyl chloride concentrations in well G-09D have been variable since sampling was resumed at that well, and have ranged from 0.09 µg/L to 0.81 µg/L since 2018. A weak increasing trend in vinyl chloride concentrations is evident between 2018 and the fourth quarter of 2020, as shown on the graph in Appendix E. However, if the non-detectable vinyl chloride concentration in well G-09D during the first quarter of 2021 is included in the dataset, a weak decreasing trend in vinyl chloride concentrations in well G-09D is evident (*Appendix E*).

Given the decreasing trends noted in wells G-09S, G-09D, and G-10S during quarterly sampling, the overall lack of vinyl chloride concentrations in wells G-09S, G-10S, and G-10D, and the low concentrations of vinyl chloride detected in G-09D, Snohomish County respectfully requests that the monitoring frequency in wells G-09S, G-09D, G-10S, and G-10D be reduced to semiannual, consistent with the monitoring frequency of the remainder of the groundwater monitoring network at Cathcart Landfill.

Brian K. Eytcheson, LG
SCPW – Solid Waste Division

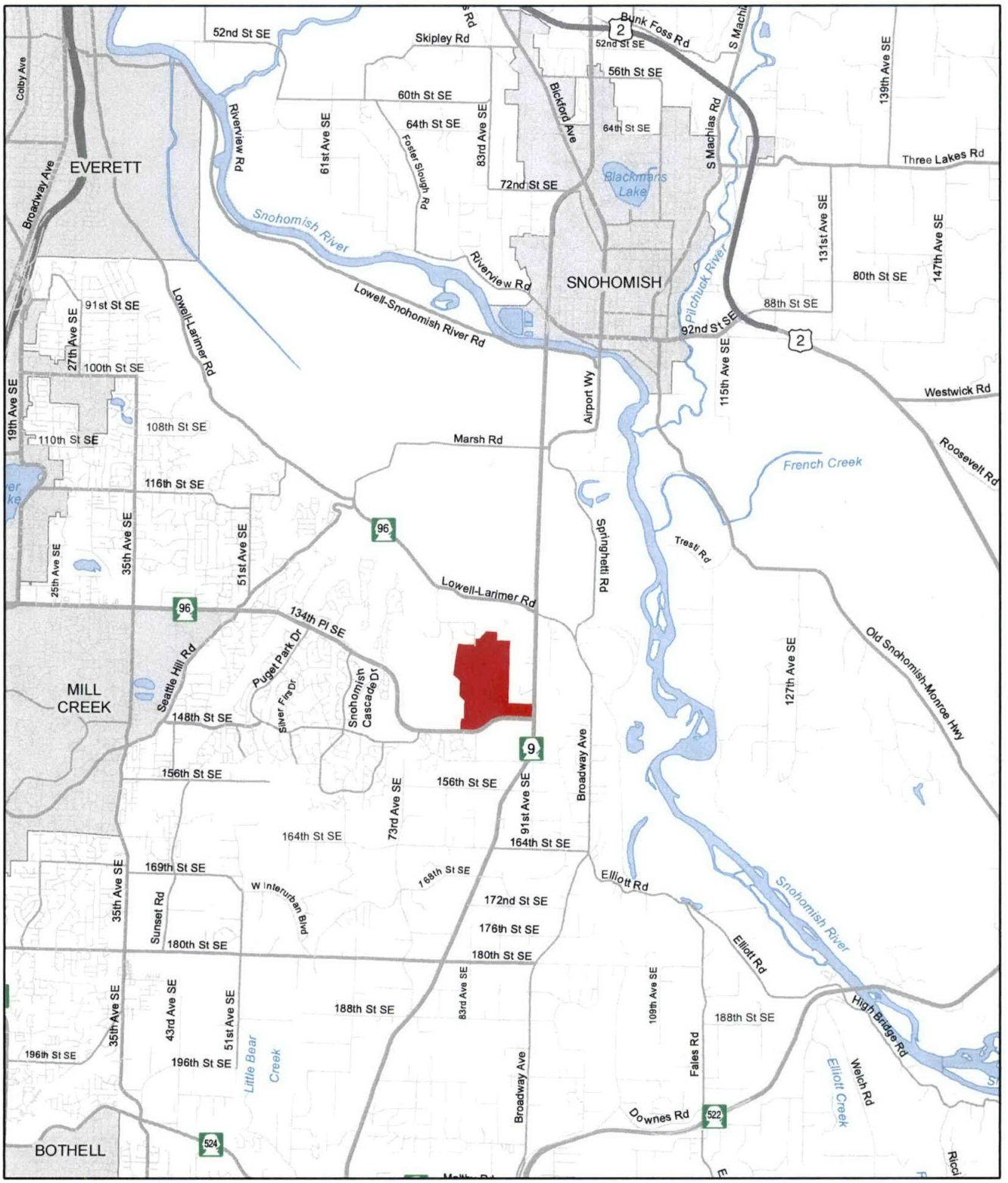
2/9/21
Date



Figures

Figure 1

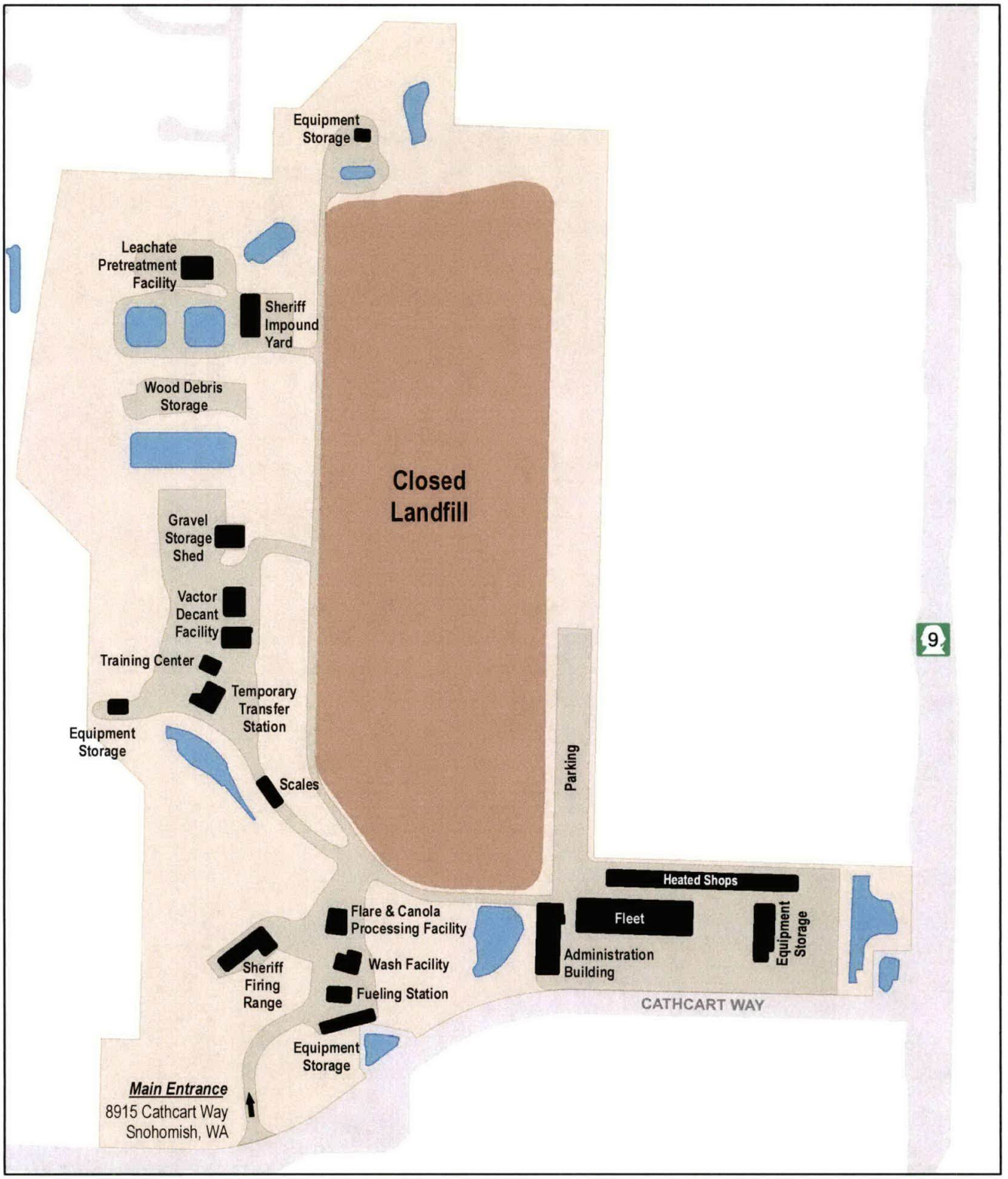
Cathcart Landfill Vicinity Map



Snohomish County
Public Works
Solid Waste Division
March 16, 2010

Figure 2

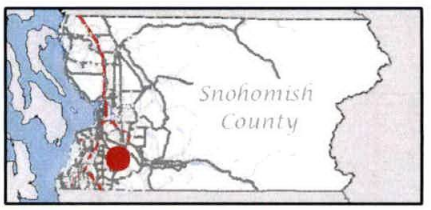
Cathcart Landfill Site Map



0 0.045 0.09 0.18 Miles

0 180 360 720 1,080 Feet

N W E S



Snohomish County
Public Works
Solid Waste Division
March 16, 2010

Figure 3

Cathcart Landfill

Topography

Map Features

- Parcel Boundary
- Subject Property Boundary
- 5 Foot Contours

N

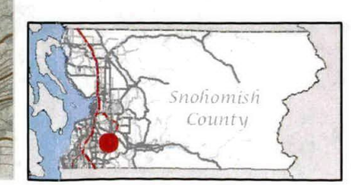
W

E

S

1 inch = 350 feet

0	0.02	0.04	0.08	0.12	0.16	0.2	Miles
0	137.5	275	550	825	1,100		Feet

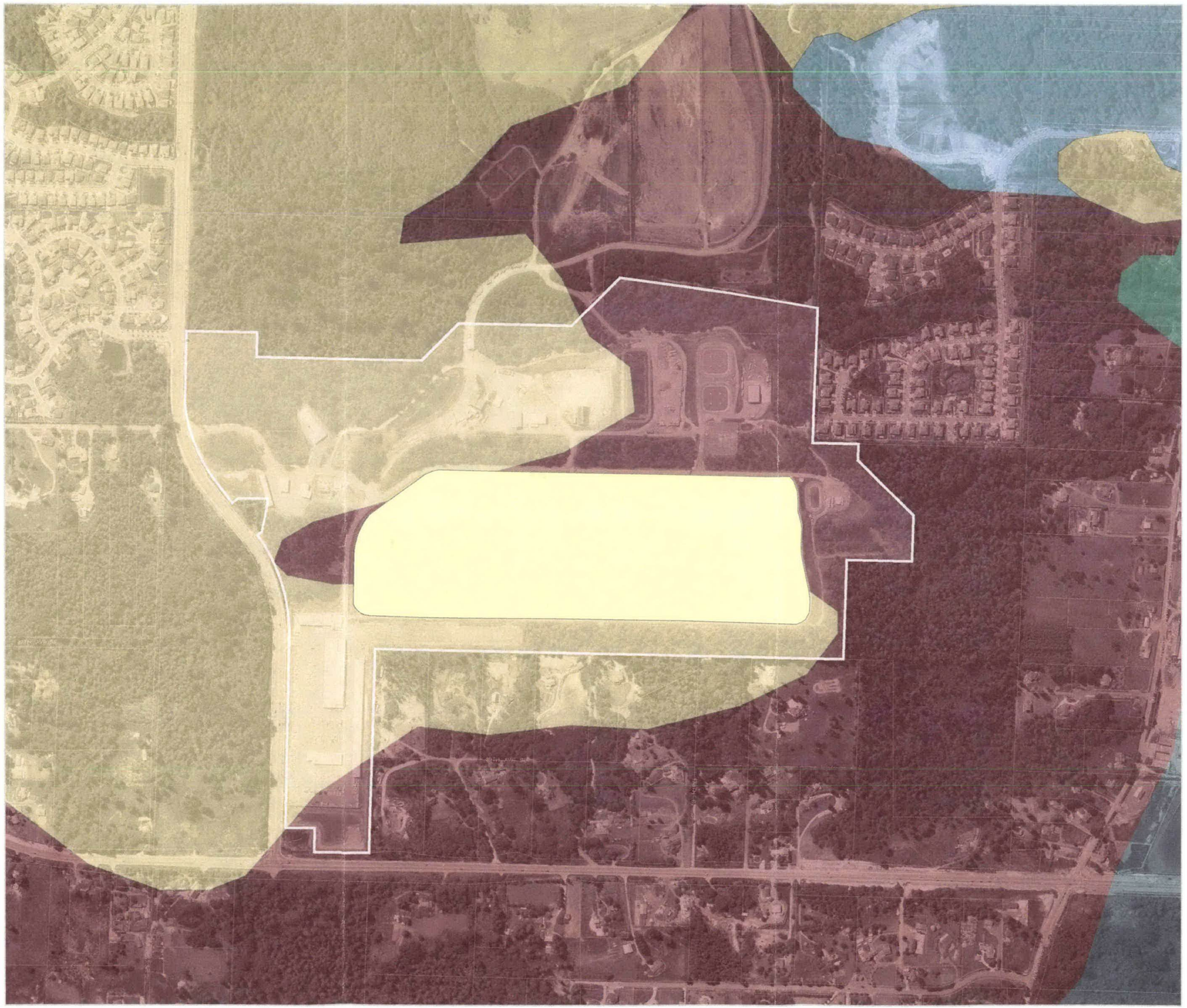


Snohomish County
Public Works
Solid Waste Division
March 24, 2010

Figure 4

Cathcart Landfill

Geologic Map



Map Features

Parcel Boundary

Subject Property Boundary

Geologic Description

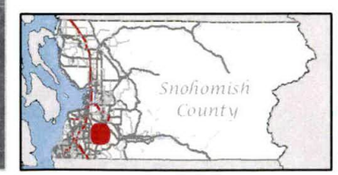
- Recent Alluvium (Qyal)
- Vashon Recessional Outwash (Qvr)
- Vashon Glacial Till (Qvt)
- Vashon Advance Outwash (Qva)
- Transitional Beds (Qtb)
- Modified Land

W S N E

1 inch = 600 feet

0 0.035 0.07 0.14 0.21 0.28 0.35 Miles

0 240 480 960 1,440 1,920 Feet



Snohomish County
Public Works
Solid Waste Division
June 8, 2010

Figure 5

Cathcart Landfill

Monitoring Network

Map Features

- Parcel Boundary
- Subject Property Boundary

Aquifer Unit (Active Wells)

- Deep Aquifer
- Shallow Aquifer

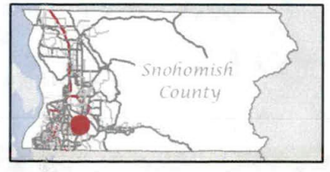
Inactive / Removed Wells

- Abandoned / Decommissioned
- Inactive

Additional Sampling Points

- Gas Probe
- Surface Water Sample Locations

0 125 250 500 750 1,000 Feet



N

Snohomish County
Public Works
Solid Waste Division
November 12, 2019

Document Path: I:\pw\swaste\projects\Groundwater\Cathcart Monitoring\2019\ArcMaps\Cathcart_Monitoring_Network_Figure_5.mxd

Figure 5a

Cathcart Landfill

Monitoring Network

Map Features

- Parcel Boundary
- Subject Property Boundary

Aquifer Unit (Active Wells)

- Deep Aquifer
- Shallow Aquifer

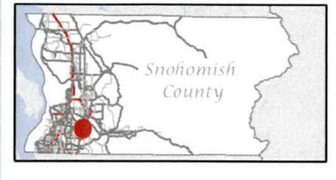
Inactive / Removed Wells

- Abandoned / Decommissioned
- Inactive

Additional Sampling Points

- Gas Probe
- Water Sample Locations

0 37.5 75 150 225 300 Feet



N

Snohomish County
Public Works
Solid Waste Division
November 12, 2019

Document Path: I:\pw\swaste\projects\Groundwater\Cathcart Monitoring\2019\ArcMaps\Cathcart_Monitoring_Network_Figure_5a.mxd

Figure 6a

Cathcart Landfill

Shallow Aquifer Groundwater Elevation Contours Second Quarter 2020

DIRECTION OF GROUNDWATER FLOW
0.00037 ft / day
0.13 ft / year
124.46 degrees to the positive x - axis

PARCEL BOUNDARY

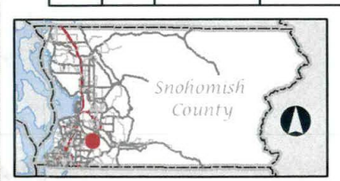
SUBJECT PROPERTY BOUNDARY

5 FT CONTOUR

WELL LOCATION

WELL_ID	SAMP_DATE	MEAS_HEAD
G-01A	5/12/2020	218.67
G-04A	5/12/2020	273.01
G-08D1	5/12/2020	198.79
G-09S	5/12/2020	243.08
G-10S	5/12/2020	243.63
G-11S	5/12/2020	231.13
G-14S	5/12/2020	319.25
G-24S	5/12/2020	307.33

0 125 250 500 750 1,000
Feet



N

Snohomish County
Public Works
Solid Waste Division
Date: 7/28/2020

Document Path: I:\gw\swaste\projects\Groundwater\Cathcart\2020\ArcMap\CathcartWaterElevationContours_Shallow.mxd

Figure 6b

Cathcart Landfill

Deep Aquifer Groundwater Elevation Contours Second Quarter 2020

DIRECTION OF GROUNDWATER FLOW
0.0120 ft / day
4.25 ft / year
138.92 degrees to the positive x - axis

PARCEL BOUNDARY

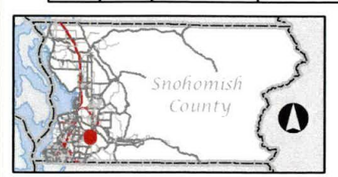
SUBJECT PROPERTY BOUNDARY

5 FT CONTOUR

WELL LOCATION

WELL_ID	SAMP_DATE	MEAS_HEAD
G-01D	5/12/2020	205.81
G-02D	5/12/2020	211.90
G-06B	5/12/2020	211.44
G-08D2	5/12/2020	216.19
G-09D	5/12/2020	223.86
G-10D	5/12/2020	237.47
G-13D	5/12/2020	220.90
G-14D	5/12/2020	298.88
G-24D	5/12/2020	301.26

0 125 250 500 750 1,000
Feet



N

Snohomish County
Public Works
Solid Waste Division
Date: 7/28/2020

Document Path: I:\pw\swaste\projects\Groundwater\Cathcart\2020\ArcMap\CathcartWaterElevationContours_Deep.mxd

Figure 6c

Cathcart Landfill

Shallow Aquifer Groundwater Elevation Contours Fourth Quarter 2020

DIRECTION OF GROUNDWATER FLOW
0.000349 ft / day
0.130 ft / year
120.07 degrees to the positive x - axis

PARCEL BOUNDARY

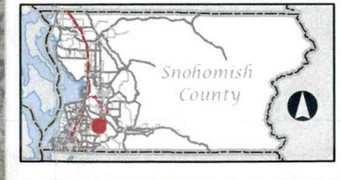
SUBJECT PROPERTY BOUNDARY

5 FT CONTOUR

WELL LOCATION

WELL_ID	SAMP_DATE	MEAS_HEAD
G-01A	10/14/2020	220.70
G-04A	10/14/2020	271.81
G-08D1	10/14/2020	197.60
G-09S	10/14/2020	241.57
G-10S	10/14/2020	242.52
G-11S	10/14/2020	232.76
G-14S	10/14/2020	315.09
G-24S	10/14/2020	306.86

0 125 250 500 750 1,000
Feet



N

Snohomish County
Public Works
Solid Waste Division
Date: 12/4/2020

Document Path: I:\pw\swaste\projects\Groundwater\Cathcart\2020\ArcMap\CathcartWaterElevationContours_Shallow.mxd

Figure 6d

Cathcart Landfill

Deep Aquifer Groundwater Elevation Contours Fourth Quarter 2020

DIRECTION OF GROUNDWATER FLOW
0.0110 ft / day
4.02 ft / year
134.74 degrees to the positive x - axis

PARCEL BOUNDARY

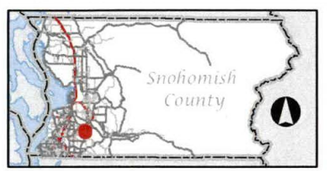
SUBJECT PROPERTY BOUNDARY

5 FT CONTOUR

WELL LOCATION

WELL_ID	SAMP_DATE	MEAS_HEAD
G-01D	10/14/2020	206.62
G-02D	10/14/2020	211.29
G-06B	10/14/2020	211.92
G-08D2	10/14/2020	212.42
G-09D	10/14/2020	222.61
G-10D	10/14/2020	237.38
G-13D	10/14/2020	221.69
G-14D	10/14/2020	297.97
G-24D	10/14/2020	301.07

0 125 250 500 750 1,000
Feet



Snohomish County
Public Works
Solid Waste Division
Date: 12/4/2020

Document Path: I:\pw\swaste\projects\Groundwater\Cathcart\2020\ArcMap\CathcartWaterElevationContours_Deep.mxd

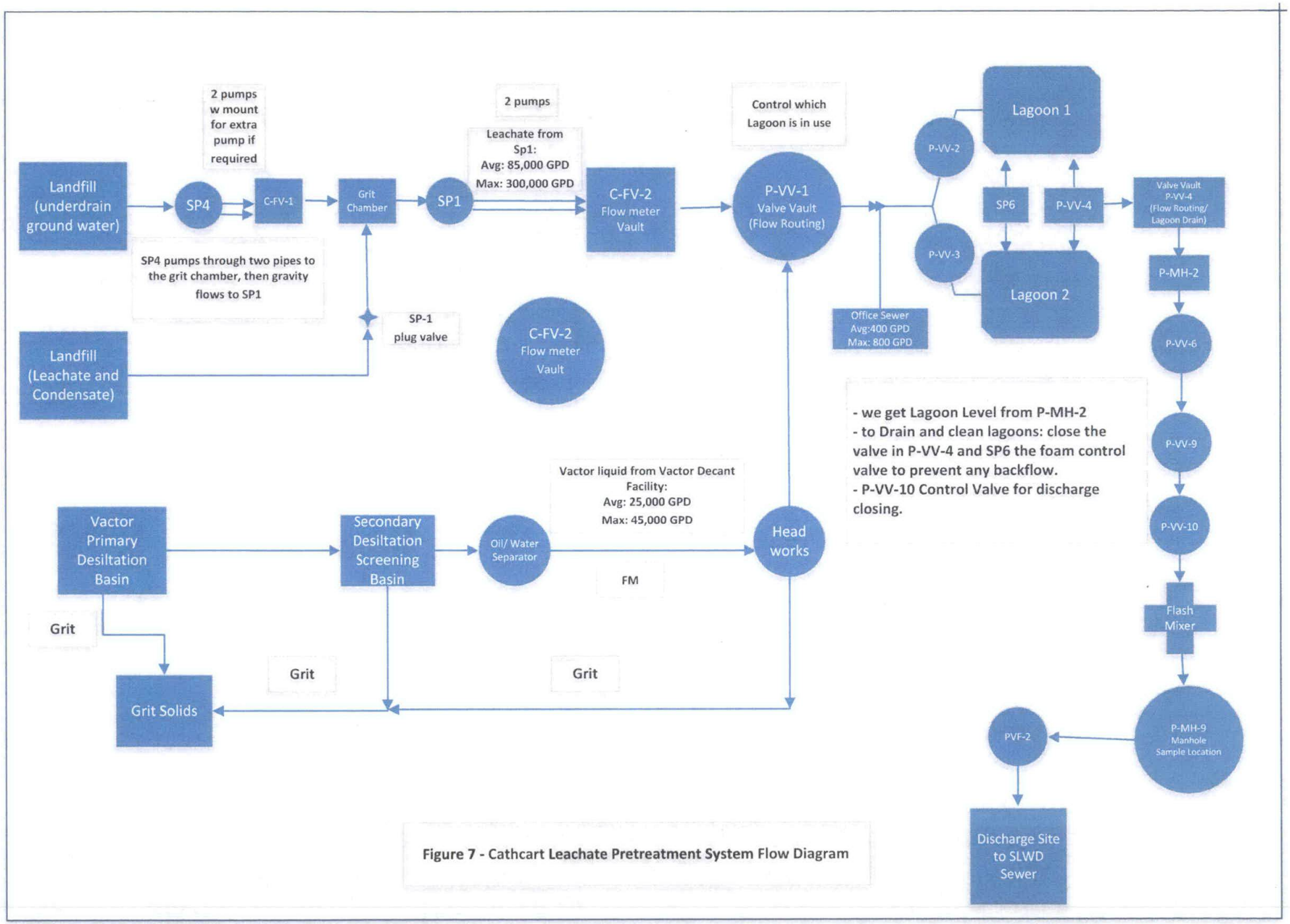


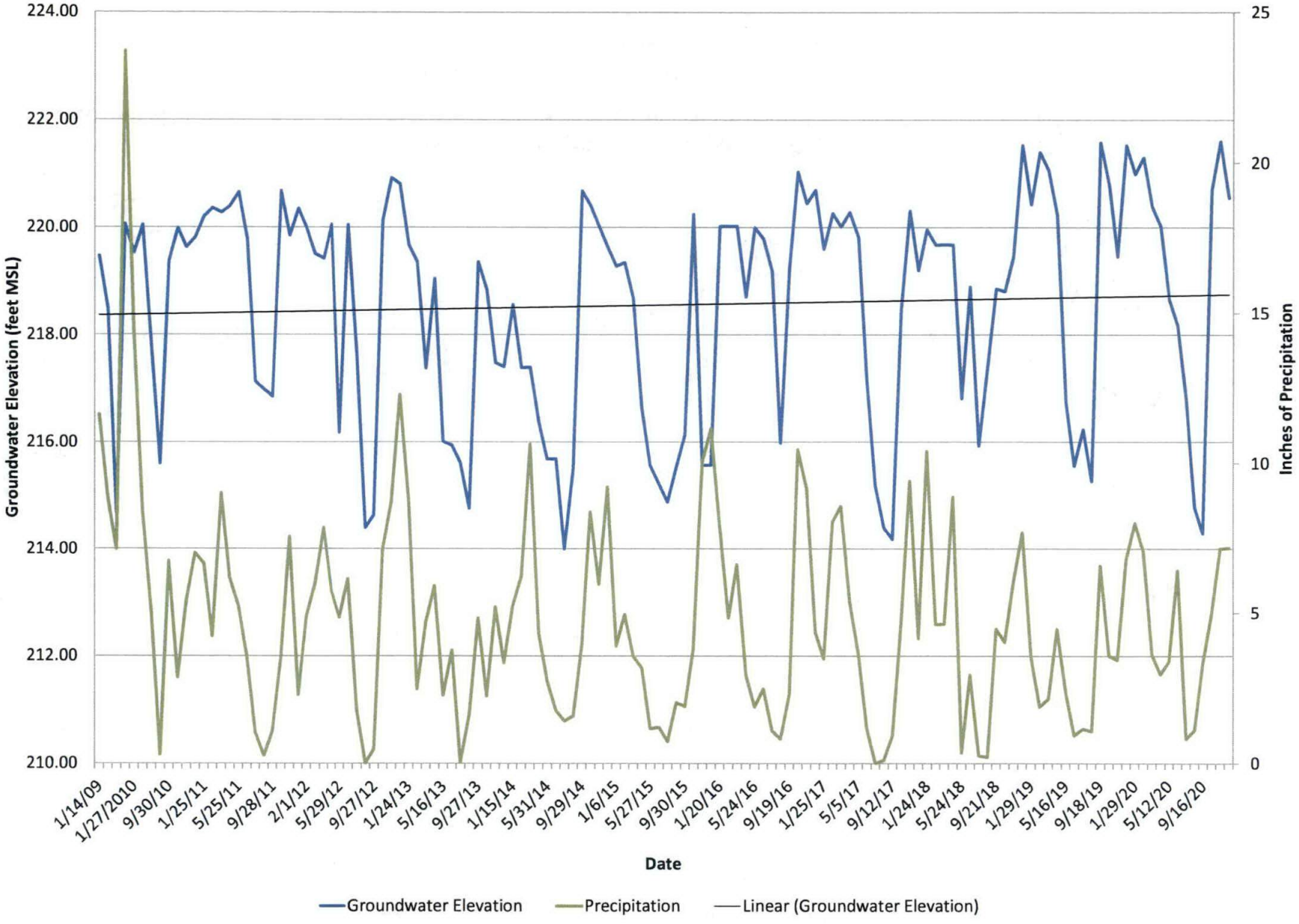
Figure 7 - Cathcart Leachate Pretreatment System Flow Diagram

Appendix A

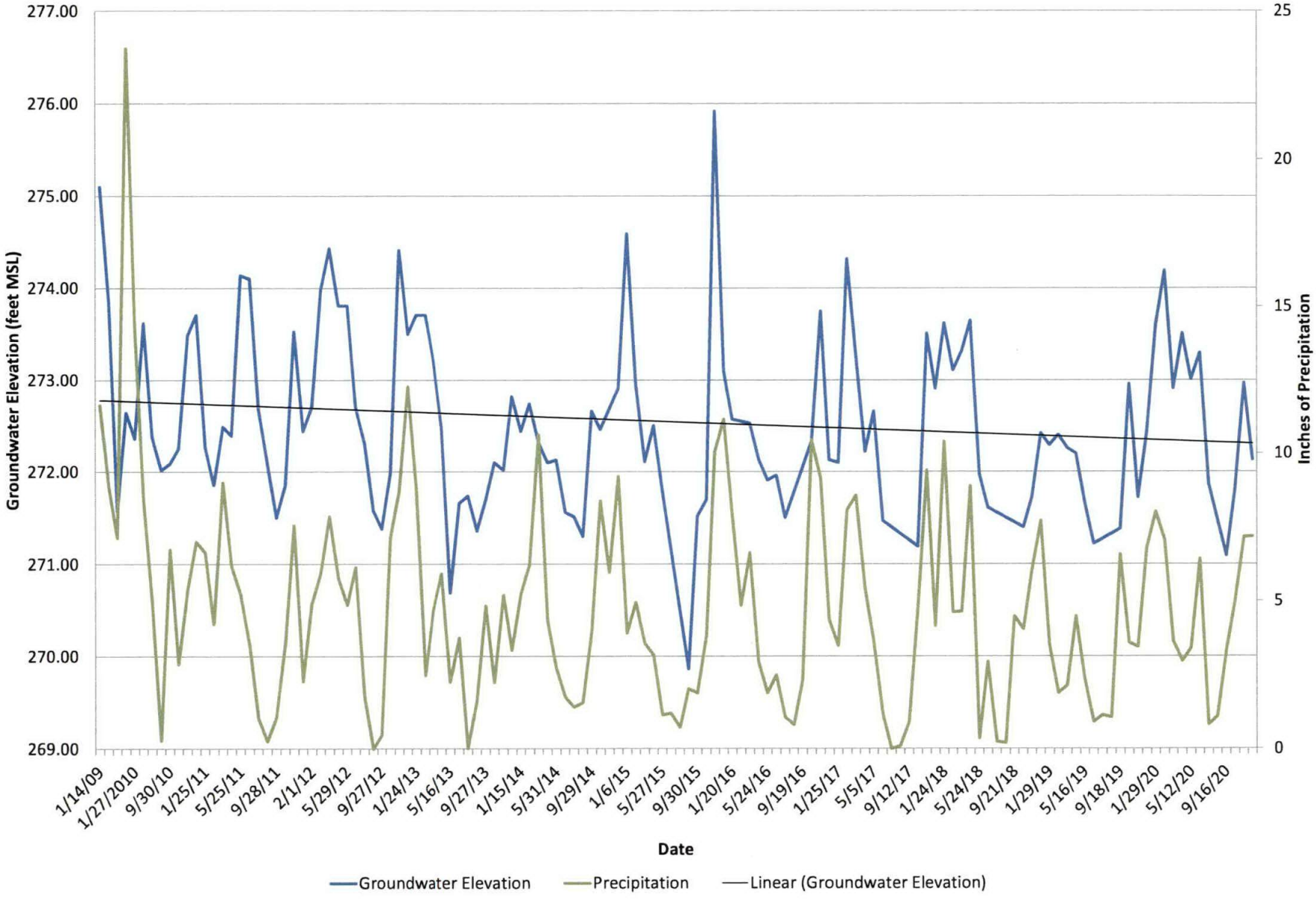
Hydrographs

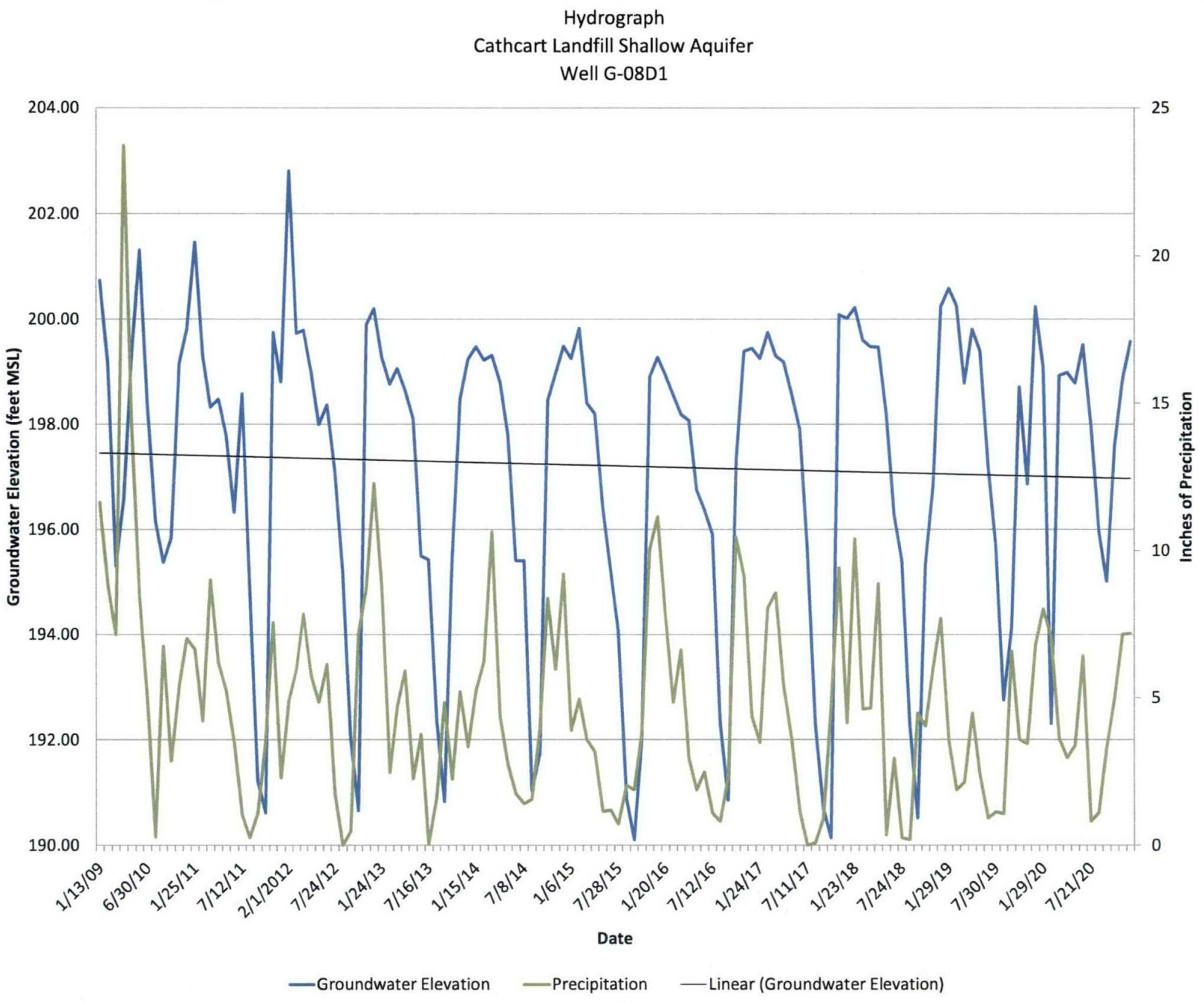
Shallow Wells

Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-01A

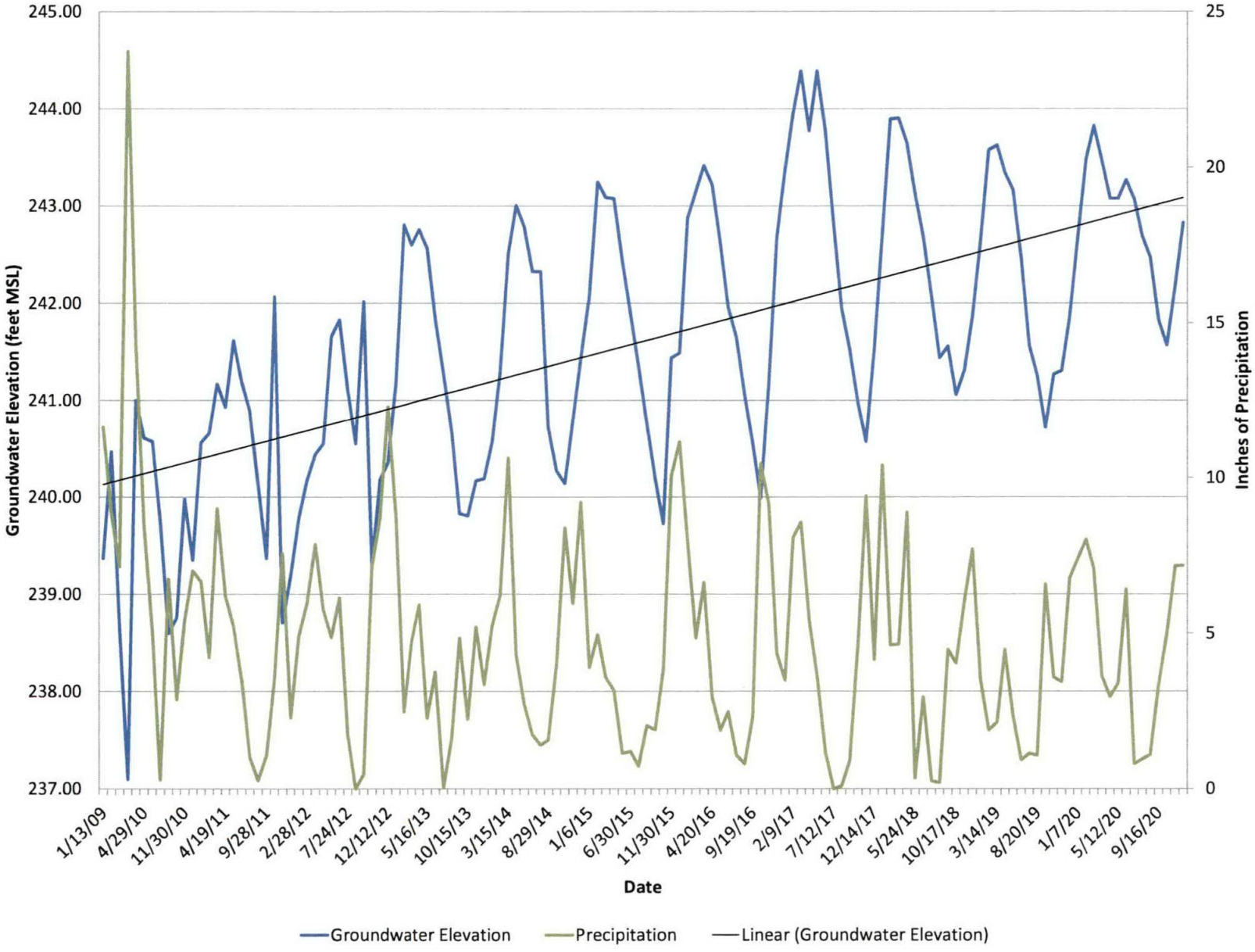


Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-04A

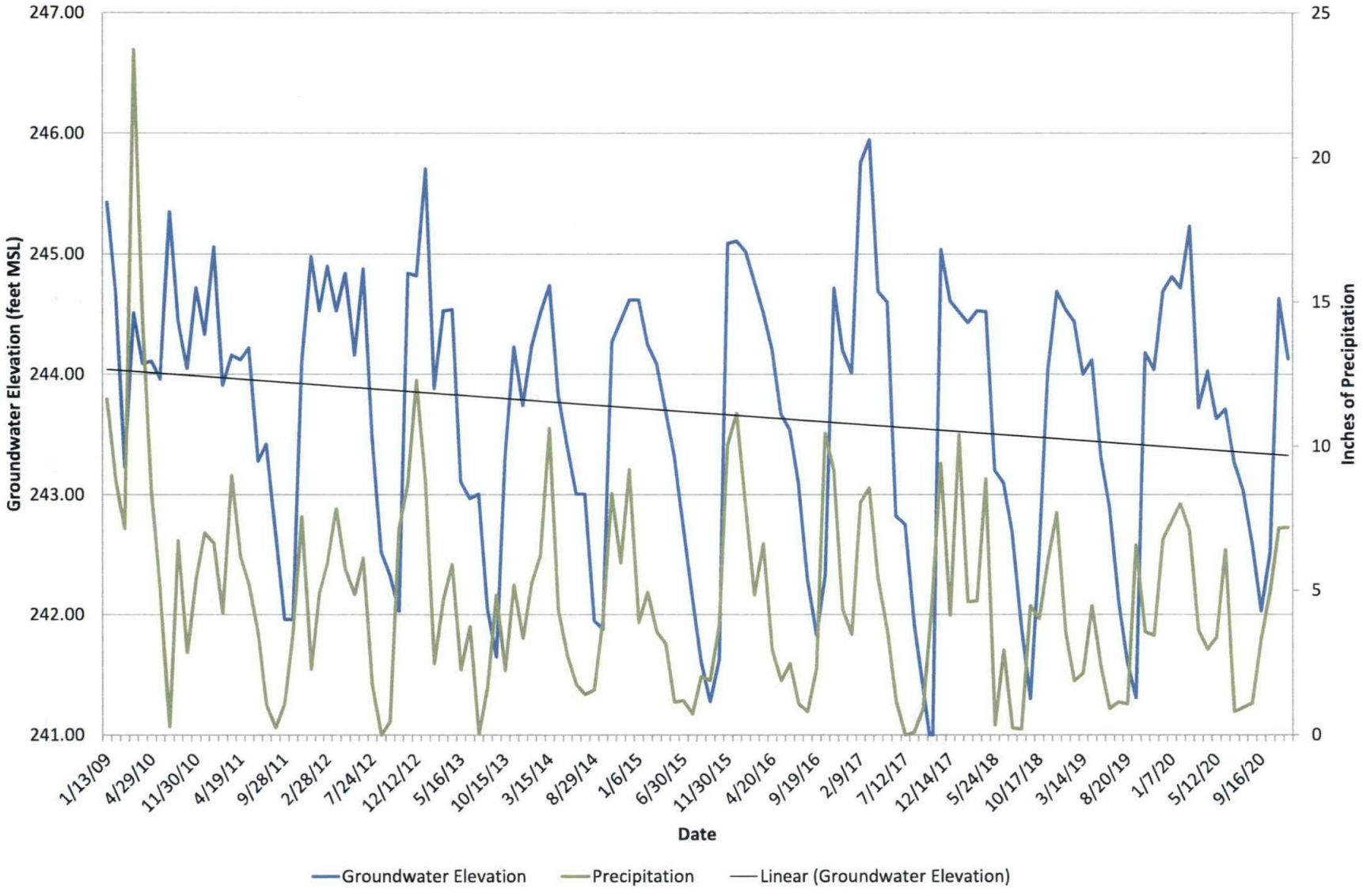



Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-08D1
Groundwater Elevation (feet MSL)
Inches of Precipitation
204.00
202.00
200.00
198.00
196.00
194.00
192.00
190.00
25
20
15
10
5
0
1/13/09
6/30/10
1/25/11
7/12/11
2/1/2012
7/24/12
1/24/13
7/16/13
1/15/14
7/8/14
1/6/15
7/28/15
1/20/16
7/12/16
1/24/17
7/11/17
1/23/18
7/24/18
1/29/19
7/30/19
1/29/20
7/21/20
Date
Groundwater Elevation
Precipitation
Linear (Groundwater Elevation)

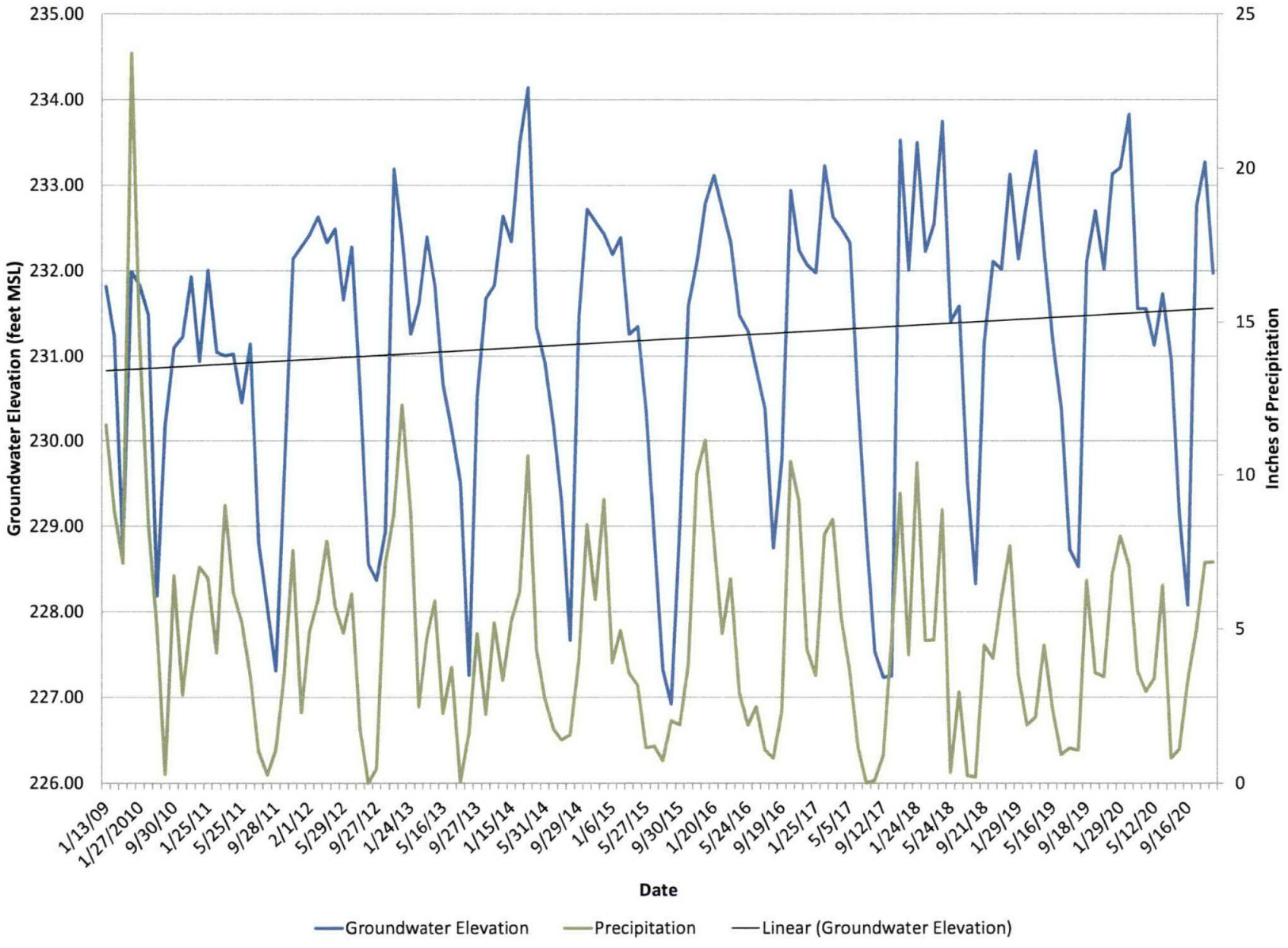
Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-09S



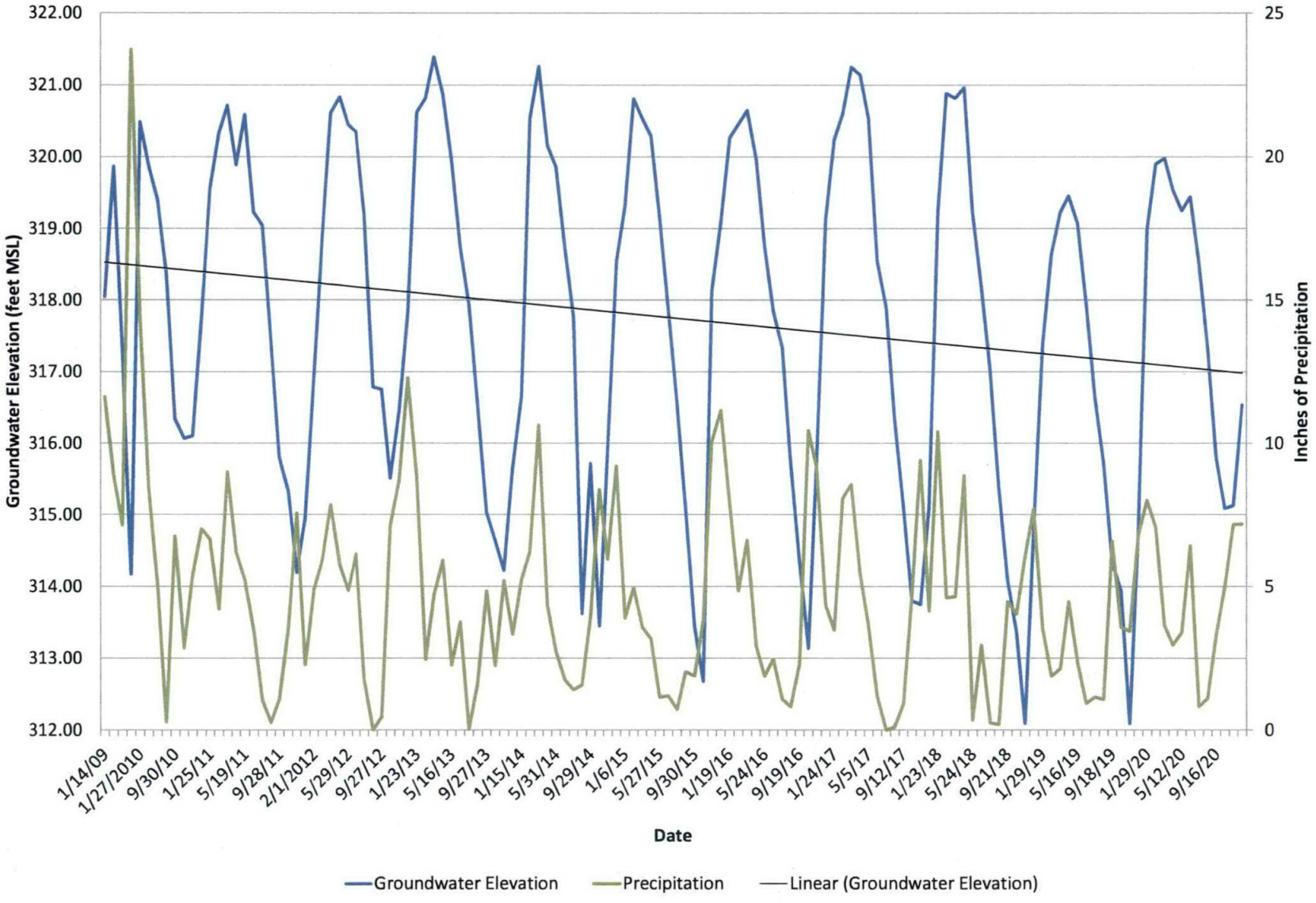
Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-10S



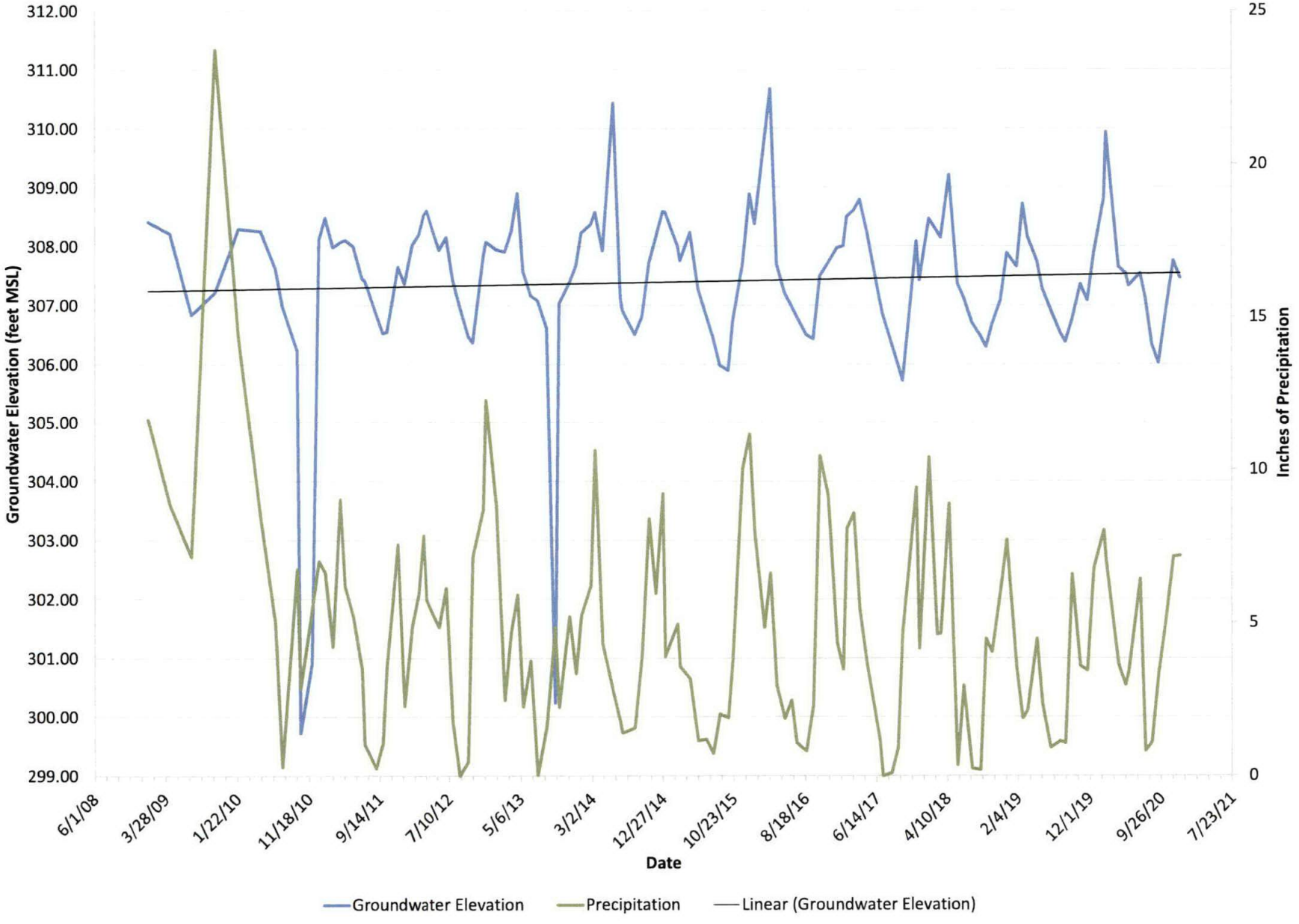
Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-11S



Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-14S



Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-24S



Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296
Tel: (360) 668-7652

GROUND WATER ELEVATIONS

Cathcart

Location	Aquifer	Date	MSL Water Elev (Ft)
G-09S	S	1/7/2020	242.70
G-10S	S	1/7/2020	244.81

Snohomish County Solid Waste
Environmental Services Section
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Snohomish, WA 98296
Tel: (360) 668-7652

GROUND WATER ELEVATIONS

Cathcart

Location	Aquifer	Date	MSL Water Elev (Ft)
G-01A	S	5/12/2020	218.67
G-04A	S	5/13/2020	273.01
G-08D1	S	5/13/2020	198.79
G-09S	S	5/12/2020	243.08
G-10S	S	5/12/2020	243.63
G-11S	S	5/12/2020	231.13
G-14S	S	5/13/2020	319.25
G-24S	S	5/13/2020	307.33

Site: **Cathcart Landfill - Shallow Aquifer**

Measurement Date: **5/12/2020**

	[X] matrix			[D] matrix
Well ID	**X-axis**	**Y-axis**	**GW Elev.**	**D**
G-01A	413.12	3968.37	**218.67**	1
G-04A	213.73	2603.52	**273.01**	1
G-08D1	710.11	4157.06	**198.79**	1
G-09S	723.45	3612.73	**243.08**	1
G-10S	470.79	3595.13	**243.63**	1
G-11S	267.66	3807.05	**231.13**	1
G-14S	1256.30	2341.04	**319.25**	1
G-24S	778.15	538.89	**307.33**	1
9	0	0	0	1
10	0	0	0	1
11	0	0	0	1
12	0	0	0	1
13	0	0	0	1
14	0	0	0	1
15	0	0	0	1
16	0	0	0	1
17	0	0	0	1
18	0	0	0	1
19	0	0	0	1
20	0	0	0	1

Pt

	413.12	213.73	710.11	723.45	470.79	267.66	1256.3	778.15
	3968.37	2603.52	4157.06	3612.7	3595.13	3807.1	2341	538.89
	218.67	273.01	198.79	243.08	243.63	231.13	319.25	307.33

{[P]t[P]}

3721076.974	13833394.8	1282491.8
13833394.8	86048702.88	5951913.9
1282491.809	5951913.901	530105.32

{[P]t[P]}'

1.6621E-06	4.89554E-08	-4.57E-06
4.89554E-08	5.34661E-08	-7.19E-07
-4.5708E-06	-7.18745E-07	2.101E-05

{[P]t[P]}'[P]t

-0.000118578	-0.000765177	0.0004752	0.0003	-0.000155084	-4E-04	0.0007	-9E-05
7.52298E-05	-4.65613E-05	0.0001141	5E-05	4.01575E-05	5E-05	-4E-05	-2E-04
-0.000145285	0.002888996	-0.002056	-8E-04	0.000383905	0.0009	-7E-04	0.0025

{[P]t[P]}'[P]t [D] = [A] matrix

A	-6.21726E-05
B	9.05877E-05
C	0.002971967

Groundwater Gradient:	**0.0370**	
Conductivity (ft/day):	**0.001**	
Effective porosity:	**10%**	
GW velocity:	**0.00037**	**ft/day**
	0.13	**ft/year**
Flow direction:	**124.46**	**degrees from the positive x-axis**

This spreadsheet is from the paper, "A Spreadsheet Method For Estimating Hydraulic Gradient With Heads From Multiple Wells" submitted to Ground Water, March, 2002. To use the program, enter the coordinates for the well locations in the columns labeled x and y (part of the [X] matrix), and the water levels in the z column. The matrices are automatically updated and the gradient magnitude and direction are calculated in cell H30 and H35.

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296
Tel: (360) 668-7652

GROUND WATER ELEVATIONS

Cathcart

Location	Aquifer	Date	MSL Water Elev (Ft)
G-09S	S	8/5/2020	242.69
G-10S	S	8/5/2020	243.03

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296
Tel: (360) 668-7652

GROUND WATER ELEVATIONS

Cathcart

Location	Aquifer	Date	MSL Water Elev (Ft)
G-01A	S	10/15/2020	220.70
G-04A	S	10/15/2020	271.81
G-08D1	S	10/14/2020	197.60
G-09S	S	10/15/2020	241.57
G-10S	S	10/15/2020	242.52
G-11S	S	10/14/2020	232.76
G-14S	S	10/14/2020	315.09
G-24S	S	10/14/2020	306.86

Site: **Cathcart Landfill - Shallow Aquifer**

Measurement Date: **10/14/2020**

		[X] matrix		[D] matrix
Well ID	**X-axis**	**Y-axis**	**GW Elev.**	D
G-01A	413.12	3968.37	**220.70**	1
G-04A	213.73	2603.52	**271.81**	1
G-08D1	710.11	4157.06	**197.60**	1
G-09S	723.45	3612.73	**241.57**	1
G-10S	470.79	3595.13	**242.52**	1
G-11S	267.66	3807.05	**232.76**	1
G-14S	1256.30	2341.04	**315.09**	1
G-24S	778.15	538.89	**306.86**	1
9	0	0	0	1
10	0	0	0	1
11	0	0	0	1
12	0	0	0	1
13	0	0	0	1
14	0	0	0	1
15	0	0	0	1
16	0	0	0	1
17	0	0	0	1
18	0	0	0	1
19	0	0	0	1
20	0	0	0	1

Pt

413.12	213.73	710.11	723.45	470.79	267.66	1256.3	778.15
3968.37	2603.52	4157.06	3612.7	3595.13	3807.1	2341	538.89
220.7	271.81	197.6	241.57	242.52	232.76	315.09	306.86

{[P]t[P]}

3721076.974	13833394.8	1275458.3
13833394.8	86048702.88	5938666.2
1275458.296	5938666.237	526428.93

{[P]t[P]}'

1.62691E-06	4.73961E-08	-4.48E-06
4.73961E-08	5.38622E-08	-7.22E-07
-4.47644E-06	-7.22455E-07	2.09E-05

{[P]t[P]}'[P]t

-0.000127755	-0.000745625	0.0004678	0.0003	-0.000149297	-4E-04	0.0007	-8E-05
7.38795E-05	-4.60093E-05	0.0001148	5E-05	4.07453E-05	5E-05	-4E-05	-2E-04
-0.000104666	0.002841898	-0.002053	-8E-04	0.000362764	0.0009	-7E-04	0.0025

{[P]t[P]}'[P]t [D] = [A] matrix

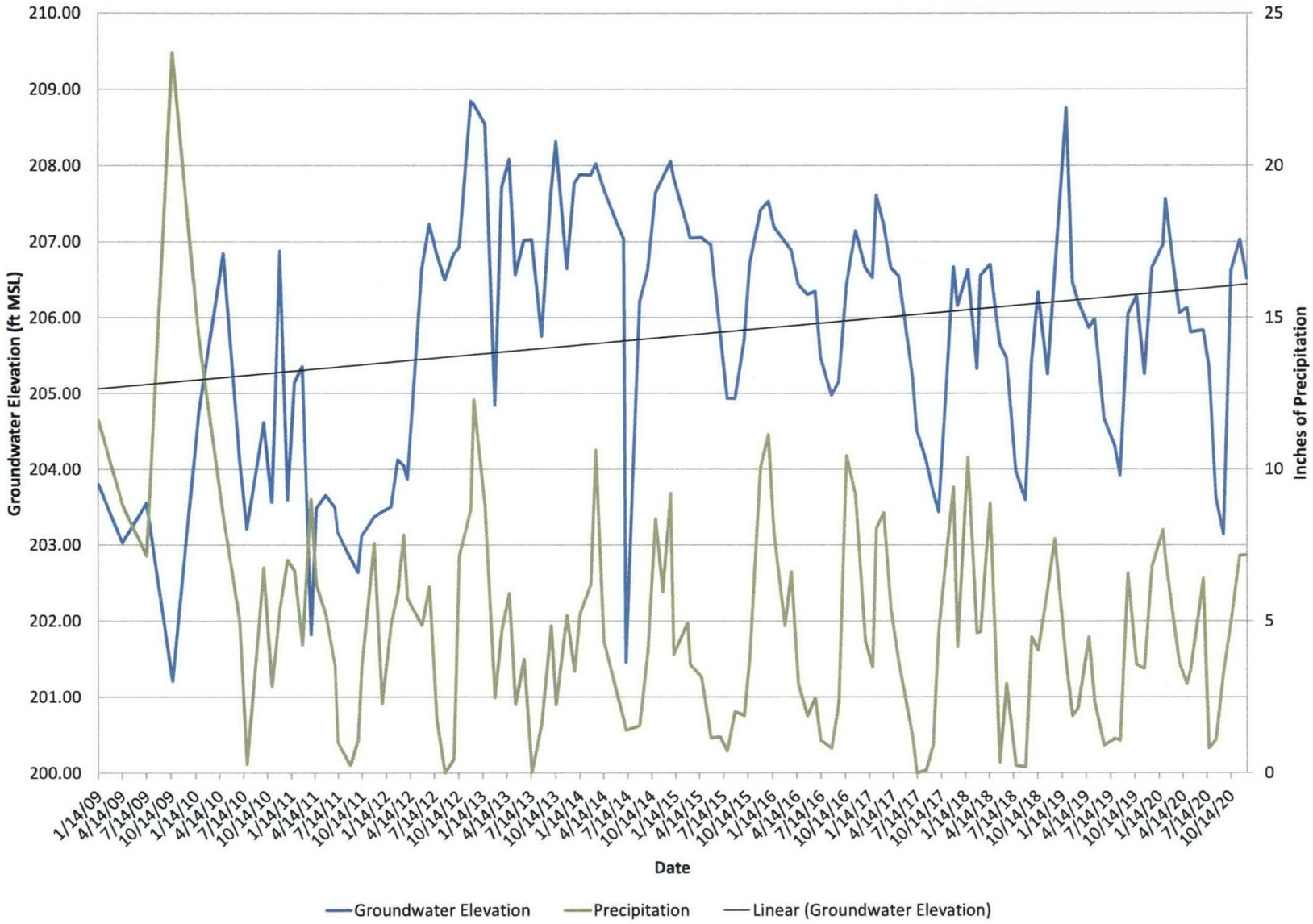
A	-5.18542E-05
B	8.95747E-05
C	0.00296924

Groundwater Gradient:	**0.0349**	
Conductivity (ft/day):	**0.001**	
Effective porosity:	**10%**	
GW velocity:	**0.000349**	**ft/day**
	0.13	**ft/year**
Flow direction:	**120.07**	**degrees from the positive x-axis**

This spreadsheet is from the paper, "A Spreadsheet Method For Estimating Hydraulic Gradient With Heads From Multiple Wells" submitted to Ground Water, March, 2002. To use the program, enter the coordinates for the well locations in the columns labeled x and y (part of the [X] matrix), and the water levels in the z column. The matrices are automatically updated and the gradient magnitude and direction are calculated in cell H30 and H35.

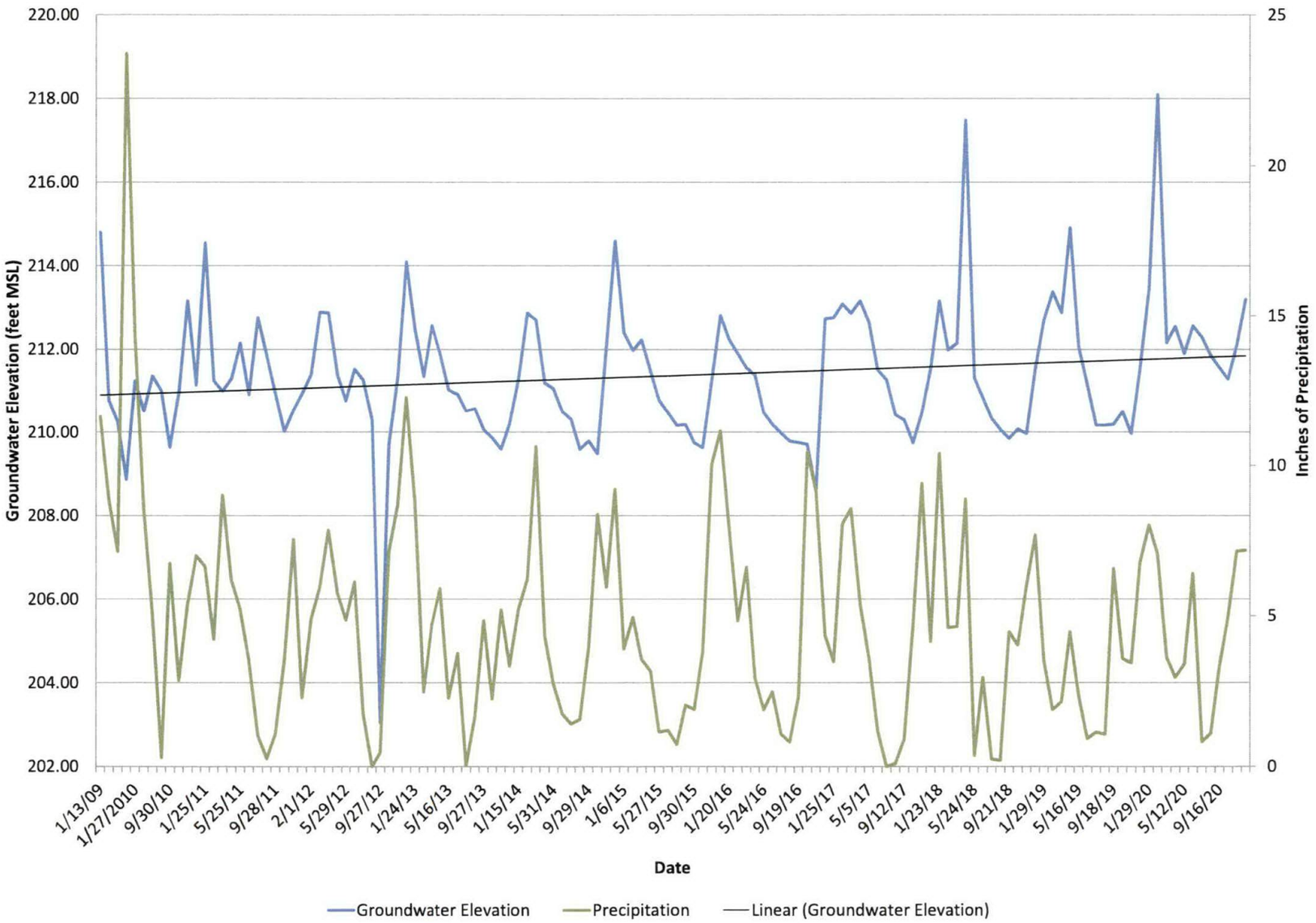
Deep Wells

Hydrograph
Cathcart Landfill Deep Aquifer
Well G-01D



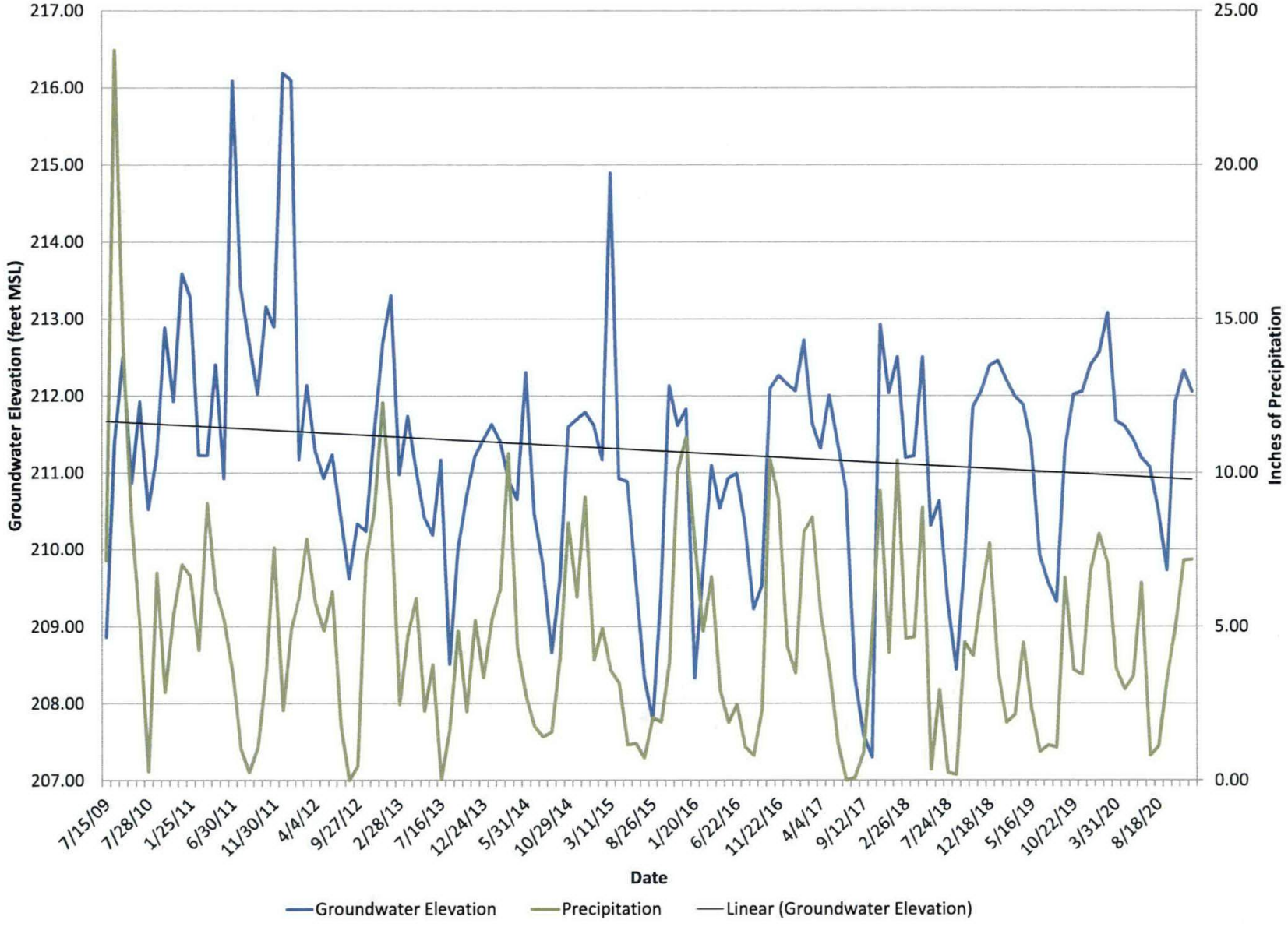
[redacted]

Hydrograph
Cathcart Landfill Deep Aquifer
Well G-02D

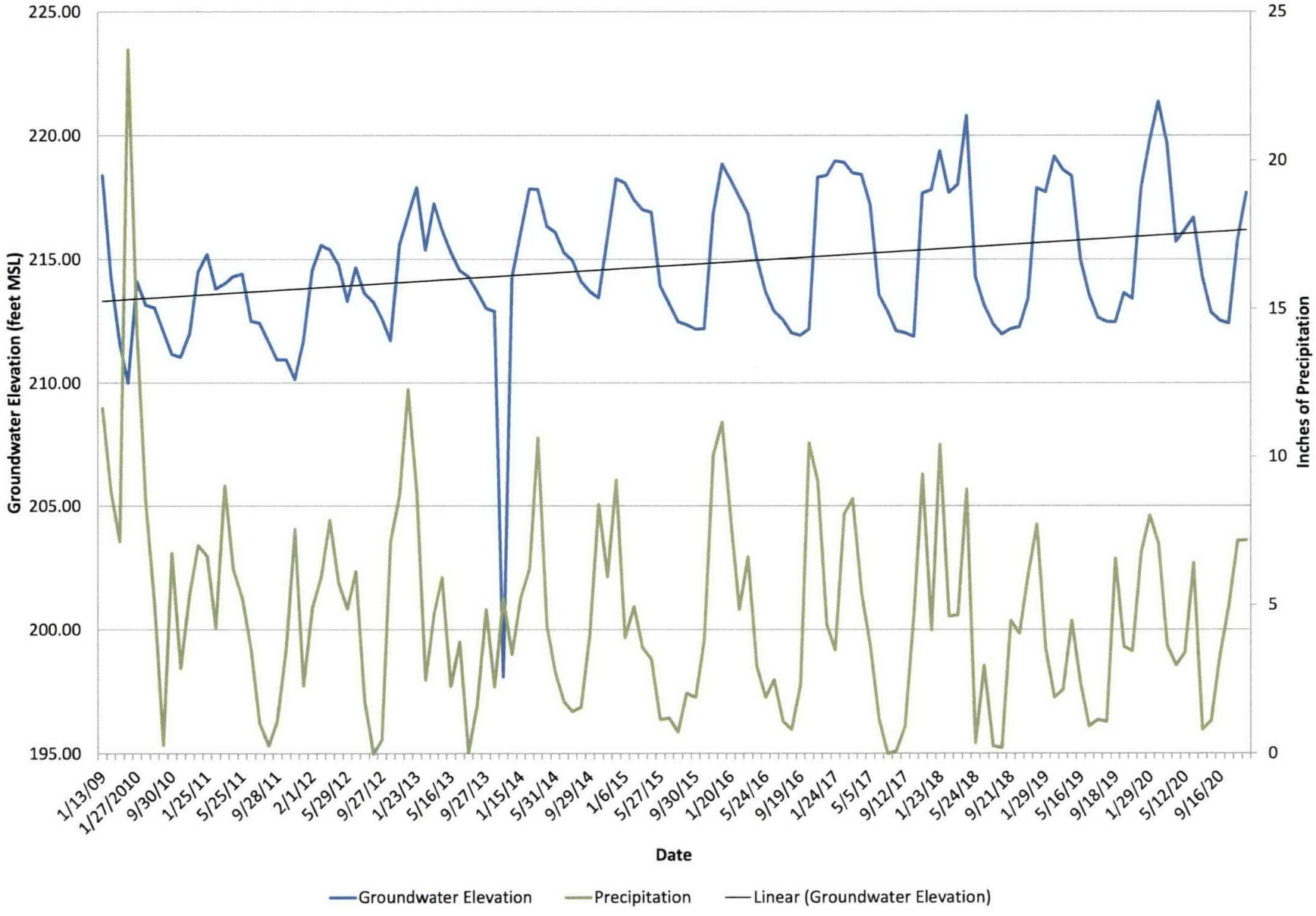


[redacted]

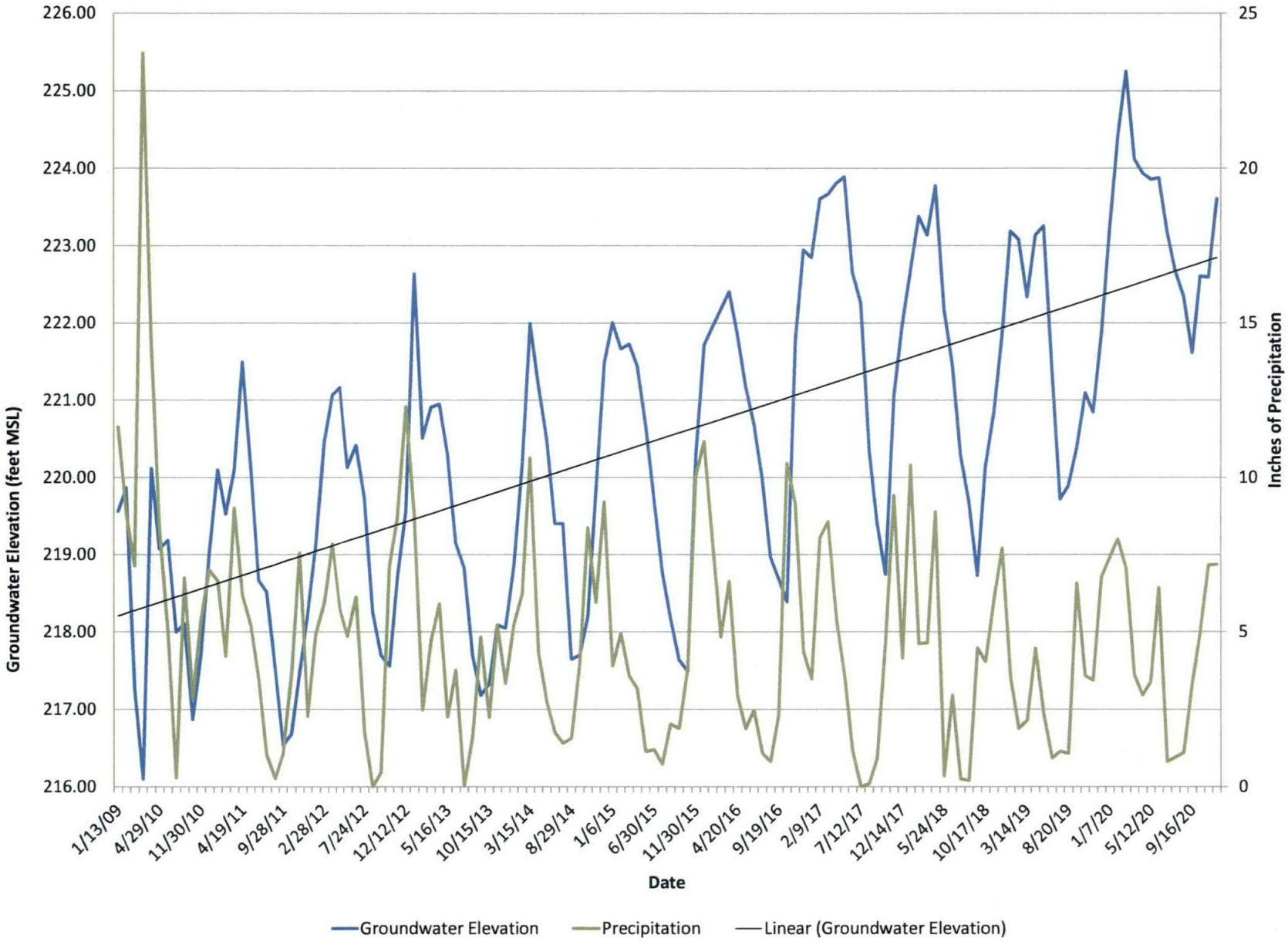
Hydrograph
Cathcart Landfill Deep Aquifer
Well G-06B



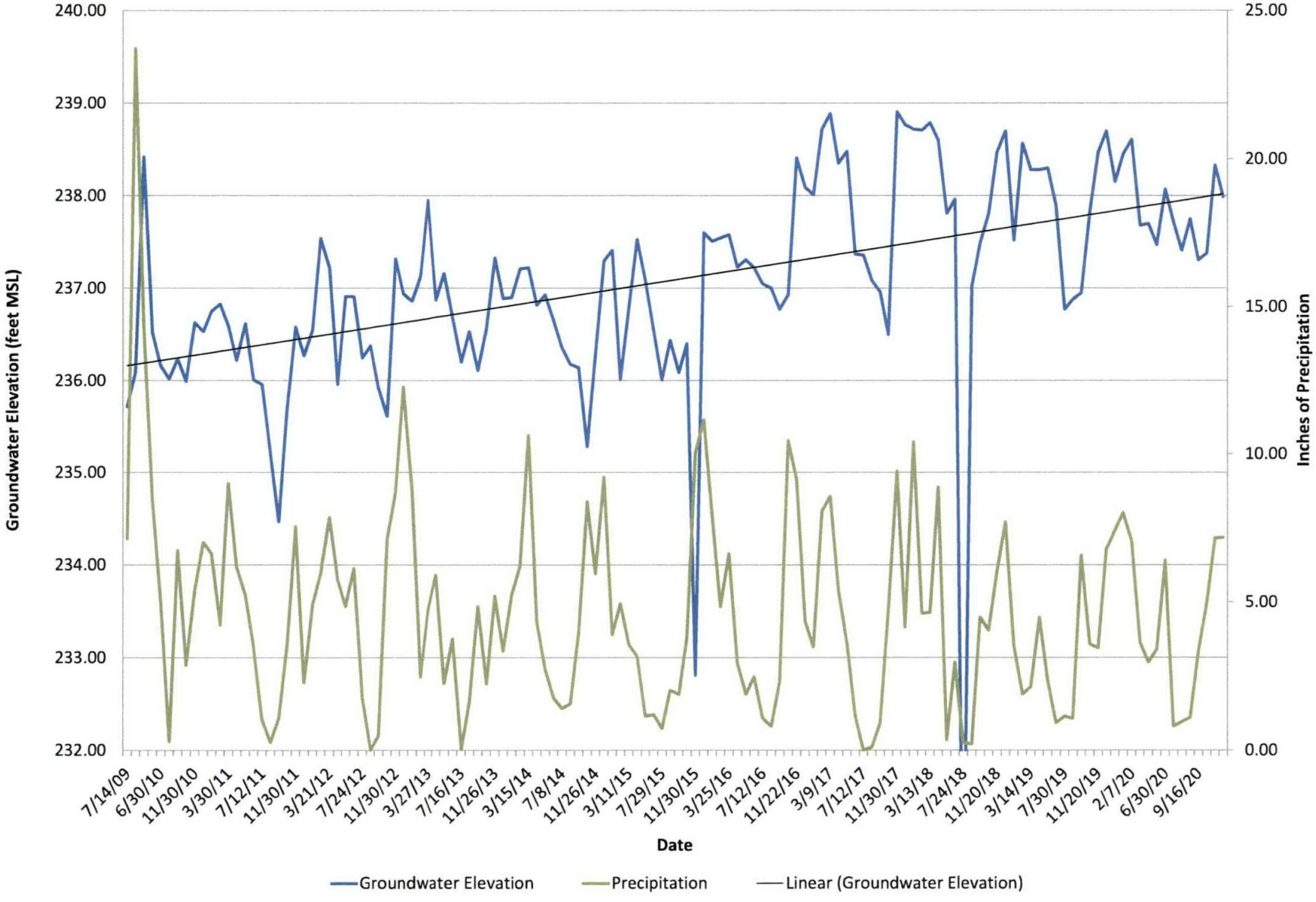
Hydrograph
Cathcart Landfill Deep Aquifer
Well G-08D2



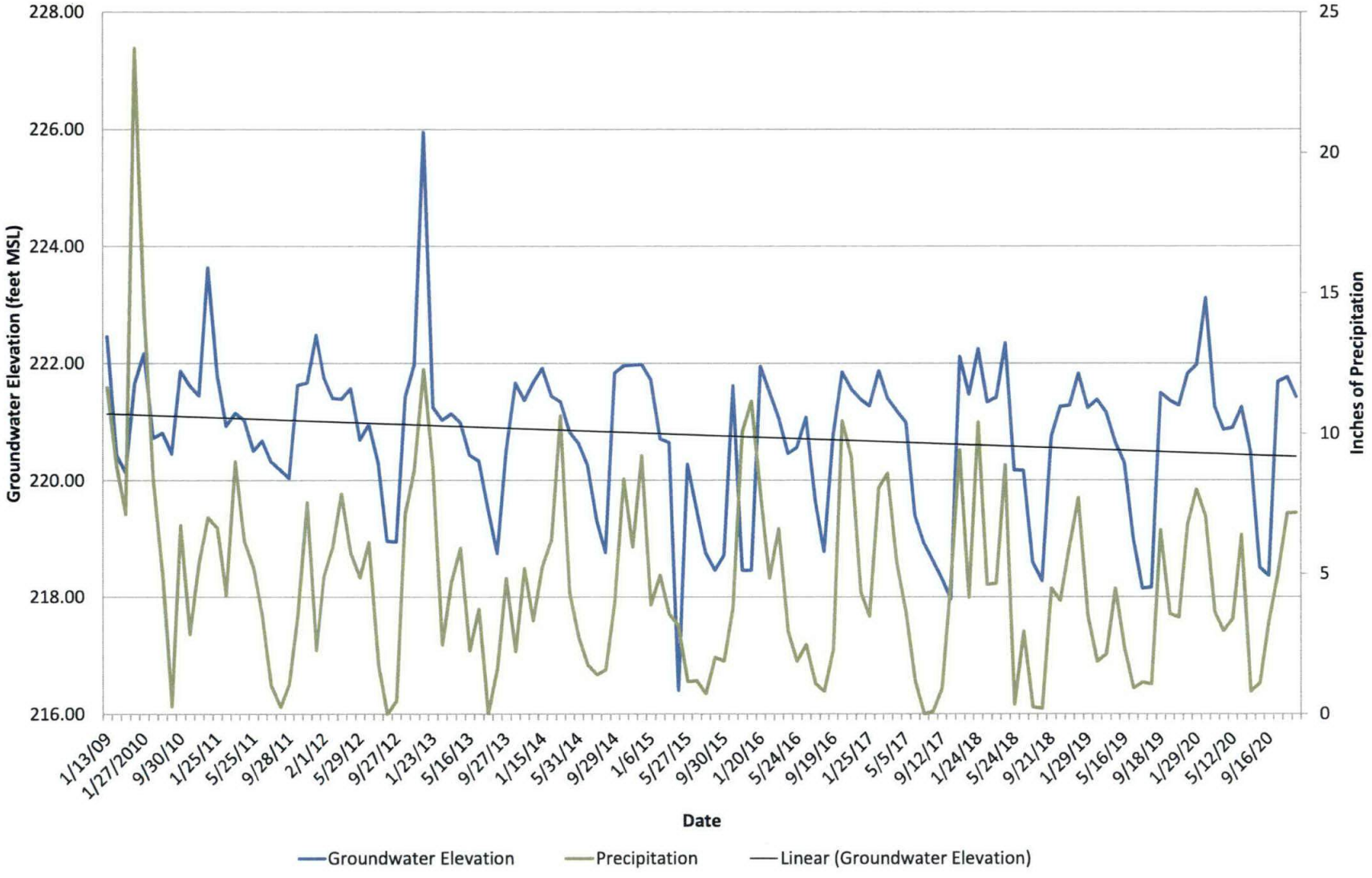
Hydrograph
Cathcart Landfill Deep Aquifer
Well G-09D



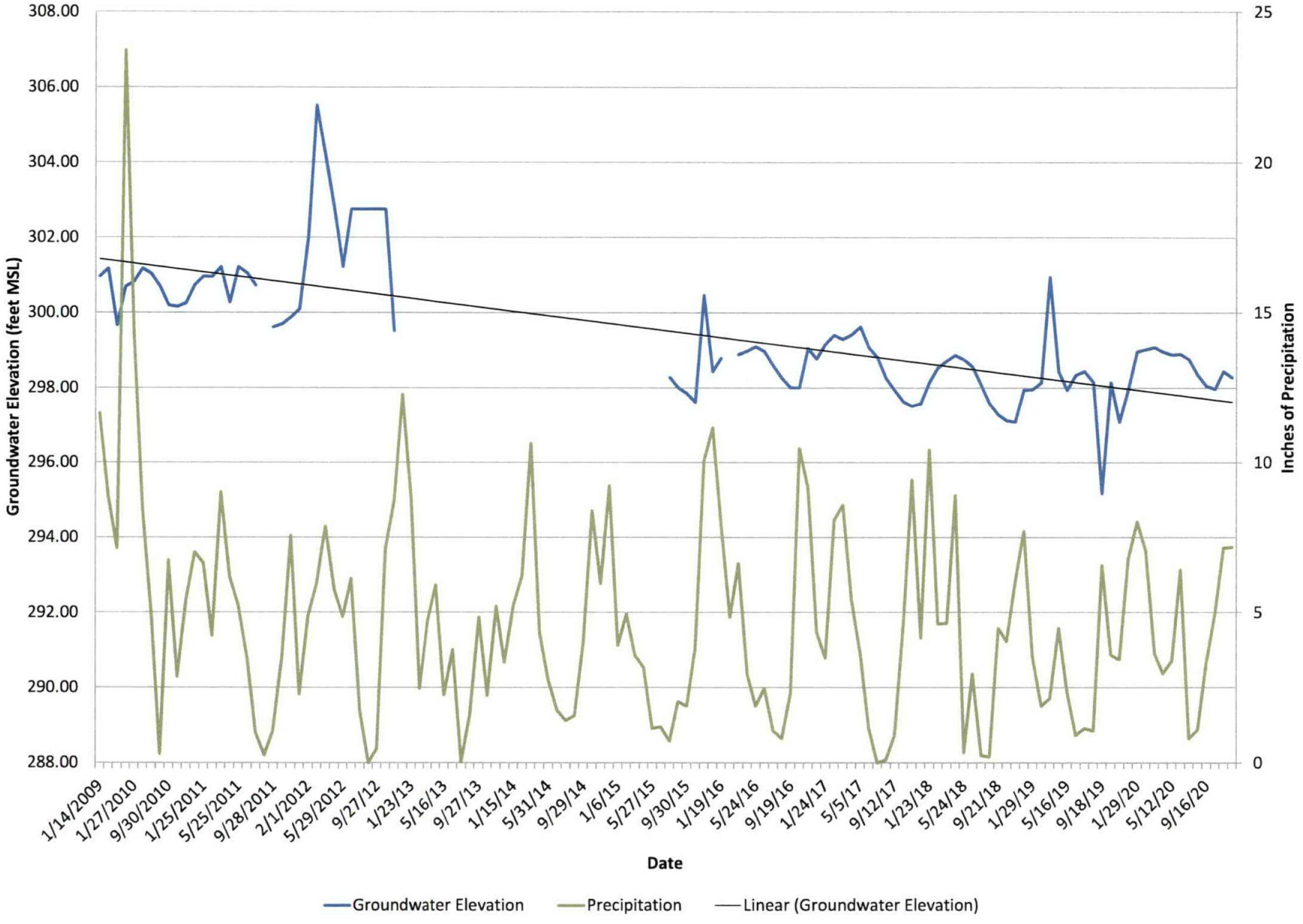
Hydrograph
Cathcart Landfill Deep Aquifer
Well G-10D



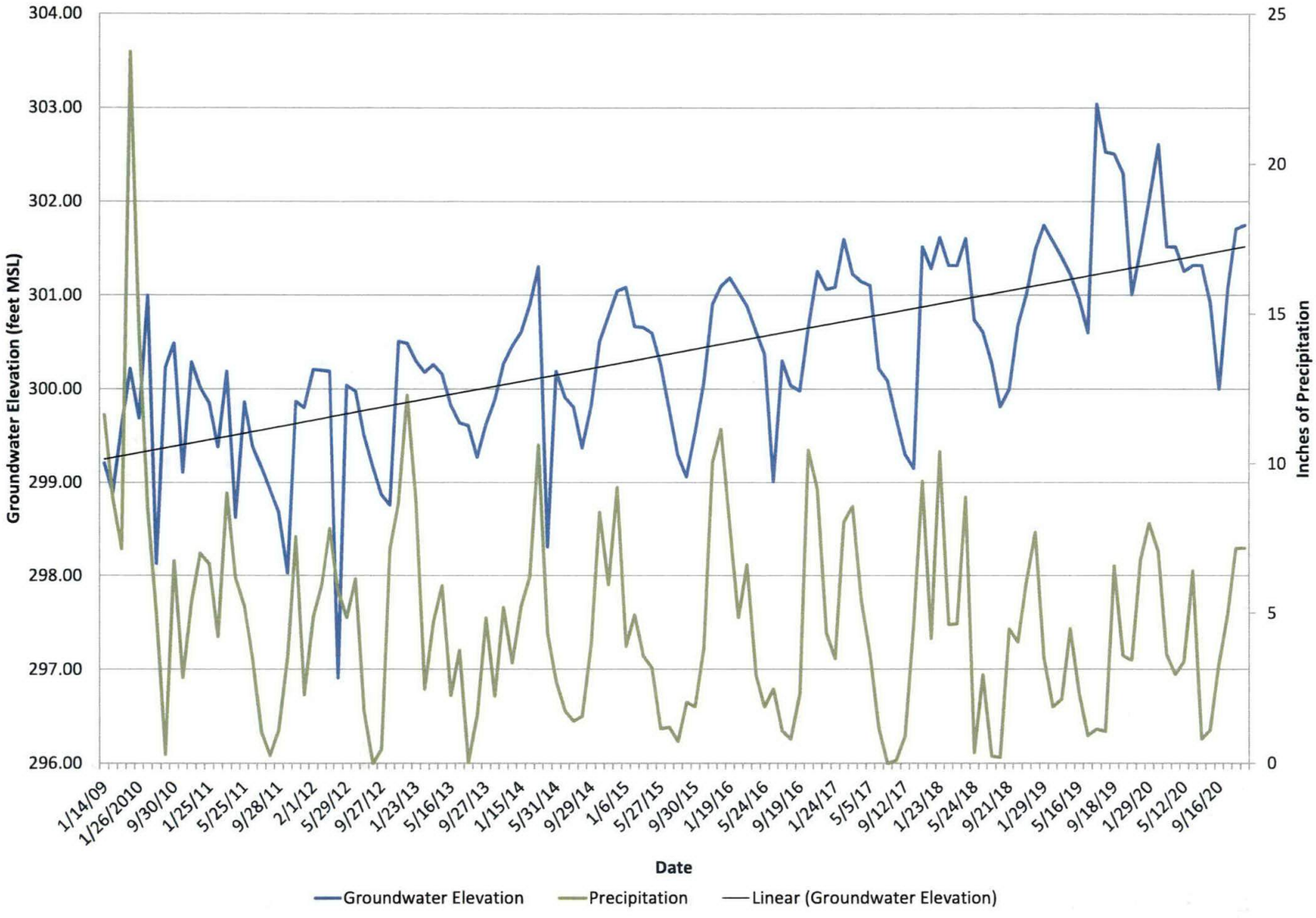
Hydrograph
Cathcart Landfill Deep Aquifer
Well G-13D



Hydrograph
Cathcart Landfill Deep Aquifer
Well G-14D



Hydrograph
Cathcart Landfill Deep Aquifer
Well G-24D



Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296
Tel: (360) 668-7652

GROUND WATER ELEVATIONS

Cathcart

Location	Aquifer	Date	MSL Water Elev (Ft)
G-09D	D	1/7/2020	223.25
G-10D	D	1/7/2020	238.15

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GROUND WATER ELEVATIONS

Cathcart

Location	Aquifer	Date	MSL Water Elev (Ft)
G-01D	D	5/12/2020	205.81
G-02D	D	5/13/2020	211.90
G-06B	D	5/12/2020	211.44
G-08D2	D	5/13/2020	216.19
G-09D	D	5/12/2020	223.86
G-10D	D	5/12/2020	237.47
G-13D	D	5/12/2020	220.90
G-14D	D	5/13/2020	298.88
G-24D	D	5/13/2020	301.26

Site: **Cathcart Landfill - Deep Aquifer**

Measurement Date: **5/12/2020**

		[X] matrix		[D] matrix
Well ID	**X-axis**	**Y-axis**	**GW Elev.**	D
G-01D	431.12	3977.30	**205.81**	1
G-02D	733.79	3884.79	**211.90**	1
G-06B	488.43	3765.90	**211.44**	1
G-08D2	728.12	4156.36	**216.19**	1
G-09D	739.20	3614.85	**223.86**	1
G-10D	495.97	3593.41	**237.47**	1
G-13D	220.31	3939.18	**220.90**	1
G-14D	1266.00	2337.53	**298.88**	1
G-24D	780.99	528.85	**301.26**	1
10	0	0	0	1
11	0	0	0	1
12	0	0	0	1
13	0	0	0	1
14	0	0	0	1
15	0	0	0	1
16	0	0	0	1
17	0	0	0	1
18	0	0	0	1
19	0	0	0	1
20	0	0	0	1

Pt

431.12	733.79	488.43	728.1	739.2	496	220.3	1266	781
3977.3	3884.79	3765.9	4156	3614.85	3593	3939	2338	528.9
205.81	211.9	211.44	216.2	223.86	237.5	220.9	298.9	301.3

{[P]t[P]}

4546675.575	18125521.98	1450490
18125521.98	109608443.7	6727255
1450489.725	6727255.052	514093.3

{[P]t[P]}'

2.37925E-06	9.42872E-08	-7.95E-06
9.42872E-08	5.00804E-08	-9.21E-07
-7.94674E-06	-9.21363E-07	3.64E-05

{[P]t[P]}'[P]t

-0.00023477	0.000428239	-0.000163	4E-04	0.000320616	-4E-04	-9E-04	9E-04	-5E-04
5.02083E-05	6.85022E-05	3.98E-05	8E-05	4.44741E-05	8E-06	1E-05	-4E-05	-2E-04
0.000405718	-0.00169247	0.00035	-0.002	-0.001051128	0.001	0.003	-0.001	0.004

{[P]t[P]}'[P]t [D] = [A] matrix

A	-9.94556E-05
B	8.66916E-05
C	0.003284954

Groundwater Gradient:	**0.0402**	
Conductivity (ft/day):	**0.029**	
Effective porosity:	**10%**	
GW velocity:	**0.012**	**ft/day**
	4.25	**ft/year**
Flow direction:	**138.92**	**degrees from the positive x-axis**

This spreadsheet is from the paper, "A Spreadsheet Method For Estimating Hydraulic Gradient With Heads From Multiple Wells" submitted to Ground Water, March, 2002. To use the program, enter the coordinates for the well locations in the columns labeled x and y (part of the [X] matrix), and the water levels in the z column. The matrices are automatically updated and the gradient magnitude and direction are calculated in cell H30 and H35.

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GROUND WATER ELEVATIONS

Cathcart

Location	Aquifer	Date	MSL Water Elev (Ft)
G-09D	D	8/5/2020	222.67
G-10D	D	8/5/2020	237.41

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GROUND WATER ELEVATIONS

Cathcart

Location	Aquifer	Date	MSL Water Elev (Ft)
G-01D	D	10/15/2020	206.62
G-02D	D	10/14/2020	211.29
G-06B	D	10/14/2020	211.92
G-08D2	D	10/14/2020	212.42
G-09D	D	10/15/2020	222.61
G-10D	D	10/15/2020	237.38
G-13D	D	10/15/2020	221.69
G-14D	D	10/14/2020	297.97
G-24D	D	10/14/2020	301.07

Site: **Cathcart Landfill - Shallow Aquifer**

Measurement Date: **10/14/2020**

	[X] matrix			[D] matrix
Well ID	**X-axis**	**Y-axis**	**GW Elev.**	D
G-01A	413.12	3968.37	**220.70**	1
G-04A	213.73	2603.52	**271.81**	1
G-08D1	710.11	4157.06	**197.60**	1
G-09S	723.45	3612.73	**241.57**	1
G-10S	470.79	3595.13	**242.52**	1
G-11S	267.66	3807.05	**232.76**	1
G-14S	1256.30	2341.04	**315.09**	1
G-24S	778.15	538.89	**306.86**	1
9	0	0	0	1
10	0	0	0	1
11	0	0	0	1
12	0	0	0	1
13	0	0	0	1
14	0	0	0	1
15	0	0	0	1
16	0	0	0	1
17	0	0	0	1
18	0	0	0	1
19	0	0	0	1
20	0	0	0	1

Pt

413.12	213.73	710.11	723.45	470.79	267.66	1256.3	778.15
3968.37	2603.52	4157.06	3612.7	3595.13	3807.1	2341	538.89
220.7	271.81	197.6	241.57	242.52	232.76	315.09	306.86

{[P]t[P]}

3721076.974	13833394.8	1275458.3
13833394.8	86048702.88	5938666.2
1275458.296	5938666.237	526428.93

{[P]t[P]}'

1.62691E-06	4.73961E-08	-4.48E-06
4.73961E-08	5.38622E-08	-7.22E-07
-4.47644E-06	-7.22455E-07	2.09E-05

{[P]t[P]}'[P]t

-0.000127755	-0.000745625	0.0004678	0.0003	-0.000149297	-4E-04	0.0007	-8E-05
7.38795E-05	-4.60093E-05	0.0001148	5E-05	4.07453E-05	5E-05	-4E-05	-2E-04
-0.000104666	0.002841898	-0.002053	-8E-04	0.000362764	0.0009	-7E-04	0.0025

{[P]t[P]}'[P]t [D] = [A] matrix

A	-5.18542E-05
B	8.95747E-05
C	0.00296924

Groundwater Gradient:	**0.0349**	
Conductivity (ft/day):	**0.001**	
Effective porosity:	**10%**	
GW velocity:	**0.000349**	**ft/day**
	0.13	**ft/year**
Flow direction:	**120.07**	**degrees from the positive x-axis**

This spreadsheet is from the paper, "A Spreadsheet Method For Estimating Hydraulic Gradient With Heads From Multiple Wells" submitted to Ground Water, March, 2002. To use the program, enter the coordinates for the well locations in the columns labeled x and y (part of the [X] matrix), and the water levels in the z column. The matrices are automatically updated and the gradient magnitude and direction are calculated in cell H30 and H35.

Appendix B

Groundwater Analytical Summary Tables

Shallow Wells

Groundwater Analytical Summary - Shallow Wells: First Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09S					G-10S				
						1/7/20	D	V	Tr	Ch	1/7/20	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)															
Alkalinity (as CaCO3)	nonpar	77	77	200	--	340			I	N	450				
Ammonia Nitrogen	lognor	73	42	14.5571	--	0.02	U				0.268			I	Y
Bicarbonate	nonpar	77	77	200	--	340			I	N	450				
Calcium, Dissolved	normal	75	75	23.9949	--	81.1			D	N	104			D	N
Chemical Oxygen Demand	nonpar	77	10	28	--	15					10	U			
Chloride	nonpar	77	76	18.3	250	3.83			D	N	9.83			D	N
Conductivity (umhos/cm)	nonpar	76	76	540	700	950			D	Y	530				
Magnesium, Dissolved	lognor	73	64	57.0254	--	31.1			D	N	24.6			D	N
Nitrate Nitrogen (mg-N/L)	lognor	74	69	2.4692	10	0.074					0.53				
Nitrite Nitrogen (mg-N/L)	lognor	69	43	24.3009	1	0.008					0.010				
pH (std units)	normal	77	77	5.75-10.14	6.5-8.5	6.18					6.46				
Potassium, Dissolved	lognor	75	74	2.7196	--	4.81			D	Y	3.7				
Sodium, Dissolved	normal	75	75	125.8433	20	88.5			D	N	185				
Sulfate	normal	76	76	135.0174	250	180			D	Y	332				
Total Dissolved Solids	normal	77	77	405.899	500	590			D	N	930				
Total Organic Carbon	nonpar	77	68	22.0	--	5.2					4.6				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony	nonpar	77	34	0.0019	0.006	0.0003	U				0.0003	U			
Arsenic	nonpar	72	68	0.004	0.00005	0.000945					0.0071			I	N
Barium	lognor	70	55	4.312	1	0.0122					0.0162				
Beryllium	nonpar	77	0	0.0005	0.004	0.0005	U				0.0005	U			
Cadmium	nonpar	72	35	0.001	0.005	0.00005	U				0.00005	U			
Chromium	nonpar	75	28	0.015	0.05	0.005					0.0066				
Cobalt	nonpar	76	5	0.003	--	0.005	U				0.005	U			
Copper	nonpar	73	39	0.115	1	0.005	U				0.005	U			
Iron	lognor	74	46	13.6764	0.3	0.01	U				11.2			I	Y
Lead	nonpar	77	33	0.0027	0.05	0.0001	U				0.0001	U			
Manganese	lognor	70	55	4.3738	0.05	0.022					3.24			D	N
Nickel	nonpar	75	19	0.038	0.1	0.014					0.006				
Selenium	nonpar	76	6	0.002	0.01	0.0003	U				0.0003	U			
Silver	nonpar	71	4	0.0002	0.05	0.0001	U				0.0001	U			
Thallium	nonpar	76	6	0.003	0.002	0.00005	U				0.00005	U			
Vanadium	nonpar	77	2	0.01	--	0.011					0.01	U			
Zinc	nonpar	76	33	0.03	5	0.005					0.005	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony					0.006	0.0003	U				0.0003	U			
Arsenic					0.00005	0.000873					0.00646				
Barium					1	0.005	U				0.0068				
Beryllium					0.004	0.0005	U				0.0005	U			
Cadmium					0.005	0.00005	U				0.00005	U			
Chromium					0.05	0.0164					0.0108				
Cobalt					--	0.005	U				0.005	U			
Copper					1	0.005	U				0.005	U			
Iron					0.3	0.834					11.0				
Lead					0.05	0.00138					0.0001	U			
Manganese					0.05	0.174					3.21				
Nickel					0.1	0.02					0.006				
Selenium					0.01	0.00058					0.0003	U			
Silver					0.05	0.00238					0.0001	U			
Thallium					0.002	0.00005	U				0.00005	U			
Vanadium					--	0.01	U				0.01	U			
Zinc					5	0.0059					0.005	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)															
1,1,1-Trichloroethane					200	1	U				1	U			
1,1,2,2-Tetrachloroethane					--	1	U				1	U			
1,1,2-Trichloroethane					--	1	U				1	U			
1,1-Dichloroethane					1	1	U				1	U			
1,1-Dichloroethylene					--	1	U				1	U			
1,2,3-Trichloropropane					--	1	U				1	U			
1,2-Dibromo-3-chloropropane					0.2	5	U				5	U			
1,2-Dibromoethane					0.001	0.01	U				0.01	U			
1,2-Dichlorobenzene					--	1	U				1	U			

Groundwater Analytical Summary - Shallow Wells: First Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09S					G-10S				
						1/7/20	D	V	Tr	Ch	1/7/20	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)															
1,2-Dichloroethane					0.5	0.5	U				0.5	U			
1,2-Dichloropropane					0.6	0.6	U				0.6	U			
1,4-Dichlorobenzene					4	1	U				1	U			
2-Butanone					--	5	U				5	U			
2-Hexanone					--	5	U				5	U			
4-Methyl-2-Pentanone (MIBK)					--	5	U				5	U			
Acetone					--	5	U				5	U			
Acrylonitrile					0.07	0.01	U				0.01	U			
Benzene					1	1	U				1	U			
Bromodichloromethane					0.3	0.3	U				0.3	U			
Bromoform					5	1	U				1	U			
Bromomethane					--	1	U				1	U			
Carbon Disulfide					--	1	U				1	U			
Carbon Tetrachloride					0.3	0.3	U				0.3	U			
Chlorobenzene					--	0.2	U				0.2	U			
Chlorodibromomethane					0.5	0.5	U				0.5	U			
Chloroethane					--	1	U				1	U			
Chloroform					7	1	U				1	U			
Chloromethane					--	**6.8**					1	U			
cis-1,2-Dichloroethene					--	0.2	U				0.2	U			
cis-1,3-Dichloropropene					0.2	0.2	U				0.2	U			
Dibromomethane					--	0.01	U				0.01	U			
Ethyl Benzene					--	1	U				1	U			
m,p-Xylene					--	1	U				1	U			
Methyl Iodide					--	1	U				1	U			
Methylene Chloride					5	2	U				2	U			
o-Xylene					--	1	U				1	U			
Styrene					--	1	U				1	U			
Tetrachloroethylene					0.8	0.8	U				0.8	U			
Toluene					--	1	U				1	U			
trans-1,2-Dichloroethene					--	1	U				1	U			
trans-1,3-Dichloropropene					0.2	0.2	U				0.2	U			
trans-1,4-Dichloro-2-butene					--	5	U				5	U			
Trichlorethene (1,1,2-Trichloroethylene)					3	1	U				1	U			
Trichlorofluoromethane					--	1	U				1	U			
Vinyl Acetate					--	5	U				5	U			
Vinyl Chloride					0.02	0.01	U				0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in purple exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards - the most restrictive of the two is used.

X = Methylene chloride was measured in the trip blank, but not in the lab blank - contaminations during transport is suspected.

Groundwater Analytical Summary - Shallow Wells: Second Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																										Upgradient Wells									
						G-01A					G-04A					G-08D1					G-09S					G-10S					G-11S					G-14S					G-24S				
						5/12/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)																																										
Alkalinity (as CaCO3)	nonpar	75	75	200	--	40					150		P			160					360		V	I	N	450		V			74			D	N	190					140				
Ammonia Nitrogen	lognor	74	40	16.6482	--	0.02	U				0.396					0.109					0.027					0.27			I	N	0.033					0.021					0.02	U			
Bicarbonate	nonpar	75	75	200	--	40					150		P			120					360		V	I	N	450		V			74			D	N	160					140				
Calcium, Dissolved	normal	73	73	23.8526	--	13.2					44.4		E			0.9			I	N	80.1		V	D	N	101		V	D	N	8.07					0.6				Y	10.0			D	Y
Chemical Oxygen Demand	nonpar	75	10	16	--	12		P			57		E			15					10	U				15					10	U				10	U				15				
Chloride	nonpar	75	74	18.3	250	0.08					2.86			I	N	3.01			D	N	3.17			D	N	7.25			D	N	3.56					2.19				Y	6.26				
Conductivity (umhos/cm)	nonpar	74	74	540	700	130					370					430					990		V	D	N	1400		E			220			D	N	400				Y	430				
Magnesium, Dissolved	lognor	72	62	53.3909	--	3.42					26.7					0.2	U				30.1			D	N	23.8			D	N	1.69					0.2	U				3.0			D	Y
Nitrate Nitrogen (mg-N/L)	lognor	73	68	2.2263	10	0.058					0.01	U				0.06					0.01	U				0.01	U				0.01	U				0.01	U		D	N	0.034				
Nitrite Nitrogen (mg-N/L)	lognor	70	40	36.85	1	0.002	U				0.002	U				0.007			D	N	0.002	U				0.002	U				0.002	U				0.002	U				0.002	U			
pH (std units)	nonpar	75	75	6.00-9.39	6.5-8.5	6.04					6.28					9.76		V			6.34					6.68					6.74					9.34			I	N	7.60				
Potassium, Dissolved	lognor	74	70	2.7509	--	0.67					1.86			I	Y	0.5	U		I	N	4.55		V	D	N	3.37		V			0.73					0.5	U				0.5	U			
Sodium, Dissolved	nonpar	75	75	123	20	5.43			D	N	12.8					104					93			D	N	191		V			43.3			D	N	99.1				Y	81.8				
Sulfate	nonpar	74	74	169	250	30.7					31.2					44.1					194		V	D	N	304		V			30.5			D	N	12.4			D	N	82.8				
Total Dissolved Solids	normal	75	75	404.5425	500	110					220					310					630		V	D	N	960		V			160			D	N	260			D	N	270				
Total Organic Carbon	nonpar	75	67	16	--	2.7					15.0		P			1.6				Y	4.8					4.0			D	Y	2.6					1.2					0.79				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)																																										
Antimony	nonpar	75	35	0.0019	0.006	0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.00032					0.0003	U			
Arsenic	normal	72	69	0.0038	0.00005	0.000152					0.0181		E	I	N	0.00132					0.000575					0.00638		V	I	N	0.0006					0.00344			I	Y	0.000472			D	N
Barium	lognor	69	56	2.8609	1	0.005	U				0.0076					0.0067					0.005	U		D	Y	0.0059					0.005	U				0.005	U				0.0054			D	N
Beryllium	nonpar	73	0	0.0005	0.004	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium	nonpar	71	32	0.001	0.005	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Chromium	nonpar	73	27	0.015	0.05	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt	nonpar	74	4	0.003	--	0.01	U				0.011		E			0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Copper	nonpar	71	38	0.115	1	0.01	U				0.01	U				0.01	U				0.01	U		D	Y	0.01	U				0.01	U			I	Y	0.01	U				0.01	U			
Iron	lognor	72	49	10.4257	0.3	0.05	U				25.9		E	I	N	0.551			I	N	0.05	U				10.5		E	I	N	0.05	U				0.097			I	N	0.05	U			
Lead	nonpar	75	34	0.0027	0.05	0.0001	U				0.0001	U				0.00021					0.0001	U				0.0001	U				0.00011					0.0001	U				0.0001	U			
Manganese	lognor	71	53	6.9361	0.05	0.005	U				6.0					0.012					0.048					3.14			D	N	0.021				I	Y	0.006					0.005	U			
Nickel	nonpar	73	21	0.038	0.1	0.01	U				0.012					0.01	U				0.018					0.01	U				0.01	U				0.01	U				0.01	U			
Selenium	nonpar	75	4	0.002	0.01	0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver	nonpar	70	4	0.0002	0.05	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium	nonpar	75	4	0.0001	0.002	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Vanadium	nonpar	75	0	0.005	--	0.01	U				0.01	U				0.01	U				0.01	U	P			0.01	U				0.01	U				0.01	U				0.01	U			
Zinc	nonpar	74	33	0.03	5	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)																																										
Antimony					0.006	0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.00045					0.00047					0.0003	U				0.0003	U			
Arsenic					0.00005	0.000285					0.0195					0.00119					0.811					0.00598					0.000493					0.00295					0.00104				
Barium					1	0.0074					0.005	U				0.0179					0.0118					0.0109					0.0055					0.0177					0.0151				
Beryllium					0.004	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium					0.005	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Chromium					0.05	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt					--	0.01	U				0.016					0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Copper					1	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.017				
Iron					0.3	0.173					28.1					3.22					0.577					11.4					0.05	U				2.73					0.963				
Lead					0.05	0.0001	U				0.000141					0.00125					0.00071					0.0001	U				0.0001	U				0.000785					0.00137				
Manganese					0.05	0.005	U				6.29					0.0691					0.144					3.28					0.0342					0.135					0.157				
Nickel					0.1	0.01	U				0.014					0.011					0.03					0.01	U				0.01	U				0.01	U				0.022				
Selenium					0.01	0.0005	U				0.00055					0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver					0.05	0.0001	U				0.0001	U				0.0001	U				0.00163					0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium					0.002	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Vanadium					--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Zinc					5	0.0079					0.005	U				0.0107					0.0064					0.005	U				0.005	U				0.0129					0.01				
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)																																										
1,1,1-Trichloroethane					200	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2,2-Tetrachloroethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2-Trichloroethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1-Dichloroethane					1	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			

Groundwater Analytical Summary - Shallow Wells: Second Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																										Upgradient Wells									
						G-01A					G-04A					G-08D1					G-09S					G-10S					G-11S					G-14S					G-24S				
						5/12/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)																																									
1,1-Dichloroethylene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2,3-Trichloropropane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dibromo-3-chloropropane					0.2	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
1,2-Dibromoethane					0.001	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
1,2-Dichlorobenzene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dichloroethane					0.5	0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U			
1,2-Dichloropropane					0.6	0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U			
1,4-Dichlorobenzene					4	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
2-Butanone					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
2-Hexanone					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
4-Methyl-2-Pentanone (MIBK)					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Acetone					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Acrylonitrile					0.07	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Benzene					1	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Bromodichloromethane					0.3	0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U			
Bromoform					5	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Bromomethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Disulfide					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Tetrachloride					0.3	0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U			
Chlorobenzene					--	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
Chlorodibromomethane					0.5	0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U			
Chloroethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Chloroform					7	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Chloromethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
cis-1,2-Dichloroethene					--	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
cis-1,3-Dichloropropene					0.2	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
Dibromomethane					--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Ethyl Benzene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
m,p-Xylene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Methyl Iodide					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Methylene Chloride					5	2.0	U				2.0	U				2.0	U				2.0	U				2.0	U				2.0	U				2.0	U				2.0	U			
o-Xylene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Styrene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Tetrachloroethylene					0.8	0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U			
Toluene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
trans-1,2-Dichloroethene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
trans-1,3-Dichloropropene					0.2	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
trans-1,4-Dichloro-2-butene					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Trichlorethene (1,1,2-Trichloroethylene)					3	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Trichlorofluoromethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Vinyl Acetate					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Vinyl Chloride					0.02	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in purple exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Alkalinity (as caco3)	mg/L	G-01A	05/12/2020		40.0000		200.0000
Ammonia nitrogen	mg-N/L	G-01A	05/12/2020	ND	0.0200		16.6482
Bicarbonate	mg/L	G-01A	05/12/2020		40.0000		200.0000
Chemical oxygen demand	mg/L	G-01A	05/12/2020		12.0000	**	16.0000
Chloride	mg/L	G-01A	05/12/2020		0.0800		18.3000
Conductivity	umhos/cm	G-01A	05/12/2020		130.0000		540.0000
Dissolved antimony	mg/L	G-01A	05/12/2020	ND	0.0003		0.0019
Dissolved arsenic	mg/L	G-01A	05/12/2020		0.0002		0.0038
Dissolved barium	mg/L	G-01A	05/12/2020	ND	0.0050		2.8609
Dissolved beryllium	mg/L	G-01A	05/12/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-01A	05/12/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-01A	05/12/2020		13.2000		23.8526
Dissolved chromium	mg/L	G-01A	05/12/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-01A	05/12/2020	ND	0.0100		0.0030
Dissolved copper	mg/L	G-01A	05/12/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-01A	05/12/2020	ND	0.0500		10.4257
Dissolved lead	mg/L	G-01A	05/12/2020	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-01A	05/12/2020		3.4200		53.3909
Dissolved manganese	mg/L	G-01A	05/12/2020	ND	0.0050		6.9361
Dissolved nickel	mg/L	G-01A	05/12/2020	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-01A	05/12/2020		0.6700		2.7509
Dissolved selenium	mg/L	G-01A	05/12/2020	ND	0.0005		0.0020
Dissolved silver	mg/L	G-01A	05/12/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-01A	05/12/2020		5.4300		123.0000
Dissolved thallium	mg/L	G-01A	05/12/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-01A	05/12/2020	ND	0.0100		0.0050
Dissolved zinc	mg/L	G-01A	05/12/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-01A	05/12/2020		0.0580		2.2263
Nitrite nitrogen	mg-N/L	G-01A	05/12/2020	ND	0.0020		36.8530
pH	std units	G-01A	05/12/2020		6.0400		6.00 - 9.39
Sulfate	mg/L	G-01A	05/12/2020		30.7000		169.0000
Total dissolved solids	mg/L	G-01A	05/12/2020		110.0000		404.5425
Total organic carbon	mg/L	G-01A	05/12/2020		2.7000		16.0000
Alkalinity (as caco3)	mg/L	G-04A	05/13/2020		150.0000	**	200.0000
Ammonia nitrogen	mg-N/L	G-04A	05/13/2020		0.3960		16.6482
Bicarbonate	mg/L	G-04A	05/13/2020		150.0000	**	200.0000
Chemical oxygen demand	mg/L	G-04A	05/13/2020		57.0000	*	16.0000
Chloride	mg/L	G-04A	05/13/2020		2.8600		18.3000
Conductivity	umhos/cm	G-04A	05/13/2020		370.0000		540.0000
Dissolved antimony	mg/L	G-04A	05/13/2020	ND	0.0003		0.0019
Dissolved arsenic	mg/L	G-04A	05/13/2020		0.0181	*	0.0038
Dissolved barium	mg/L	G-04A	05/13/2020		0.0076		2.8609
Dissolved beryllium	mg/L	G-04A	05/13/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-04A	05/13/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-04A	05/13/2020		44.4000	*	23.8526
Dissolved chromium	mg/L	G-04A	05/13/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-04A	05/13/2020		0.0110	*	0.0030
Dissolved copper	mg/L	G-04A	05/13/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-04A	05/13/2020		25.9000	*	10.4257
Dissolved lead	mg/L	G-04A	05/13/2020	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-04A	05/13/2020		26.7000		53.3909
Dissolved manganese	mg/L	G-04A	05/13/2020		6.0000		6.9361
Dissolved nickel	mg/L	G-04A	05/13/2020		0.0120		0.0380
Dissolved potassium	mg/L	G-04A	05/13/2020		1.8600		2.7509
Dissolved selenium	mg/L	G-04A	05/13/2020	ND	0.0005		0.0020
Dissolved silver	mg/L	G-04A	05/13/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-04A	05/13/2020		12.8000		123.0000
Dissolved thallium	mg/L	G-04A	05/13/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-04A	05/13/2020	ND	0.0100		0.0050
Dissolved zinc	mg/L	G-04A	05/13/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-04A	05/13/2020	ND	0.0100		2.2263
Nitrite nitrogen	mg-N/L	G-04A	05/13/2020	ND	0.0020		36.8530
pH	std units	G-04A	05/13/2020		6.2800		6.00 - 9.39
Sulfate	mg/L	G-04A	05/13/2020		31.2000		169.0000
Total dissolved solids	mg/L	G-04A	05/13/2020		220.0000		404.5425
Total organic carbon	mg/L	G-04A	05/13/2020		15.0000	**	16.0000
Alkalinity (as caco3)	mg/L	G-08D1	05/13/2020		160.0000		200.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Ammonia nitrogen	mg-N/L	G-08D1	05/13/2020		0.1090		16.6482
Bicarbonate	mg/L	G-08D1	05/13/2020		120.0000		200.0000
Chemical oxygen demand	mg/L	G-08D1	05/13/2020		15.0000		16.0000
Chloride	mg/L	G-08D1	05/13/2020		3.0100		18.3000
Conductivity	umhos/cm	G-08D1	05/13/2020		430.0000		540.0000
Dissolved antimony	mg/L	G-08D1	05/13/2020	ND	0.0003		0.0019
Dissolved arsenic	mg/L	G-08D1	05/13/2020		0.0013		0.0038
Dissolved barium	mg/L	G-08D1	05/13/2020		0.0067		2.8609
Dissolved beryllium	mg/L	G-08D1	05/13/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-08D1	05/13/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-08D1	05/13/2020		0.9000		23.8526
Dissolved chromium	mg/L	G-08D1	05/13/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-08D1	05/13/2020	ND	0.0100		0.0030
Dissolved copper	mg/L	G-08D1	05/13/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-08D1	05/13/2020		0.5510		10.4257
Dissolved lead	mg/L	G-08D1	05/13/2020		0.0002		0.0027
Dissolved magnesium	mg/L	G-08D1	05/13/2020	ND	0.2000		53.3909
Dissolved manganese	mg/L	G-08D1	05/13/2020		0.0120		6.9361
Dissolved nickel	mg/L	G-08D1	05/13/2020	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-08D1	05/13/2020	ND	0.5000		2.7509
Dissolved selenium	mg/L	G-08D1	05/13/2020	ND	0.0005		0.0020
Dissolved silver	mg/L	G-08D1	05/13/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-08D1	05/13/2020		104.0000		123.0000
Dissolved thallium	mg/L	G-08D1	05/13/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-08D1	05/13/2020	ND	0.0100		0.0050
Dissolved zinc	mg/L	G-08D1	05/13/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-08D1	05/13/2020		0.0600		2.2263
Nitrite nitrogen	mg-N/L	G-08D1	05/13/2020		0.0070		36.8530
pH	std units	G-08D1	05/13/2020		9.7600	***	6.00 - 9.39
Sulfate	mg/L	G-08D1	05/13/2020		44.1000		169.0000
Total dissolved solids	mg/L	G-08D1	05/13/2020		310.0000		404.5425
Total organic carbon	mg/L	G-08D1	05/13/2020		1.6000		16.0000
Alkalinity (as caco3)	mg/L	G-09S	05/12/2020		360.0000	***	200.0000
Ammonia nitrogen	mg-N/L	G-09S	05/12/2020		0.0270		16.6482
Bicarbonate	mg/L	G-09S	05/12/2020		360.0000	***	200.0000
Chemical oxygen demand	mg/L	G-09S	05/12/2020	ND	10.0000		16.0000
Chloride	mg/L	G-09S	05/12/2020		3.1700		18.3000
Conductivity	umhos/cm	G-09S	05/12/2020		990.0000	***	540.0000
Dissolved antimony	mg/L	G-09S	05/12/2020	ND	0.0003		0.0019
Dissolved arsenic	mg/L	G-09S	05/12/2020		0.0006		0.0038
Dissolved barium	mg/L	G-09S	05/12/2020	ND	0.0050		2.8609
Dissolved beryllium	mg/L	G-09S	05/12/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-09S	05/12/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-09S	05/12/2020		80.1000	***	23.8526
Dissolved chromium	mg/L	G-09S	05/12/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-09S	05/12/2020	ND	0.0100		0.0030
Dissolved copper	mg/L	G-09S	05/12/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-09S	05/12/2020	ND	0.0500		10.4257
Dissolved lead	mg/L	G-09S	05/12/2020	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-09S	05/12/2020		30.1000		53.3909
Dissolved manganese	mg/L	G-09S	05/12/2020		0.0480		6.9361
Dissolved nickel	mg/L	G-09S	05/12/2020		0.0180		0.0380
Dissolved potassium	mg/L	G-09S	05/12/2020		4.5500	***	2.7509
Dissolved selenium	mg/L	G-09S	05/12/2020	ND	0.0005		0.0020
Dissolved silver	mg/L	G-09S	05/12/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-09S	05/12/2020		93.0000		123.0000
Dissolved thallium	mg/L	G-09S	05/12/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-09S	05/12/2020	ND	0.0100	**	0.0050
Dissolved zinc	mg/L	G-09S	05/12/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-09S	05/12/2020	ND	0.0100		2.2263
Nitrite nitrogen	mg-N/L	G-09S	05/12/2020	ND	0.0020		36.8530
pH	std units	G-09S	05/12/2020		6.3400		6.00 - 9.39
Sulfate	mg/L	G-09S	05/12/2020		194.0000	***	169.0000
Total dissolved solids	mg/L	G-09S	05/12/2020		630.0000	***	404.5425
Total organic carbon	mg/L	G-09S	05/12/2020		4.8000		16.0000
Alkalinity (as caco3)	mg/L	G-10S	05/12/2020		450.0000	***	200.0000
Ammonia nitrogen	mg-N/L	G-10S	05/12/2020		0.2700		16.6482

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Bicarbonate	mg/L	G-10S	05/12/2020		450.0000	***	200.0000
Chemical oxygen demand	mg/L	G-10S	05/12/2020		15.0000		16.0000
Chloride	mg/L	G-10S	05/12/2020		7.2500		18.3000
Conductivity	umhos/cm	G-10S	05/12/2020		1400.0000	*	540.0000
Dissolved antimony	mg/L	G-10S	05/12/2020	ND	0.0003		0.0019
Dissolved arsenic	mg/L	G-10S	05/12/2020		0.0064	***	0.0038
Dissolved barium	mg/L	G-10S	05/12/2020		0.0059		2.8609
Dissolved beryllium	mg/L	G-10S	05/12/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-10S	05/12/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-10S	05/12/2020		101.0000	***	23.8526
Dissolved chromium	mg/L	G-10S	05/12/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-10S	05/12/2020	ND	0.0100		0.0030
Dissolved copper	mg/L	G-10S	05/12/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-10S	05/12/2020		10.5000	*	10.4257
Dissolved lead	mg/L	G-10S	05/12/2020	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-10S	05/12/2020		23.8000		53.3909
Dissolved manganese	mg/L	G-10S	05/12/2020		3.1400		6.9361
Dissolved nickel	mg/L	G-10S	05/12/2020	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-10S	05/12/2020		3.3700	***	2.7509
Dissolved selenium	mg/L	G-10S	05/12/2020	ND	0.0005		0.0020
Dissolved silver	mg/L	G-10S	05/12/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-10S	05/12/2020		191.0000	***	123.0000
Dissolved thallium	mg/L	G-10S	05/12/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-10S	05/12/2020	ND	0.0100		0.0050
Dissolved zinc	mg/L	G-10S	05/12/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-10S	05/12/2020	ND	0.0100		2.2263
Nitrite nitrogen	mg-N/L	G-10S	05/12/2020	ND	0.0020		36.8530
pH	std units	G-10S	05/12/2020		6.6800		6.00 - 9.39
Sulfate	mg/L	G-10S	05/12/2020		304.0000	***	169.0000
Total dissolved solids	mg/L	G-10S	05/12/2020		960.0000	***	404.5425
Total organic carbon	mg/L	G-10S	05/12/2020		4.0000		16.0000
Alkalinity (as caco3)	mg/L	G-11S	05/12/2020		74.0000		200.0000
Ammonia nitrogen	mg-N/L	G-11S	05/12/2020		0.0330		16.6482
Bicarbonate	mg/L	G-11S	05/12/2020		74.0000		200.0000
Chemical oxygen demand	mg/L	G-11S	05/12/2020	ND	10.0000		16.0000
Chloride	mg/L	G-11S	05/12/2020		3.5600		18.3000
Conductivity	umhos/cm	G-11S	05/12/2020		220.0000		540.0000
Dissolved antimony	mg/L	G-11S	05/12/2020	ND	0.0003		0.0019
Dissolved arsenic	mg/L	G-11S	05/12/2020		0.0006		0.0038
Dissolved barium	mg/L	G-11S	05/12/2020	ND	0.0050		2.8609
Dissolved beryllium	mg/L	G-11S	05/12/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-11S	05/12/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-11S	05/12/2020		8.0700		23.8526
Dissolved chromium	mg/L	G-11S	05/12/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-11S	05/12/2020	ND	0.0100		0.0030
Dissolved copper	mg/L	G-11S	05/12/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-11S	05/12/2020	ND	0.0500		10.4257
Dissolved lead	mg/L	G-11S	05/12/2020		0.0001		0.0027
Dissolved magnesium	mg/L	G-11S	05/12/2020		1.6900		53.3909
Dissolved manganese	mg/L	G-11S	05/12/2020		0.0210		6.9361
Dissolved nickel	mg/L	G-11S	05/12/2020	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-11S	05/12/2020		0.7300		2.7509
Dissolved selenium	mg/L	G-11S	05/12/2020	ND	0.0005		0.0020
Dissolved silver	mg/L	G-11S	05/12/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-11S	05/12/2020		43.3000		123.0000
Dissolved thallium	mg/L	G-11S	05/12/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-11S	05/12/2020	ND	0.0100		0.0050
Dissolved zinc	mg/L	G-11S	05/12/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-11S	05/12/2020	ND	0.0100		2.2263
Nitrite nitrogen	mg-N/L	G-11S	05/12/2020	ND	0.0020		36.8530
pH	std units	G-11S	05/12/2020		6.7400		6.00 - 9.39
Sulfate	mg/L	G-11S	05/12/2020		30.5000		169.0000
Total dissolved solids	mg/L	G-11S	05/12/2020		160.0000		404.5425

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Total organic carbon	mg/L	G-11S	05/12/2020		2.6000		16.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, Result = detection limit.

Table 5

Summary Statistics and Prediction Limits

Constituent	Units	Detect	N	Mean	SD	alpha	Factor	Pred Limit	Type		Conf
Alkalinity (as caco3)	mg/L	75	75					200.0000	nonpar		0.99
Ammonia nitrogen	mg-N/L	40	74	-2.1449	2.0702	0.0100	2.3945	16.6482	lognor		
Bicarbonate	mg/L	75	75					200.0000	nonpar		0.99
Chemical oxygen demand	mg/L	10	75					16.0000	nonpar		0.99
Chloride	mg/L	74	75					18.3000	nonpar		0.99
Conductivity	umhos/cm	74	74					540.0000	nonpar		0.99
Dissolved antimony	mg/L	35	75					0.0019	nonpar		0.99
Dissolved arsenic	mg/L	69	72	0.0014	0.0010	0.0100	2.3965	0.0038	normal		
Dissolved barium	mg/L	56	69	-4.7032	2.3980	0.0100	2.3996	2.8609	lognor		
Dissolved beryllium	mg/L	0	73					0.0005	nonpar	***	0.99
Dissolved cadmium	mg/L	32	71					0.0010	nonpar		0.99
Dissolved calcium	mg/L	73	73	7.1926	6.9548	0.0100	2.3955	23.8526	normal		
Dissolved chromium	mg/L	27	73					0.0150	nonpar		0.99
Dissolved cobalt	mg/L	4	74					0.0030	nonpar		0.99
Dissolved copper	mg/L	38	71					0.1150	nonpar		0.99
Dissolved iron	mg/L	49	72	-1.9660	1.7986	0.0100	2.3965	10.4257	lognor		
Dissolved lead	mg/L	34	75					0.0027	nonpar		0.99
Dissolved magnesium	mg/L	62	72	-0.0985	1.7009	0.0100	2.3965	53.3909	lognor		
Dissolved manganese	mg/L	53	71	-3.9360	2.4495	0.0100	2.3975	6.9361	lognor		
Dissolved nickel	mg/L	21	73					0.0380	nonpar		0.99
Dissolved potassium	mg/L	70	74	-0.6781	0.7058	0.0100	2.3945	2.7509	lognor		
Dissolved selenium	mg/L	4	75					0.0020	nonpar		0.99
Dissolved silver	mg/L	4	70					0.0002	nonpar		0.99
Dissolved sodium	mg/L	75	75					123.0000	nonpar		0.99
Dissolved thallium	mg/L	4	75					0.0001	nonpar		0.99
Dissolved vanadium	mg/L	0	75					0.0050	nonpar	***	0.99
Dissolved zinc	mg/L	33	74					0.0300	nonpar		0.99
Nitrate nitrogen	mg-N/L	68	73	-2.0713	1.1988	0.0100	2.3955	2.2263	lognor		
Nitrite nitrogen	mg-N/L	40	70	-3.2060	2.8404	0.0100	2.3985	36.8530	lognor		
pH	std units	75	75					6.00- 9.39	nonpar		0.99
Sulfate	mg/L	74	74					169.0000	nonpar		0.99
Total dissolved solids	mg/L	75	75	282.2667	51.0848	0.0100	2.3936	404.5425	normal		
Total organic carbon	mg/L	67	75					16.0000	nonpar		0.99

Conf = confidence level for passing initial test or one of two verification resamples at all downgradient wells for a single constituent (nonparametric test only).
* - Insufficient Data.
** - Calculated limit raised to Manual Reporting Limit.
*** - Nonparametric limit based on ND value.
For transformed data, mean and SD in transformed units and prediction limit in original units.
All sample sizes and statistics are based on outlier free data.
For nonparametric limits, median reporting limits are substituted for extreme reporting limit values.

Groundwater Analytical Summary - Shallow Wells: Third Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09S					G-10S				
						8/5/20	D	V	Tr	Ch	8/5/20	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)															
Alkalinity (as CaCO3)	nonpar	77	77	200	--	350		V	I	N	490		V		
Ammonia Nitrogen	lognor	73	42	16.6482	--	0.02	U				0.247			I	N
Bicarbonate	nonpar	77	77	200	--	350		V	I	N	490		V		
Calcium, Dissolved	normal	75	75	23.8526	--	88.2		V	D	N	100		V	D	N
Chemical Oxygen Demand	nonpar	77	10	16	--	18		E			26		E		
Chloride	nonpar	77	76	18.3	250	4.03			D	N	8.71			D	N
Conductivity (umhos/cm)	nonpar	76	76	540	700	1000		V	D	N	1400		E		
Magnesium, Dissolved	lognor	73	64	53.3909	--	33.0			D	N	23.8			D	N
Nitrate Nitrogen (mg-N/L)	lognor	74	69	2.2263	10	0.022					0.01	U			
Nitrite Nitrogen (mg-N/L)	lognor	69	43	36.85	1	0.002	U				0.002	U			
pH (std units)	normal	77	77	6.00-9.39	6.5-8.5	6.51			I	Y	6.86				
Potassium, Dissolved	lognor	75	74	2.7509	--	5.55		V	D	N	4.18		V		
Sodium, Dissolved	normal	75	75	123	20	96.0				Y	168		V		
Sulfate	normal	76	76	169	250	209		V	D	N	288		V	D	Y
Total Dissolved Solids	normal	77	77	404.5425	500	720		V	D	N	950		V		
Total Organic Carbon	nonpar	77	68	16	--	7.5					6.1				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony	nonpar	77	34	0.0019	0.006	0.0003	U				0.0003	U			
Arsenic	nonpar	72	68	0.0038	0.00005	0.000703					0.00516		V	I	N
Barium	lognor	70	55	2.8609	1	0.005	U		D	Y	0.005	U			
Beryllium	nonpar	77	0	0.0005	0.004	0.005	U				0.005	U			
Cadmium	nonpar	72	35	0.001	0.005	0.00005	U				0.00005	U			
Chromium	nonpar	75	28	0.015	0.05	0.01	U				0.01	U			
Cobalt	nonpar	76	5	0.003	--	0.01	U				0.01	U			
Copper	nonpar	73	39	0.115	1	0.01	U		D	Y	0.01	U			
Iron	lognor	74	46	10.4257	0.3	0.05	U				9.76		P	I	N
Lead	nonpar	77	33	0.0027	0.05	0.0001	U				0.0001	U			
Manganese	lognor	70	55	6.9361	0.05	0.044					3.19			D	N
Nickel	nonpar	75	19	0.038	0.1	0.218		E			0.152		E		
Selenium	nonpar	76	6	0.002	0.01	0.0005	U				0.0005	U			
Silver	nonpar	71	4	0.0002	0.05	0.0001	U				0.0001	U			
Thallium	nonpar	76	6	0.0001	0.002	0.00005	U				0.00005	U			
Vanadium	nonpar	77	2	0.005	--	0.01	U				0.01	U			
Zinc	nonpar	76	33	0.03	5	0.01	U				0.01	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony					0.006	0.0003	U				0.0003	U			
Arsenic					0.00005	0.000891					0.00575				
Barium					1	0.0077					0.005	U			
Beryllium					0.004	0.005	U				0.005	U			
Cadmium					0.005	0.000054					0.00005	U			
Chromium					0.05	0.01	U				0.01	U			
Cobalt					--	0.01	U				0.01	U			
Copper					1	0.01	U				0.01	U			
Iron					0.3	0.848					11.0				
Lead					0.05	0.000899					0.0001	U			
Manganese					0.05	0.11					3.39				
Nickel					0.1	0.062					0.03				
Selenium					0.01	0.00005	U				0.00063				
Silver					0.05	0.00172					0.0001	U			
Thallium					0.002	0.0001	U				0.0001	U			
Vanadium					--	0.01					0.01	U			
Zinc					5	0.005					0.005	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)															
1,1,1-Trichloroethane					200	1	U				1	U			
1,1,2,2-Tetrachloroethane					--	1	U				1	U			
1,1,2-Trichloroethane					--	1	U				1	U			
1,1-Dichloroethane					1	1	U				1	U			
1,1-Dichloroethylene					--	1	U				1	U			
1,2,3-Trichloropropane					--	1	U				1	U			
1,2-Dibromo-3-chloropropane					0.2	5	U				5	U			
1,2-Dibromoethane					0.001	0.01	U				0.01	U			
1,2-Dichlorobenzene					--	1	U				1	U			

Groundwater Analytical Summary - Shallow Wells: Third Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09S					G-10S				
						8/5/20	D	V	Tr	Ch	8/5/20	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)															
1,2-Dichloroethane					0.5	0.5	U				0.5	U			
1,2-Dichloropropane					0.6	0.6	U				0.6	U			
1,4-Dichlorobenzene					4	1	U				1	U			
2-Butanone					–	5	U				5	U			
2-Hexanone					–	5	U				5	U			
4-Methyl-2-Pentanone (MIBK)					–	5	U				5	U			
Acetone					–	5	U				5	U			
Acrylonitrile					0.07	0.01	U				0.01	U			
Benzene					1	1	U				1	U			
Bromodichloromethane					0.3	0.3	U				0.3	U			
Bromoform					5	1	U				1	U			
Bromomethane					–	1	U				1	U			
Carbon Disulfide					–	1	U				1	U			
Carbon Tetrachloride					0.3	0.3	U				0.3	U			
Chlorobenzene					–	0.2	U				0.2	U			
Chlorodibromomethane					0.5	0.5	U				0.5	U			
Chloroethane					–	1	U				1	U			
Chloroform					7	1	U				1	U			
Chloromethane					–	1	U				1	U			
cis-1,2-Dichloroethene					–	0.2	U				0.2	U			
cis-1,3-Dichloropropene					0.2	0.2	U				0.2	U			
Dibromomethane					–	0.01	U				0.01	U			
Ethyl Benzene					–	1	U				1	U			
m,p-Xylene					–	1	U				1	U			
Methyl Iodide					–	1	U				1	U			
Methylene Chloride					5	5.6	B				5.0	B			
o-Xylene					–	1	U				1	U			
Styrene					–	1	U				1	U			
Tetrachloroethylene					0.8	0.8	U				0.8	U			
Toluene					–	1	U				1	U			
trans-1,2-Dichloroethene					–	1	U				1	U			
trans-1,3-Dichloropropene					0.2	0.2	U				0.2	U			
trans-1,4-Dichloro-2-butene					–	5	U				5	U			
Trichlorethene (1,1,2-Trichloroethylene)					3	1	U				1	U			
Trichlorofluoromethane					–	1	U				1	U			
Vinyl Acetate					–	5	U				5	U			
Vinyl Chloride					0.02	0.04					0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in purple exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards - the most restrictive of the two is used.

B = Methylene chloride was measured in the lab blank at a similar concentration - contamination during analysis suspected.

Groundwater Analytical Summary - Shallow Wells: Fourth Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																										Upgradient Wells									
						G-01A					G-04A					G-08D1					G-09S					G-10S					G-11S					G-14S					G-24S				
						10/15/20	D	V	Tr	Ch	10/15/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/15/20	D	V	Tr	Ch	10/15/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)																																											
Alkalinity (as CaCO3)	nonpar	75	75	200	--	34					230		E			180					330		V	I	N	470		V			80				Y	220					230				
Ammonia Nitrogen	lognor	74	40	16.6482	--	0.072					0.191					0.172					0.02	U				0.254				Y	0.036					0.161					0.042				
Bicarbonate	nonpar	75	75	200	--	34					230		E			80					330		V	I	N	470		V			80				Y	170					200				
Calcium, Dissolved	normal	73	73	23.8526	--	14.9					46.5		V			0.72			I	N	83.2		V	D	N	96		V	D	N	11.5			I	Y	0.62				Y	7.51			D	N
Chemical Oxygen Demand	nonpar	75	10	16	--	10	U				10	U	P			10	U				10	U	P			10	U	P			10	U				10	U				10	U			
Chloride	nonpar	75	74	18.3	250	2.48					5.51			I	N	3.16			D	N	3.86			D	N	8.61			D	N	5.29					2.09			D	Y	5.7			D	Y
Conductivity (umhos/cm)	nonpar	74	74	540	700	160					510					460					1000		V	D	N	1400		V			250			D	N	410				Y	420				
Magnesium, Dissolved	lognor	72	62	53.3909	--	3.98					27.1					0.2	U				32.3			D	N	23.2			D	N	2.58			I	Y	0.2	U				2.08			D	N
Nitrate Nitrogen (mg-N/L)	lognor	73	68	2.2263	10	0.39					0.01	U				0.47					0.01	U				0.027					0.01	U				0.022			D	N	0.036				
Nitrite Nitrogen (mg-N/L)	lognor	70	40	36.85	1	0.002	U				0.002	U				0.003			D	N	0.002	U				0.002	U				0.002	U				0.002	U				0.002	U			
pH (std units)	nonpar	75	75	6.00-9.39	6.5-8.5	6.01					6.71					9.67		V			6.87			I	N	7.03					6.73					9.18			I	N	7.64				
Potassium, Dissolved	lognor	74	70	2.7509	--	1.21					2.42			I	N	0.5	U		I	N	5.16		V	D	N	3.5		V			1.06					0.5	U				0.74				
Sodium, Dissolved	nonpar	75	75	123	20	6.77				Y	14.4					110					93.1				Y	169		V			41.0			D	N	105.0				Y	96.6				
Sulfate	nonpar	74	74	169	250	36.0					32.3					49.1					197		E	D	N	282		E	D	N	29.0			D	N	12.7			D	N	74.9				
Total Dissolved Solids	normal	75	75	404.5425	500	120					330					300					700		V	D	N	930		V			160				Y	260				Y	290				
Total Organic Carbon	nonpar	75	67	16	--	5.2					8.6		P			1.3					4.2					6.1				Y	3.2					1.6					2.0				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)																																											
Antimony	nonpar	75	35	0.0019	0.006	0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U			
Arsenic	normal	72	69	0.0038	0.00005	0.000185					0.0108		V	I	N	0.00186					0.000511					0.00396		V		Y	0.000479					0.00341			I	N	0.000765				Y
Barium	lognor	69	56	2.8609	1	0.005	U				0.005	U				0.005	U				0.005	U			Y	0.005	U				0.005	U				0.005	U				0.005	U		D	N
Beryllium	nonpar	73	0	0.0005	0.004	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium	nonpar	71	32	0.001	0.005	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Chromium	nonpar	73	27	0.015	0.05	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt	nonpar	74	4	0.003	--	0.01	U				0.011		V			0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Copper	nonpar	71	38	0.115	1	0.01	U				0.01	U				0.01	U				0.014				Y	0.01	U				0.01	U			Y	0.01	U				0.01	U			
Iron	lognor	72	49	10.4257	0.3	0.05	U				16.9		V	I	N	0.05	U		I	N	0.05	U				8.03				Y	0.05	U				0.05	U			Y	0.05	U				
Lead	nonpar	75	34	0.0027	0.05	0.000174					0.0001	U				0.0001	U				0.000183					0.000116					0.0001	U				0.0001	U				0.0005				
Manganese	lognor	71	53	6.9361	0.05	0.005	U				6.83					0.005	U				0.016					3.1			D	N	0.044			I	N	0.005	U		I	Y	0.005	U			
Nickel	nonpar	73	21	0.038	0.1	0.01	U				0.012					0.01	U				0.016		P			0.01	U	P			0.01	U				0.01	U				0.01	U			
Selenium	nonpar	75	4	0.002	0.01	0.0005	U				0.0005	U				0.0005	U				0.0005	U		D	Y	0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver	nonpar	70	4	0.0002	0.05	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium	nonpar	75	4	0.0001	0.002	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Vanadium	nonpar	75	0	0.005	--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Zinc	nonpar	74	33	0.03	5	0.01	U				0.01	U				0.01	U				0.01					0.01	U				0.01	U				0.01	U				0.01	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)																																											
Antimony					0.006	0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U			
Arsenic					0.00005	0.000435					0.0188					0.000999					0.000668					0.0051					0.000404					0.003					0.0007				
Barium					1	0.005					0.0071					0.0123					0.005	U				0.0066					0.005	U				0.0226					0.005	U			
Beryllium					0.004	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium					0.005	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Chromium					0.05	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.0136					0.01	U			
Cobalt					--	0.01	U				0.015					0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Copper					1	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Iron					0.3	0.51					16.7					3.39					0.213					9.45					0.05	U				4.18					0.406				
Lead					0.05	0.0001	U				0.0001	U				0.000513					0.000356					0.0001	U				0.0001	U				0.000476					0.000253				
Manganese					0.05	0.0279					6.45					0.0557					0.0923					3.23					0.105					0.123					0.0211				
Nickel					0.1	0.01	U				0.013					0.01	U				0.02					0.01	U				0.01	U				0.012					0.01	U			
Selenium					0.01	0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver					0.05	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium					0.002	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Vanadium					--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Zinc					5	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)																																											
1,1,1-Trichloroethane					200	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2,2-Tetrachloroethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2-Trichloroethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1-Dichloroethane					1	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			

Groundwater Analytical Summary - Shallow Wells: Fourth Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																						Upgradient Wells									
						G-01A					G-04A					G-08D1					G-09S					G-10S					G-11S					G-14S					G-24S				
						10/15/20	D	V	Tr	Ch	10/15/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/15/20	D	V	Tr	Ch	10/15/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)																																											
1,1-Dichloroethylene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2,3-Trichloropropane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dibromo-3-chloropropane					0.2	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
1,2-Dibromoethane					0.001	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
1,2-Dichlorobenzene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dichloroethane					0.5	0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U			
1,2-Dichloropropane					0.6	0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U			
1,4-Dichlorobenzene					4	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
2-Butanone					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
2-Hexanone					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
4-Methyl-2-Pentanone (MIBK)					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Acetone					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Acrylonitrile					0.07	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Benzene					1	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Bromodichloromethane					0.3	0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U			
Bromoform					5	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Bromomethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Disulfide					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Tetrachloride					0.3	0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U			
Chlorobenzene					--	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
Chlorodibromomethane					0.5	0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U			
Chloroethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Chloroform					7	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Chloromethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
cis-1,2-Dichloroethene					--	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
cis-1,3-Dichloropropene					0.2	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
Dibromomethane					--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Ethyl Benzene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
m,p-Xylene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Methyl Iodide					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Methylene Chloride					5	2.0	U				2.0	U				2.0	U				2.0	U				2.0	U				2.0	U				2.0	U				2.0	U			
o-Xylene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Styrene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Tetrachloroethylene					0.8	0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U			
Toluene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
trans-1,2-Dichloroethene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
trans-1,3-Dichloropropene					0.2	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
trans-1,4-Dichloro-2-butene					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Trichlorethene (1,1,2-Trichloroethylene)					3	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Trichlorofluoromethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Vinyl Acetate					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Vinyl Chloride					0.02	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in purple exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Alkalinity (as caco3)	mg/L	G-01A	10/15/2020		34.0000		230.0000
Ammonia nitrogen	mg-N/L	G-01A	10/15/2020		0.0720		12.5375
Bicarbonate	mg/L	G-01A	10/15/2020		34.0000		200.0000
Chemical oxygen demand	mg/L	G-01A	10/15/2020	ND	10.0000		16.0000
Chloride	mg/L	G-01A	10/15/2020		2.4800		18.3000
Conductivity	umhos/cm	G-01A	10/15/2020		160.0000		548.9315
Dissolved antimony	mg/L	G-01A	10/15/2020	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-01A	10/15/2020		0.0002		0.0035
Dissolved barium	mg/L	G-01A	10/15/2020	ND	0.0050		3.7002
Dissolved beryllium	mg/L	G-01A	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-01A	10/15/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-01A	10/15/2020		14.9000		23.8179
Dissolved chromium	mg/L	G-01A	10/15/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-01A	10/15/2020	ND	0.0100		0.0030
Dissolved copper	mg/L	G-01A	10/15/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-01A	10/15/2020	ND	0.0500		9.8243
Dissolved lead	mg/L	G-01A	10/15/2020		0.0002		0.0027
Dissolved magnesium	mg/L	G-01A	10/15/2020		3.9800		51.3609
Dissolved manganese	mg/L	G-01A	10/15/2020	ND	0.0050		6.4627
Dissolved nickel	mg/L	G-01A	10/15/2020	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-01A	10/15/2020		1.2100		2.6321
Dissolved selenium	mg/L	G-01A	10/15/2020	ND	0.0005		0.0003
Dissolved silver	mg/L	G-01A	10/15/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-01A	10/15/2020		6.7700		121.6395
Dissolved thallium	mg/L	G-01A	10/15/2020	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-01A	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-01A	10/15/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-01A	10/15/2020		0.3900		1.3000
Nitrite nitrogen	mg-N/L	G-01A	10/15/2020	ND	0.0020		0.0210
pH	std units	G-01A	10/15/2020		6.0100		6.00 - 9.39
Sulfate	mg/L	G-01A	10/15/2020		36.0000		338.8047
Total dissolved solids	mg/L	G-01A	10/15/2020		120.0000		397.5917
Total organic carbon	mg/L	G-01A	10/15/2020		5.2000		14.0000
Alkalinity (as caco3)	mg/L	G-04A	10/15/2020		230.0000		230.0000
Ammonia nitrogen	mg-N/L	G-04A	10/15/2020		0.1910		12.5375
Bicarbonate	mg/L	G-04A	10/15/2020		230.0000	*	200.0000
Chemical oxygen demand	mg/L	G-04A	10/15/2020	ND	10.0000	**	16.0000
Chloride	mg/L	G-04A	10/15/2020		5.5100		18.3000
Conductivity	umhos/cm	G-04A	10/15/2020		510.0000		548.9315
Dissolved antimony	mg/L	G-04A	10/15/2020	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-04A	10/15/2020		0.0108	***	0.0035
Dissolved barium	mg/L	G-04A	10/15/2020	ND	0.0050		3.7002
Dissolved beryllium	mg/L	G-04A	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-04A	10/15/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-04A	10/15/2020		46.5000	***	23.8179
Dissolved chromium	mg/L	G-04A	10/15/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-04A	10/15/2020		0.0110	***	0.0030
Dissolved copper	mg/L	G-04A	10/15/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-04A	10/15/2020		16.9000	***	9.8243
Dissolved lead	mg/L	G-04A	10/15/2020	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-04A	10/15/2020		27.1000		51.3609
Dissolved manganese	mg/L	G-04A	10/15/2020		6.8300	*	6.4627
Dissolved nickel	mg/L	G-04A	10/15/2020		0.0120		0.0380
Dissolved potassium	mg/L	G-04A	10/15/2020		2.4200		2.6321
Dissolved selenium	mg/L	G-04A	10/15/2020	ND	0.0005		0.0003
Dissolved silver	mg/L	G-04A	10/15/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-04A	10/15/2020		14.4000		121.6395
Dissolved thallium	mg/L	G-04A	10/15/2020	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-04A	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-04A	10/15/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-04A	10/15/2020	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-04A	10/15/2020	ND	0.0020		0.0210
pH	std units	G-04A	10/15/2020		6.7100		6.00 - 9.39
Sulfate	mg/L	G-04A	10/15/2020		32.3000		338.8047
Total dissolved solids	mg/L	G-04A	10/15/2020		330.0000		397.5917
Total organic carbon	mg/L	G-04A	10/15/2020		8.6000	**	14.0000
Alkalinity (as caco3)	mg/L	G-08D1	10/14/2020		180.0000		230.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Ammonia nitrogen	mg-N/L	G-08D1	10/14/2020		0.1720		12.5375
Bicarbonate	mg/L	G-08D1	10/14/2020		80.0000		200.0000
Chemical oxygen demand	mg/L	G-08D1	10/14/2020	ND	10.0000		16.0000
Chloride	mg/L	G-08D1	10/14/2020		3.1600		18.3000
Conductivity	umhos/cm	G-08D1	10/14/2020		460.0000		548.9315
Dissolved antimony	mg/L	G-08D1	10/14/2020	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-08D1	10/14/2020		0.0019		0.0035
Dissolved barium	mg/L	G-08D1	10/14/2020	ND	0.0050		3.7002
Dissolved beryllium	mg/L	G-08D1	10/14/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-08D1	10/14/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-08D1	10/14/2020		0.7200		23.8179
Dissolved chromium	mg/L	G-08D1	10/14/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-08D1	10/14/2020	ND	0.0100		0.0030
Dissolved copper	mg/L	G-08D1	10/14/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-08D1	10/14/2020	ND	0.0500		9.8243
Dissolved lead	mg/L	G-08D1	10/14/2020	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-08D1	10/14/2020	ND	0.2000		51.3609
Dissolved manganese	mg/L	G-08D1	10/14/2020	ND	0.0050		6.4627
Dissolved nickel	mg/L	G-08D1	10/14/2020	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-08D1	10/14/2020	ND	0.5000		2.6321
Dissolved selenium	mg/L	G-08D1	10/14/2020	ND	0.0005		0.0003
Dissolved silver	mg/L	G-08D1	10/14/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-08D1	10/14/2020		110.0000		121.6395
Dissolved thallium	mg/L	G-08D1	10/14/2020	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-08D1	10/14/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-08D1	10/14/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-08D1	10/14/2020		0.4700		1.3000
Nitrite nitrogen	mg-N/L	G-08D1	10/14/2020		0.0030		0.0210
pH	std units	G-08D1	10/14/2020		9.6700	***	6.00 - 9.39
Sulfate	mg/L	G-08D1	10/14/2020		49.1000		338.8047
Total dissolved solids	mg/L	G-08D1	10/14/2020		300.0000		397.5917
Total organic carbon	mg/L	G-08D1	10/14/2020		1.3000		14.0000
Alkalinity (as caco3)	mg/L	G-09S	10/15/2020		330.0000	***	230.0000
Ammonia nitrogen	mg-N/L	G-09S	10/15/2020	ND	0.0200		12.5375
Bicarbonate	mg/L	G-09S	10/15/2020		330.0000	***	200.0000
Chemical oxygen demand	mg/L	G-09S	10/15/2020	ND	10.0000	**	16.0000
Chloride	mg/L	G-09S	10/15/2020		3.8600		18.3000
Conductivity	umhos/cm	G-09S	10/15/2020		1000.0000	***	548.9315
Dissolved antimony	mg/L	G-09S	10/15/2020	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-09S	10/15/2020		0.0005		0.0035
Dissolved barium	mg/L	G-09S	10/15/2020	ND	0.0050		3.7002
Dissolved beryllium	mg/L	G-09S	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-09S	10/15/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-09S	10/15/2020		83.2000	***	23.8179
Dissolved chromium	mg/L	G-09S	10/15/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-09S	10/15/2020	ND	0.0100		0.0030
Dissolved copper	mg/L	G-09S	10/15/2020		0.0140		0.1150
Dissolved iron	mg/L	G-09S	10/15/2020	ND	0.0500		9.8243
Dissolved lead	mg/L	G-09S	10/15/2020		0.0002		0.0027
Dissolved magnesium	mg/L	G-09S	10/15/2020		32.3000		51.3609
Dissolved manganese	mg/L	G-09S	10/15/2020		0.0160		6.4627
Dissolved nickel	mg/L	G-09S	10/15/2020		0.0160	**	0.0380
Dissolved potassium	mg/L	G-09S	10/15/2020		5.1600	***	2.6321
Dissolved selenium	mg/L	G-09S	10/15/2020	ND	0.0005		0.0003
Dissolved silver	mg/L	G-09S	10/15/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-09S	10/15/2020		93.1000		121.6395
Dissolved thallium	mg/L	G-09S	10/15/2020	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-09S	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-09S	10/15/2020		0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-09S	10/15/2020	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-09S	10/15/2020	ND	0.0020		0.0210
pH	std units	G-09S	10/15/2020		6.8700		6.00 - 9.39
Sulfate	mg/L	G-09S	10/15/2020		197.0000		338.8047
Total dissolved solids	mg/L	G-09S	10/15/2020		700.0000	***	397.5917
Total organic carbon	mg/L	G-09S	10/15/2020		4.2000		14.0000
Alkalinity (as caco3)	mg/L	G-10S	10/15/2020		470.0000	***	230.0000
Ammonia nitrogen	mg-N/L	G-10S	10/15/2020		0.2540		12.5375

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Bicarbonate	mg/L	G-10S	10/15/2020		470.0000	***	200.0000
Chemical oxygen demand	mg/L	G-10S	10/15/2020	ND	10.0000	**	16.0000
Chloride	mg/L	G-10S	10/15/2020		8.6100		18.3000
Conductivity	umhos/cm	G-10S	10/15/2020		1400.0000	***	548.9315
Dissolved antimony	mg/L	G-10S	10/15/2020	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-10S	10/15/2020		0.0040	***	0.0035
Dissolved barium	mg/L	G-10S	10/15/2020	ND	0.0050		3.7002
Dissolved beryllium	mg/L	G-10S	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-10S	10/15/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-10S	10/15/2020		96.0000	***	23.8179
Dissolved chromium	mg/L	G-10S	10/15/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-10S	10/15/2020	ND	0.0100		0.0030
Dissolved copper	mg/L	G-10S	10/15/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-10S	10/15/2020		8.0300		9.8243
Dissolved lead	mg/L	G-10S	10/15/2020		0.0001		0.0027
Dissolved magnesium	mg/L	G-10S	10/15/2020		23.2000		51.3609
Dissolved manganese	mg/L	G-10S	10/15/2020		3.1000		6.4627
Dissolved nickel	mg/L	G-10S	10/15/2020	ND	0.0100	**	0.0380
Dissolved potassium	mg/L	G-10S	10/15/2020		3.5000	***	2.6321
Dissolved selenium	mg/L	G-10S	10/15/2020	ND	0.0005		0.0003
Dissolved silver	mg/L	G-10S	10/15/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-10S	10/15/2020		169.0000	***	121.6395
Dissolved thallium	mg/L	G-10S	10/15/2020	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-10S	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-10S	10/15/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-10S	10/15/2020		0.0270		1.3000
Nitrite nitrogen	mg-N/L	G-10S	10/15/2020	ND	0.0020		0.0210
pH	std units	G-10S	10/15/2020		7.0300		6.00 - 9.39
Sulfate	mg/L	G-10S	10/15/2020		282.0000		338.8047
Total dissolved solids	mg/L	G-10S	10/15/2020		930.0000	***	397.5917
Total organic carbon	mg/L	G-10S	10/15/2020		6.1000		14.0000
Alkalinity (as caco3)	mg/L	G-11S	10/14/2020		80.0000		230.0000
Ammonia nitrogen	mg-N/L	G-11S	10/14/2020		0.0360		12.5375
Bicarbonate	mg/L	G-11S	10/14/2020		80.0000		200.0000
Chemical oxygen demand	mg/L	G-11S	10/14/2020	ND	10.0000		16.0000
Chloride	mg/L	G-11S	10/14/2020		5.2900		18.3000
Conductivity	umhos/cm	G-11S	10/14/2020		250.0000		548.9315
Dissolved antimony	mg/L	G-11S	10/14/2020	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-11S	10/14/2020		0.0005		0.0035
Dissolved barium	mg/L	G-11S	10/14/2020	ND	0.0050		3.7002
Dissolved beryllium	mg/L	G-11S	10/14/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-11S	10/14/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-11S	10/14/2020		11.5000		23.8179
Dissolved chromium	mg/L	G-11S	10/14/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-11S	10/14/2020	ND	0.0100		0.0030
Dissolved copper	mg/L	G-11S	10/14/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-11S	10/14/2020	ND	0.0500		9.8243
Dissolved lead	mg/L	G-11S	10/14/2020	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-11S	10/14/2020		2.5800		51.3609
Dissolved manganese	mg/L	G-11S	10/14/2020		0.0440		6.4627
Dissolved nickel	mg/L	G-11S	10/14/2020	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-11S	10/14/2020		1.0600		2.6321
Dissolved selenium	mg/L	G-11S	10/14/2020	ND	0.0005		0.0003
Dissolved silver	mg/L	G-11S	10/14/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-11S	10/14/2020		41.0000		121.6395
Dissolved thallium	mg/L	G-11S	10/14/2020	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-11S	10/14/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-11S	10/14/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-11S	10/14/2020	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-11S	10/14/2020	ND	0.0020		0.0210
pH	std units	G-11S	10/14/2020		6.7300		6.00 - 9.39
Sulfate	mg/L	G-11S	10/14/2020		29.0000		338.8047
Total dissolved solids	mg/L	G-11S	10/14/2020		160.0000		397.5917

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Total organic carbon	mg/L	G-11S	10/14/2020		3.2000		14.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, Result = detection limit.

Table 5

Summary Statistics and Prediction Limits

Constituent	Units	Detect	N	Mean	SD	alpha	Factor	Pred Limit	Type		Conf
Alkalinity (as caco3)	mg/L	69	69					230.0000	nonpar		0.99
Ammonia nitrogen	mg-N/L	41	69	-2.2960	2.0106	0.0100	2.3996	12.5375	lognor		
Bicarbonate	mg/L	69	69					200.0000	nonpar		0.99
Chemical oxygen demand	mg/L	10	69					16.0000	nonpar		0.99
Chloride	mg/L	68	69					18.3000	nonpar		0.99
Conductivity	umhos/cm	68	68	418.3824	54.3787	0.0100	2.4007	548.9315	normal		
Dissolved antimony	mg/L	32	67					0.0006	nonpar		0.99
Dissolved arsenic	mg/L	69	69					0.0035	nonpar		0.99
Dissolved barium	mg/L	54	68	-4.6000	2.4611	0.0100	2.4007	3.7002	lognor		
Dissolved beryllium	mg/L	0	65					0.0005	nonpar	***	0.99
Dissolved cadmium	mg/L	30	69					0.0010	nonpar		0.99
Dissolved calcium	mg/L	67	67	7.1127	6.9550	0.0100	2.4019	23.8179	normal		
Dissolved chromium	mg/L	26	69					0.0150	nonpar		0.99
Dissolved cobalt	mg/L	4	69					0.0030	nonpar		0.99
Dissolved copper	mg/L	36	68					0.1150	nonpar		0.99
Dissolved iron	mg/L	48	69	-1.9861	1.7798	0.0100	2.3996	9.8243	lognor		
Dissolved lead	mg/L	33	69					0.0027	nonpar		0.99
Dissolved magnesium	mg/L	58	68	-0.1479	1.7023	0.0100	2.4007	51.3609	lognor		
Dissolved manganese	mg/L	52	69	-3.9782	2.4355	0.0100	2.3996	6.4627	lognor		
Dissolved nickel	mg/L	20	69					0.0380	nonpar		0.99
Dissolved potassium	mg/L	63	68	-0.6160	0.6597	0.0100	2.4007	2.6321	lognor		
Dissolved selenium	mg/L	1	65					0.0003	nonpar		0.99
Dissolved silver	mg/L	3	66					0.0002	nonpar		0.99
Dissolved sodium	mg/L	69	69	89.8551	13.2456	0.0100	2.3996	121.6395	normal		
Dissolved thallium	mg/L	3	69					0.0000	nonpar		0.99
Dissolved vanadium	mg/L	0	69					0.0100	nonpar	***	0.99
Dissolved zinc	mg/L	31	69					0.0300	nonpar		0.99
Nitrate nitrogen	mg-N/L	65	69					1.3000	nonpar		0.99
Nitrite nitrogen	mg-N/L	39	69					0.0210	nonpar		0.99
pH	std units	70	70					6.00- 9.39	nonpar		0.99
Sulfate	mg/L	68	68	3.8047	0.8417	0.0100	2.4007	338.8047	lognor		
Total dissolved solids	mg/L	69	69	279.8551	49.0646	0.0100	2.3996	397.5917	normal		
Total organic carbon	mg/L	63	69					14.0000	nonpar		0.99

Conf = confidence level for passing initial test or one of two verification resamples at all downgradient wells for a single constituent (nonparametric test only).
* - Insufficient Data.
** - Calculated limit raised to Manual Reporting Limit.
*** - Nonparametric limit based on ND value.
For transformed data, mean and SD in transformed units and prediction limit in original units.
All sample sizes and statistics are based on outlier free data.
For nonparametric limits, median reporting limits are substituted for extreme reporting limit values.

Deep Wells

Groundwater Analytical Summary - Deep Wells: First Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09D					G-10D				
						1/7/20	D	V	Tr	Ch	1/7/20	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)															
Alkalinity (as CaCO3)	nonpar	66	66	280	--	220					510				
Ammonia Nitrogen	nonpar	59	59	0.57	--	0.175					0.348				
Bicarbonate	nonpar	66	66	280	--	200					510				
Calcium, Dissolved	nonpar	63	63	6.32	--	1.89				Y	22.6			D	N
Chemical Oxygen Demand	nonpar	66	16	160	--	12					15				
Chloride	lognor	66	65	9.4402	250	21.2					19.1			D	N
Conductivity (umhos/cm)	nonpar	66	66	510	700	840					1600				
Magnesium, Dissolved	nonpar	62	40	0.31	--	0.2	U				1.96			D	N
Nitrate Nitrogen (mg-N/L)	nonpar	65	14	0.21	10	0.059			D	Y	0.012				
Nitrite Nitrogen (mg-N/L)	nonpar	59	29	0.6	1	0.008					0.013				
pH (std units)	nonpar	65	65	6.02-10.02	6.5-8.5	9.03					6.85				
Potassium, Dissolved	nonpar	66	62	1.6	--	0.67					1.59				
Sodium, Dissolved	nonpar	63	63	119	20	202					348				Y
Sulfate	nonpar	65	65	66.05	250	166					317				
Total Dissolved Solids	nonpar	66	66	480	500	490					1000				
Total Organic Carbon	nonpar	66	62	63	--	4.4					5.5				Y
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony	nonpar	66	11	0.01	0.006	0.0003	U				0.0003	U			
Arsenic	lognor	62	45	29.9523	0.00005	0.00251					0.0015				
Barium	nonpar	63	13	0.0037	1	0.0075					0.0112				
Beryllium	nonpar	66	0	0.0005	0.004	0.0005	U				0.0005	U			
Cadmium	nonpar	58	9	0.0001	0.005	0.00005	U				0.00005	U			
Chromium	nonpar	66	8	0.0136	0.05	0.005	U				0.0061				
Cobalt	nonpar	66	4	0.004	--	0.005	U				0.005	U			
Copper	nonpar	63	10	0.008	1	0.005	U				0.005	U			
Iron	lognor	60	30	21.2604	0.3	0.17			I	Y	0.631			I	Y
Lead	nonpar	66	20	0.0023	0.05	0.000417			D	N	0.0001	U			
Manganese	lognor	57	43	6.1166	0.05	0.017					0.397			D	N
Nickel	nonpar	65	2	0.006	0.1	0.005					0.005				
Selenium	nonpar	65	16	0.0025	0.01	0.00032					0.0003	U			
Silver	nonpar	62	6	0.0007	0.05	0.0001	U				0.0001	U			
Thallium	nonpar	65	7	0.003	0.002	0.00005	U				0.00005	U			
Vanadium	nonpar	66	0	0.005	--	0.01	U				0.011				
Zinc	nonpar	65	17	0.012	5	0.005	U				0.005	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony					0.006	0.0003	U				0.0003	U			
Arsenic					0.00005	0.00198					0.00131				
Barium					1	0.005	U				0.005	U			
Beryllium					0.004	0.0005	U				0.0005	U			
Cadmium					0.005	0.00005	U				0.00005	U			
Chromium					0.05	0.0121					0.005	U			
Cobalt					--	0.005	U				0.005	U			
Copper					1	0.024					0.005	U			
Iron					0.3	0.262					0.61				
Lead					0.05	0.000674					0.0001	U			
Manganese					0.05	0.0383					0.38				
Nickel					0.1	0.005	U				0.005	U			
Selenium					0.01	0.0003	U				0.0003	U			
Silver					0.05	0.0001	U				0.0001	U			
Thallium					0.002	0.00005	U				0.00005	U			
Vanadium					--	0.01	U				0.01	U			
Zinc					5	0.0050	U				0.005	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)															
1,1,1-Trichloroethane					200	1	U				1	U			
1,1,2,2-Tetrachloroethane					--	1	U				1	U			
1,1,2-Trichloroethane					--	1	U				1	U			
1,1-Dichloroethane					1	1	U				1	U			

Groundwater Analytical Summary - Deep Wells: First Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09D					G-10D				
						1/7/20	D	V	Tr	Ch	1/7/20	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)															
1,1-Dichloroethylene					–	1	U				1	U			
1,2,3-Trichloropropane					–	1	U				1	U			
1,2-Dibromo-3-chloropropane					0.2	5	U				5	U			
1,2-Dibromoethane					0.001	0.01	U				0.01	U			
1,2-Dichlorobenzene					–	1	U				1	U			
1,2-Dichloroethane					0.5	0.5	U				0.5	U			
1,2-Dichloropropane					0.6	0.6	U				0.6	U			
1,4-Dichlorobenzene					4	1	U				1	U			
2-Butanone					–	5	U				5	U			
2-Hexanone					–	5	U				5	U			
4-Methyl-2-Pentanone (MIBK)					–	5	U				5	U			
Acetone					–	5	U				5	U			
Acrylonitrile					0.07	0.01	U				0.01	U			
Benzene					1	1	U				1	U			
Bromodichloromethane					0.3	0.3	U				0.3	U			
Bromoform					5	1	U				1	U			
Bromomethane					–	1	U				1	U			
Carbon Disulfide					–	1	U				1	U			
Carbon Tetrachloride					0.3	0.3	U				0.3	U			
Chlorobenzene					–	0.2	U				0.2	U			
Chlorodibromomethane					0.5	0.5	U				0.5	U			
Chloroethane					–	1	U				1	U			
Chloroform					7	1	U				1	U			
Chloromethane					–	1	U				1	U			
cis-1,2-Dichloroethene					–	0.2	U				0.2	U			
cis-1,3-Dichloropropene					0.2	0.2	U				0.2	U			
Dibromomethane					–	0.01	U				0.01	U			
Ethyl Benzene					–	1	U				1	U			
m,p-Xylene					–	1	U				1	U			
Methyl Iodide					–	1	U				1	U			
Methylene Chloride					5	2	U				2	U			
o-Xylene					–	1	U				1	U			
Styrene					–	1	U				1	U			
Tetrachloroethylene					0.8	0.8	U				0.8	U			
Toluene					–	1	U				1	U			
trans-1,2-Dichloroethene					–	1	U				1	U			
trans-1,3-Dichloropropene					0.2	0.2	U				0.2	U			
trans-1,4-Dichloro-2-butene					–	5	U				5	U			
Trichlorethene (1,1,2-Trichloroethylene)					3	1	U				1	U			
Trichlorofluoromethane					–	1	U				1	U			
Vinyl Acetate					–	5	U				5	U			
Vinyl Chloride					0.02	**0.81**					0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in purple exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards.

X = Methylene chloride was measured in the trip blank, but not in the lab blank - contaminations during transport is suspected.

Groundwater Analytical Summary - Deep Wells: Second Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																												Upgradient Wells									
						G-01D					G-02D					G-06B					G-08D2					G-09D					G-10D					G-13D					G-14D					G-24D				
						5/12/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)																																																
Alkalinity (as CaCO3)	nonpar	64	64	280	--	280					98					280					190					170					570		V			190					250					180				
Ammonia Nitrogen	normal	59	59	0.2403	--	0.162					0.02	U				0.028					0.169					0.177			I	Y	0.339		V			0.058			D	N	0.144			D	N	0.084				
Bicarbonate	nonpar	64	64	280	--	250					98					280					130					150					570		V			160					170					160				
Calcium, Dissolved	nonpar	61	61	6.32	--	1.09					0.49			D	N	0.96			D	N	1.13			I	Y	1.42			D	N	21.1		V	D	N	0.52					0.72			I	N	0.57				
Chemical Oxygen Demand	nonpar	62	11	28	--	10	U				10	U				10	U				15					21					12					15					15					10	U			
Chloride	nonpar	64	63	6.86	250	7.09		E	D	N	5.98			D	N	7.18		V	D	N	2.96			D	N	10.4		V			16.7		V	D	N	25.7		V			2.17					3.88			D	N
Conductivity (umhos/cm)	nonpar	64	64	510	700	650		V		Y	390			D	N	700		E		Y	470					720		V			1500		V			460					470					500				
Magnesium, Dissolved	nonpar	61	41	2.33	--	0.2	U				0.2	U				0.2	U				0.22					0.2	U				1.78			D	N	0.2	U				0.2	U				0.2	U			
Nitrate Nitrogen (mg-N/L)	nonpar	63	14	0.21	10	0.01	U				0.091			P	D	N	0.22		E			0.01	U				0.01	U		D	Y	0.01	U				0.01	U				0.01	U				0.01	U			
Nitrite Nitrogen (mg-N/L)	nonpar	60	28	0.47	1	0.007					0.006					0.002					0.002					0.003					0.002	U				0.002	U				0.003					0.002	U			
pH (std units)	nonpar	63	63	6.02-10.02	6.5-8.5	9.35			I	Y	7.99					7.99					10.05		E			9.22					6.95					9.44					9.84					8.80			I	N
Potassium, Dissolved	nonpar	64	56	1.6	--	0.5	U		I	Y	0.5	U				0.5	U		I	N	0.5	U		I	N	0.5	U				1.35					0.5	U			Y	0.5	U				0.5	U			
Sodium, Dissolved	normal	63	63	127.8505	20	155		V			84.2			D	N	168		E	D	N	104					181		V			357		V			107					112					115				
Sulfate	lognor	63	63	230.291	250	51.2				Y	81.6					74.9			D	N	45.4					121					298		V	D	Y	35.1			D	N	3.0			D	Y	42.7				
Total Dissolved Solids	nonpar	64	64	460	500	420					200			D	N	470		E	D	N	360					420		P			990		V			300					300					310				
Total Organic Carbon	nonpar	64	63	26	--	2.0					0.89					2.8					1.1					3.3					4.4				Y	1.5					1.4					2.1				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)																																																
Antimony	nonpar	64	10	0.0015	0.006	0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U			
Arsenic	lognor	60	47	10.0722	0.00005	0.000176					0.00307					0.0039			I	N	0.000532					0.00295					0.0012					0.000183					0.000722					0.00005	U			
Barium	nonpar	60	16	0.0037	1	0.005	U				0.005	U				0.005	U				0.0066		E			0.005	U	P			0.005	U	P			0.005	U				0.005	U				0.005	U			
Beryllium	nonpar	62	0	0.0005	0.004	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium	nonpar	58	8	0.0001	0.005	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Chromium	nonpar	64	7	0.0136	0.05	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt	nonpar	64	2	0.004	--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Copper	nonpar	62	11	0.055	1	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Iron	lognor	57	31	19.5342	0.3	0.05	U				0.067			I	N	0.05	U			Y	0.686			I	N	0.05	U				0.538			I	Y	0.05	U				0.076			I	N	0.05	U			
Lead	nonpar	64	22	0.0023	0.05	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.000196			D	N	0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Manganese	lognor	57	40	11.7351	0.05	0.005	U				0.005					0.005	U				0.025					0.005					0.356			D	N	0.005	U				0.005	U				0.005	U			
Nickel	nonpar	63	2	0.006	0.1	0.01	U				0.01	U	P			0.01	U	P			0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Selenium	nonpar	64	16	0.0025	0.01	0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver	nonpar	61	5	0.0007	0.05	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium	nonpar	64	5	0.0001	0.002	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Vanadium	nonpar	64	1	0.01	--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U	P			0.01	U				0.01	U				0.01	U			
Zinc	nonpar	63	17	0.012	5	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.015		E			0.015		E			0.01	U				0.01	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)																																																
Antimony					0.006	0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.00085					0.00077					0.0003	U				0.0003	U			
Arsenic					0.00005	0.000413					0.00426					0.00338					0.00153					0.00341					0.00121					0.000273					0.00081					0.0001	U			
Barium					1	0.0174					0.005	U				0.0105					0.0278					0.0093					0.0063					0.0079					0.0149					0.005	U			
Beryllium					0.004	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium					0.005	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Chromium					0.05	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt					--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Copper					1	0.01	U				0.01	U				0.01	U				0.01	U				0.01					0.01	U				0.01	U				0.01	U				0.01	U			
Iron					0.3	1.79					0.163					0.842					6.87					0.609					0.512					0.573					2.44					0.055				
Lead					0.05	0.000471					0.000309					0.000686					0.00151					0.00105					0.0001	U				0.000122					0.000485					0.0001	U			
Manganese					0.05	0.0388					0.005	U				0.0645					0.2					0.0478					0.38					0.0116					0.0479					0.0062				
Nickel					0.1	0.01	U				0.01	U				0.015					0.016					0.01	U				0.01	U				0.01	U				0.091					0.01	U			
Selenium					0.01	0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.00067					0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver					0.05	0.0001	U				0.0001	U				0.0001	U				0.00012					0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium					0.002	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.000116					0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Vanadium					--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Zinc					5	0.007					0.005	U				0.0058					0.0217					0.0051					0.005	U				0.005	U				0.021					0.005	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)																																																
1,1,1-Trichloroethane					200	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2,2-Tetrachloroethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2-Trichloroethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1-Dichloroethane					1	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			

Groundwater Analytical Summary - Deep Wells: Second Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																										Upgradient Wells									
						G-01D					G-02D					G-06B					G-08D2					G-09D					G-10D					G-13D					G-14D					G-24D				
						5/12/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/12/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch	5/13/20	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)																																																
1,1-Dichloroethylene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2,3-Trichloropropane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dibromo-3-chloropropane					0.2	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
1,2-Dibromoethane					0.001	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
1,2-Dichlorobenzene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dichloroethane					0.5	0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U			
1,2-Dichloropropane					0.6	0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U			
1,4-Dichlorobenzene					4	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
2-Butanone					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
2-Hexanone					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
4-Methyl-2-Pentanone (MIBK)					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Acetone					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Acrylonitrile					0.07	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Benzene					1	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Bromodichloromethane					0.3	0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U			
Bromoform					5	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Bromomethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Disulfide					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Tetrachloride					0.3	0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U			
Chlorobenzene					--	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
Chlorodibromomethane					0.5	0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U			
Chloroethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Chloroform					7	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Chloromethane					--	1	U				**4.8**					1	U				1	U				1	U				1	U				1	U				1	U				1	U			
cis-1,2-Dichloroethene					--	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
cis-1,3-Dichloropropene					0.2	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
Dibromomethane					--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Ethyl Benzene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
m,p-Xylene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Methyl Iodide					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Methylene Chloride					5	2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U			
o-Xylene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Styrene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Tetrachloroethylene					0.8	0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U			
Toluene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
trans-1,2-Dichloroethene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
trans-1,3-Dichloropropene					0.2	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
trans-1,4-Dichloro-2-butene					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Trichlorethene (1,1,2-Trichloroethylene)					3	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Trichlorofluoromethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Vinyl Acetate					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Vinyl Chloride					0.02	0.01	U				0.01	U				0.01	U				0.01	U				0.74					0.01	U				0.01	U				0.01	U				0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in purple exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Alkalinity (as caco3)	mg/L	G-01D	05/12/2020		280.0000		280.0000
Ammonia nitrogen	mg-N/L	G-01D	05/12/2020		0.1620		0.2403
Bicarbonate	mg/L	G-01D	05/12/2020		250.0000		280.0000
Chemical oxygen demand	mg/L	G-01D	05/12/2020	ND	10.0000		28.0000
Chloride	mg/L	G-01D	05/12/2020		7.0900	*	6.8600
Conductivity	umhos/cm	G-01D	05/12/2020		650.0000	***	510.0000
Dissolved antimony	mg/L	G-01D	05/12/2020	ND	0.0003		0.0015
Dissolved arsenic	mg/L	G-01D	05/12/2020		0.0002		10.0722
Dissolved barium	mg/L	G-01D	05/12/2020	ND	0.0050		0.0037
Dissolved beryllium	mg/L	G-01D	05/12/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-01D	05/12/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-01D	05/12/2020		1.0900		6.3200
Dissolved chromium	mg/L	G-01D	05/12/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-01D	05/12/2020	ND	0.0100		0.0040
Dissolved copper	mg/L	G-01D	05/12/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-01D	05/12/2020	ND	0.0500		19.5342
Dissolved lead	mg/L	G-01D	05/12/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-01D	05/12/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-01D	05/12/2020	ND	0.0050		11.7351
Dissolved nickel	mg/L	G-01D	05/12/2020	ND	0.0100		0.0060
Dissolved potassium	mg/L	G-01D	05/12/2020	ND	0.5000		1.6000
Dissolved selenium	mg/L	G-01D	05/12/2020	ND	0.0005		0.0025
Dissolved silver	mg/L	G-01D	05/12/2020	ND	0.0001		0.0007
Dissolved sodium	mg/L	G-01D	05/12/2020		155.0000	***	127.8505
Dissolved thallium	mg/L	G-01D	05/12/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-01D	05/12/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-01D	05/12/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-01D	05/12/2020	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-01D	05/12/2020		0.0070		0.4700
pH	std units	G-01D	05/12/2020		9.3500		6.02 - 10.02
Sulfate	mg/L	G-01D	05/12/2020		51.2000		230.2910
Total dissolved solids	mg/L	G-01D	05/12/2020		420.0000		460.0000
Total organic carbon	mg/L	G-01D	05/12/2020		2.0000		26.0000
Alkalinity (as caco3)	mg/L	G-02D	05/13/2020		98.0000		280.0000
Ammonia nitrogen	mg-N/L	G-02D	05/13/2020	ND	0.0200		0.2403
Bicarbonate	mg/L	G-02D	05/13/2020		98.0000		280.0000
Chemical oxygen demand	mg/L	G-02D	05/13/2020	ND	10.0000		28.0000
Chloride	mg/L	G-02D	05/13/2020		5.9800		6.8600
Conductivity	umhos/cm	G-02D	05/13/2020		390.0000		510.0000
Dissolved antimony	mg/L	G-02D	05/13/2020	ND	0.0003		0.0015
Dissolved arsenic	mg/L	G-02D	05/13/2020		0.0031		10.0722
Dissolved barium	mg/L	G-02D	05/13/2020	ND	0.0050		0.0037
Dissolved beryllium	mg/L	G-02D	05/13/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-02D	05/13/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-02D	05/13/2020		0.4900		6.3200
Dissolved chromium	mg/L	G-02D	05/13/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-02D	05/13/2020	ND	0.0100		0.0040
Dissolved copper	mg/L	G-02D	05/13/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-02D	05/13/2020		0.0670		19.5342
Dissolved lead	mg/L	G-02D	05/13/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-02D	05/13/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-02D	05/13/2020		0.0050		11.7351
Dissolved nickel	mg/L	G-02D	05/13/2020	ND	0.0100	**	0.0060
Dissolved potassium	mg/L	G-02D	05/13/2020	ND	0.5000		1.6000
Dissolved selenium	mg/L	G-02D	05/13/2020	ND	0.0005		0.0025
Dissolved silver	mg/L	G-02D	05/13/2020	ND	0.0001		0.0007
Dissolved sodium	mg/L	G-02D	05/13/2020		84.2000		127.8505
Dissolved thallium	mg/L	G-02D	05/13/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-02D	05/13/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-02D	05/13/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-02D	05/13/2020		0.0910	**	0.2100
Nitrite nitrogen	mg-N/L	G-02D	05/13/2020		0.0060		0.4700
pH	std units	G-02D	05/13/2020		7.9900		6.02 - 10.02
Sulfate	mg/L	G-02D	05/13/2020		81.6000		230.2910
Total dissolved solids	mg/L	G-02D	05/13/2020		200.0000		460.0000
Total organic carbon	mg/L	G-02D	05/13/2020		0.8900		26.0000
Alkalinity (as caco3)	mg/L	G-06B	05/12/2020		280.0000		280.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Ammonia nitrogen	mg-N/L	G-06B	05/12/2020		0.0280		0.2403
Bicarbonate	mg/L	G-06B	05/12/2020		280.0000		280.0000
Chemical oxygen demand	mg/L	G-06B	05/12/2020	ND	10.0000		28.0000
Chloride	mg/L	G-06B	05/12/2020		7.1800	***	6.8600
Conductivity	umhos/cm	G-06B	05/12/2020		700.0000	*	510.0000
Dissolved antimony	mg/L	G-06B	05/12/2020	ND	0.0003		0.0015
Dissolved arsenic	mg/L	G-06B	05/12/2020		0.0039		10.0722
Dissolved barium	mg/L	G-06B	05/12/2020	ND	0.0050		0.0037
Dissolved beryllium	mg/L	G-06B	05/12/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-06B	05/12/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-06B	05/12/2020		0.9600		6.3200
Dissolved chromium	mg/L	G-06B	05/12/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-06B	05/12/2020	ND	0.0100		0.0040
Dissolved copper	mg/L	G-06B	05/12/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-06B	05/12/2020	ND	0.0500		19.5342
Dissolved lead	mg/L	G-06B	05/12/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-06B	05/12/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-06B	05/12/2020	ND	0.0050		11.7351
Dissolved nickel	mg/L	G-06B	05/12/2020	ND	0.0100	**	0.0060
Dissolved potassium	mg/L	G-06B	05/12/2020	ND	0.5000		1.6000
Dissolved selenium	mg/L	G-06B	05/12/2020	ND	0.0005		0.0025
Dissolved silver	mg/L	G-06B	05/12/2020	ND	0.0001		0.0007
Dissolved sodium	mg/L	G-06B	05/12/2020		168.0000	*	127.8505
Dissolved thallium	mg/L	G-06B	05/12/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-06B	05/12/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-06B	05/12/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-06B	05/12/2020		0.2200	*	0.2100
Nitrite nitrogen	mg-N/L	G-06B	05/12/2020		0.0020		0.4700
pH	std units	G-06B	05/12/2020		7.9900		6.02 - 10.02
Sulfate	mg/L	G-06B	05/12/2020		74.9000		230.2910
Total dissolved solids	mg/L	G-06B	05/12/2020		470.0000	*	460.0000
Total organic carbon	mg/L	G-06B	05/12/2020		2.8000		26.0000
Alkalinity (as caco3)	mg/L	G-08D2	05/13/2020		190.0000		280.0000
Ammonia nitrogen	mg-N/L	G-08D2	05/13/2020		0.1690		0.2403
Bicarbonate	mg/L	G-08D2	05/13/2020		130.0000		280.0000
Chemical oxygen demand	mg/L	G-08D2	05/13/2020		15.0000		28.0000
Chloride	mg/L	G-08D2	05/13/2020		2.9600		6.8600
Conductivity	umhos/cm	G-08D2	05/13/2020		470.0000		510.0000
Dissolved antimony	mg/L	G-08D2	05/13/2020	ND	0.0003		0.0015
Dissolved arsenic	mg/L	G-08D2	05/13/2020		0.0005		10.0722
Dissolved barium	mg/L	G-08D2	05/13/2020		0.0066	*	0.0037
Dissolved beryllium	mg/L	G-08D2	05/13/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-08D2	05/13/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-08D2	05/13/2020		1.1300		6.3200
Dissolved chromium	mg/L	G-08D2	05/13/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-08D2	05/13/2020	ND	0.0100		0.0040
Dissolved copper	mg/L	G-08D2	05/13/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-08D2	05/13/2020		0.6860		19.5342
Dissolved lead	mg/L	G-08D2	05/13/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-08D2	05/13/2020		0.2200		2.3300
Dissolved manganese	mg/L	G-08D2	05/13/2020		0.0250		11.7351
Dissolved nickel	mg/L	G-08D2	05/13/2020	ND	0.0100		0.0060
Dissolved potassium	mg/L	G-08D2	05/13/2020	ND	0.5000		1.6000
Dissolved selenium	mg/L	G-08D2	05/13/2020	ND	0.0005		0.0025
Dissolved silver	mg/L	G-08D2	05/13/2020	ND	0.0001		0.0007
Dissolved sodium	mg/L	G-08D2	05/13/2020		104.0000		127.8505
Dissolved thallium	mg/L	G-08D2	05/13/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-08D2	05/13/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-08D2	05/13/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-08D2	05/13/2020	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-08D2	05/13/2020		0.0020		0.4700
pH	std units	G-08D2	05/13/2020		10.0500	*	6.02 - 10.02
Sulfate	mg/L	G-08D2	05/13/2020		45.4000		230.2910
Total dissolved solids	mg/L	G-08D2	05/13/2020		360.0000		460.0000
Total organic carbon	mg/L	G-08D2	05/13/2020		1.1000		26.0000
Alkalinity (as caco3)	mg/L	G-09D	05/12/2020		170.0000		280.0000
Ammonia nitrogen	mg-N/L	G-09D	05/12/2020		0.1770		0.2403

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Bicarbonate	mg/L	G-09D	05/12/2020		150.0000		280.0000
Chemical oxygen demand	mg/L	G-09D	05/12/2020		21.0000		28.0000
Chloride	mg/L	G-09D	05/12/2020		10.4000	***	6.8600
Conductivity	umhos/cm	G-09D	05/12/2020		720.0000	***	510.0000
Dissolved antimony	mg/L	G-09D	05/12/2020	ND	0.0003		0.0015
Dissolved arsenic	mg/L	G-09D	05/12/2020		0.0030		10.0722
Dissolved barium	mg/L	G-09D	05/12/2020	ND	0.0050	**	0.0037
Dissolved beryllium	mg/L	G-09D	05/12/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-09D	05/12/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-09D	05/12/2020		1.4200		6.3200
Dissolved chromium	mg/L	G-09D	05/12/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-09D	05/12/2020	ND	0.0100		0.0040
Dissolved copper	mg/L	G-09D	05/12/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-09D	05/12/2020	ND	0.0500		19.5342
Dissolved lead	mg/L	G-09D	05/12/2020		0.0002		0.0023
Dissolved magnesium	mg/L	G-09D	05/12/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-09D	05/12/2020		0.0050		11.7351
Dissolved nickel	mg/L	G-09D	05/12/2020	ND	0.0100		0.0060
Dissolved potassium	mg/L	G-09D	05/12/2020	ND	0.5000		1.6000
Dissolved selenium	mg/L	G-09D	05/12/2020	ND	0.0005		0.0025
Dissolved silver	mg/L	G-09D	05/12/2020	ND	0.0001		0.0007
Dissolved sodium	mg/L	G-09D	05/12/2020		181.0000	***	127.8505
Dissolved thallium	mg/L	G-09D	05/12/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-09D	05/12/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-09D	05/12/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-09D	05/12/2020	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-09D	05/12/2020		0.0030		0.4700
pH	std units	G-09D	05/12/2020		9.2200		6.02 - 10.02
Sulfate	mg/L	G-09D	05/12/2020		121.0000		230.2910
Total dissolved solids	mg/L	G-09D	05/12/2020		420.0000	**	460.0000
Total organic carbon	mg/L	G-09D	05/12/2020		3.3000		26.0000
Alkalinity (as caco3)	mg/L	G-10D	05/12/2020		570.0000	***	280.0000
Ammonia nitrogen	mg-N/L	G-10D	05/12/2020		0.3390	***	0.2403
Bicarbonate	mg/L	G-10D	05/12/2020		570.0000	***	280.0000
Chemical oxygen demand	mg/L	G-10D	05/12/2020		12.0000		28.0000
Chloride	mg/L	G-10D	05/12/2020		16.7000	***	6.8600
Conductivity	umhos/cm	G-10D	05/12/2020		1500.0000	***	510.0000
Dissolved antimony	mg/L	G-10D	05/12/2020	ND	0.0003		0.0015
Dissolved arsenic	mg/L	G-10D	05/12/2020		0.0012		10.0722
Dissolved barium	mg/L	G-10D	05/12/2020	ND	0.0050	**	0.0037
Dissolved beryllium	mg/L	G-10D	05/12/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-10D	05/12/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-10D	05/12/2020		21.1000	***	6.3200
Dissolved chromium	mg/L	G-10D	05/12/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-10D	05/12/2020	ND	0.0100		0.0040
Dissolved copper	mg/L	G-10D	05/12/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-10D	05/12/2020		0.5380		19.5342
Dissolved lead	mg/L	G-10D	05/12/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-10D	05/12/2020		1.7800		2.3300
Dissolved manganese	mg/L	G-10D	05/12/2020		0.3560		11.7351
Dissolved nickel	mg/L	G-10D	05/12/2020	ND	0.0100		0.0060
Dissolved potassium	mg/L	G-10D	05/12/2020		1.3500		1.6000
Dissolved selenium	mg/L	G-10D	05/12/2020	ND	0.0005		0.0025
Dissolved silver	mg/L	G-10D	05/12/2020	ND	0.0001		0.0007
Dissolved sodium	mg/L	G-10D	05/12/2020		357.0000	***	127.8505
Dissolved thallium	mg/L	G-10D	05/12/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-10D	05/12/2020	ND	0.0100	**	0.0100
Dissolved zinc	mg/L	G-10D	05/12/2020		0.0150	*	0.0120
Nitrate nitrogen	mg-N/L	G-10D	05/12/2020	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-10D	05/12/2020	ND	0.0020		0.4700
pH	std units	G-10D	05/12/2020		6.9500		6.02 - 10.02
Sulfate	mg/L	G-10D	05/12/2020		298.0000	***	230.2910
Total dissolved solids	mg/L	G-10D	05/12/2020		990.0000	***	460.0000
Total organic carbon	mg/L	G-10D	05/12/2020		4.4000		26.0000
Alkalinity (as caco3)	mg/L	G-13D	05/12/2020		190.0000		280.0000
Ammonia nitrogen	mg-N/L	G-13D	05/12/2020		0.0580		0.2403
Bicarbonate	mg/L	G-13D	05/12/2020		160.0000		280.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Chemical oxygen demand	mg/L	G-13D	05/12/2020		15.0000		28.0000
Chloride	mg/L	G-13D	05/12/2020		25.7000	***	6.8600
Conductivity	umhos/cm	G-13D	05/12/2020		460.0000		510.0000
Dissolved antimony	mg/L	G-13D	05/12/2020	ND	0.0003		0.0015
Dissolved arsenic	mg/L	G-13D	05/12/2020		0.0002		10.0722
Dissolved barium	mg/L	G-13D	05/12/2020	ND	0.0050		0.0037
Dissolved beryllium	mg/L	G-13D	05/12/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-13D	05/12/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-13D	05/12/2020		0.5200		6.3200
Dissolved chromium	mg/L	G-13D	05/12/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-13D	05/12/2020	ND	0.0100		0.0040
Dissolved copper	mg/L	G-13D	05/12/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-13D	05/12/2020	ND	0.0500		19.5342
Dissolved lead	mg/L	G-13D	05/12/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-13D	05/12/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-13D	05/12/2020	ND	0.0050		11.7351
Dissolved nickel	mg/L	G-13D	05/12/2020	ND	0.0100		0.0060
Dissolved potassium	mg/L	G-13D	05/12/2020	ND	0.5000		1.6000
Dissolved selenium	mg/L	G-13D	05/12/2020	ND	0.0005		0.0025
Dissolved silver	mg/L	G-13D	05/12/2020	ND	0.0001		0.0007
Dissolved sodium	mg/L	G-13D	05/12/2020		107.0000		127.8505
Dissolved thallium	mg/L	G-13D	05/12/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-13D	05/12/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-13D	05/12/2020		0.0150	*	0.0120
Nitrate nitrogen	mg-N/L	G-13D	05/12/2020	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-13D	05/12/2020	ND	0.0020		0.4700
pH	std units	G-13D	05/12/2020		9.4400		6.02 - 10.02
Sulfate	mg/L	G-13D	05/12/2020		35.1000		230.2910
Total dissolved solids	mg/L	G-13D	05/12/2020		300.0000		460.0000
Total organic carbon	mg/L	G-13D	05/12/2020		1.5000		26.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, Result = detection limit.

Table 5

Summary Statistics and Prediction Limits

Constituent	Units	Detect	N	Mean	SD	alpha	Factor	Pred Limit	Type		Conf
Alkalinity (as caco3)	mg/L	64	64					280.0000	nonpar		0.99
Ammonia nitrogen	mg-N/L	59	59	0.1194	0.0501	0.0100	2.4125	0.2403	normal		
Bicarbonate	mg/L	64	64					280.0000	nonpar		0.99
Chemical oxygen demand	mg/L	11	62					28.0000	nonpar		0.99
Chloride	mg/L	63	64					6.8600	nonpar		0.99
Conductivity	umhos/cm	64	64					510.0000	nonpar		0.99
Dissolved antimony	mg/L	10	64					0.0015	nonpar		0.99
Dissolved arsenic	mg/L	47	60	-6.4761	3.6440	0.0100	2.4110	10.0722	lognor		
Dissolved barium	mg/L	16	60					0.0037	nonpar		0.99
Dissolved beryllium	mg/L	0	62					0.0005	nonpar	***	0.99
Dissolved cadmium	mg/L	8	58					0.0001	nonpar		0.99
Dissolved calcium	mg/L	61	61					6.3200	nonpar		0.99
Dissolved chromium	mg/L	7	64					0.0136	nonpar		0.99
Dissolved cobalt	mg/L	2	64					0.0040	nonpar		0.99
Dissolved copper	mg/L	11	62					0.0550	nonpar		0.99
Dissolved iron	mg/L	31	57	-1.7586	1.9584	0.0100	2.4157	19.5342	lognor		
Dissolved lead	mg/L	22	64					0.0023	nonpar		0.99
Dissolved magnesium	mg/L	41	61					2.3300	nonpar		0.99
Dissolved manganese	mg/L	40	57	-3.9119	2.6388	0.0100	2.4157	11.7351	lognor		
Dissolved nickel	mg/L	2	63					0.0060	nonpar		0.99
Dissolved potassium	mg/L	56	64					1.6000	nonpar		0.99
Dissolved selenium	mg/L	16	64					0.0025	nonpar		0.99
Dissolved silver	mg/L	5	61					0.0007	nonpar		0.99
Dissolved sodium	mg/L	63	63	108.7937	7.9177	0.0100	2.4069	127.8505	normal		
Dissolved thallium	mg/L	5	64					0.0001	nonpar		0.99
Dissolved vanadium	mg/L	1	64					0.0100	nonpar	***	0.99
Dissolved zinc	mg/L	17	63					0.0120	nonpar		0.99
Nitrate nitrogen	mg-N/L	14	63					0.2100	nonpar		0.99
Nitrite nitrogen	mg-N/L	28	60					0.4700	nonpar		0.99
pH	std units	63	63					6.02- 10.02	nonpar		0.99
Sulfate	mg/L	63	63	2.8910	1.0588	0.0100	2.4069	230.2910	lognor		
Total dissolved solids	mg/L	64	64					460.0000	nonpar		0.99
Total organic carbon	mg/L	63	64					26.0000	nonpar		0.99

Conf = confidence level for passing initial test or one of two verification resamples at all downgradient wells for a single constituent (nonparametric test only).
* - Insufficient Data.
** - Calculated limit raised to Manual Reporting Limit.
*** - Nonparametric limit based on ND value.
For transformed data, mean and SD in transformed units and prediction limit in original units.
All sample sizes and statistics are based on outlier free data.
For nonparametric limits, median reporting limits are substituted for extreme reporting limit values.

Groundwater Analytical Summary - Deep Wells: Third Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09D					G-10D				
						8/5/20	D	V	Tr	Ch	8/5/20	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)															
Alkalinity (as CaCO3)	nonpar	66	66	280	--	190					530		V		
Ammonia Nitrogen	nonpar	59	59	0.2403	--	0.13			I	Y	0.312		V		
Bicarbonate	nonpar	66	66	280	--	170					530		V		
Calcium, Dissolved	nonpar	63	63	6.32	--	1.54			D	Y	21.8		V	D	N
Chemical Oxygen Demand	nonpar	66	16	28	--	24					21				
Chloride	lognor	66	65	6.86	250	9.83		V			15.5		V	D	N
Conductivity (umhos/cm)	nonpar	66	66	510	700	700		V			1600		V		
Magnesium, Dissolved	nonpar	62	40	2.33	--	0.2	U				1.87			D	N
Nitrate Nitrogen (mg-N/L)	nonpar	65	14	0.21	10	0.046			D	N	0.01	U			
Nitrite Nitrogen (mg-N/L)	nonpar	59	29	0.47	1	0.006					0.002	U			
pH (std units)	nonpar	65	65	6.02-10.02	6.5-8.5	9.47					7.27				
Potassium, Dissolved	nonpar	66	62	1.6	--	0.87					2.08		E		
Sodium, Dissolved	nonpar	63	63	127.8505	20	177		V			308		V		
Sulfate	nonpar	65	65	230.291	250	124					274		V	D	Y
Total Dissolved Solids	nonpar	66	66	460	500	440					1000		V		
Total Organic Carbon	nonpar	66	62	26	--	3.7					7.1				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony	nonpar	66	11	0.0015	0.006	0.0003	U				0.0003	U			
Arsenic	lognor	62	45	10.0722	0.00005	0.00363					0.0052				
Barium	nonpar	63	13	0.0037	1	0.005	U				0.005	U			
Beryllium	nonpar	66	0	0.0005	0.004	0.005	U				0.005	U			
Cadmium	nonpar	58	9	0.0001	0.005	0.00005	U				0.00005	U			
Chromium	nonpar	66	8	0.0136	0.05	0.01	U				0.01	U			
Cobalt	nonpar	66	4	0.004	--	0.01	U				0.01	U			
Copper	nonpar	63	10	0.055	1	0.01	U				0.01	U			
Iron	lognor	60	30	19.5342	0.3	0.05	U			Y	0.543			I	N
Lead	nonpar	66	20	0.0023	0.05	0.000134			D	N	0.0001	U			
Manganese	lognor	57	43	11.7351	0.05	0.01					0.376			D	N
Nickel	nonpar	65	2	0.006	0.1	0.091		E			0.189		E		
Selenium	nonpar	65	16	0.0025	0.01	0.0005	U				0.0005	U			
Silver	nonpar	62	6	0.0007	0.05	0.0001	U				0.0001	U			
Thallium	nonpar	65	7	0.0001	0.002	0.00005	U				0.00005	U			
Vanadium	nonpar	66	0	0.01	--	0.01	U				0.01	U			
Zinc	nonpar	65	17	0.012	5	0.01	U				0.01	U	P		
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony					0.006	0.0003	U				0.0003	U			
Arsenic					0.00005	0.00284					0.00112				
Barium					1	0.005	U				0.005	U			
Beryllium					0.004	0.005	U				0.005	U			
Cadmium					0.005	0.000152					0.00005	U			
Chromium					0.05	0.01	U				0.01	U			
Cobalt					--	0.01	U				0.01	U			
Copper					1	0.01	U				0.01	U			
Iron					0.3	0.696					0.582				
Lead					0.05	0.000878					0.0001	U			
Manganese					0.05	0.0479					0.394				
Nickel					0.1	0.03					0.036				
Selenium					0.01	0.0005	U				0.0005	U			
Silver					0.05	0.0001	U				0.0001	U			
Thallium					0.002	0.00017					0.0001	U			
Vanadium					--	0.01	U				0.01	U			
Zinc					5	0.005	U				0.005	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)															
1,1,1-Trichloroethane					200	1	U				1	U			
1,1,2,2-Tetrachloroethane					--	1	U				1	U			
1,1,2-Trichloroethane					--	1	U				1	U			
1,1-Dichloroethane					1	1	U				1	U			

Groundwater Analytical Summary - Deep Wells: Third Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09D					G-10D				
						8/5/20	D	V	Tr	Ch	8/5/20	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)															
1,1-Dichloroethylene					–	1	U				1	U			
1,2,3-Trichloropropane					–	1	U				1	U			
1,2-Dibromo-3-chloropropane					0.2	5	U				5	U			
1,2-Dibromoethane					0.001	0.01	U				0.01	U			
1,2-Dichlorobenzene					–	1	U				1	U			
1,2-Dichloroethane					0.5	0.5	U				0.5	U			
1,2-Dichloropropane					0.6	0.6	U				0.6	U			
1,4-Dichlorobenzene					4	1	U				1	U			
2-Butanone					–	5	U				5	U			
2-Hexanone					–	5	U				5	U			
4-Methyl-2-Pentanone (MIBK)					–	5	U				5	U			
Acetone					–	5	U				5	U			
Acrylonitrile					0.07	0.01	U				0.01	U			
Benzene					1	1	U				1	U			
Bromodichloromethane					0.3	0.3	U				0.3	U			
Bromoform					5	1	U				1	U			
Bromomethane					–	1	U				1	U			
Carbon Disulfide					–	1	U				1	U			
Carbon Tetrachloride					0.3	0.3	U				0.3	U			
Chlorobenzene					–	0.2	U				0.2	U			
Chlorodibromomethane					0.5	0.5	U				0.5	U			
Chloroethane					–	1	U				1	U			
Chloroform					7	1	U				1	U			
Chloromethane					–	1	U				1	U			
cis-1,2-Dichloroethene					–	0.2	U				0.2	U			
cis-1,3-Dichloropropene					0.2	0.2	U				0.2	U			
Dibromomethane					–	0.01	U				0.01	U			
Ethyl Benzene					–	1	U				1	U			
m,p-Xylene					–	1	U				1	U			
Methyl Iodide					–	1	U				1	U			
Methylene Chloride					5	5.3	B				5.1	B			
o-Xylene					–	1	U				1	U			
Styrene					–	1	U				1	U			
Tetrachloroethylene					0.8	0.8	U				0.8	U			
Toluene					–	1	U				1	U			
trans-1,2-Dichloroethene					–	1	U				1	U			
trans-1,3-Dichloropropene					0.2	0.2	U				0.2	U			
trans-1,4-Dichloro-2-butene					–	5	U				5	U			
Trichlorethene (1,1,2-Trichloroethylene)					3	1	U				1	U			
Trichlorofluoromethane					–	1	U				1	U			
Vinyl Acetate					–	5	U				5	U			
Vinyl Chloride					0.02	0.14					0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in purple exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards.

B = Methylene chloride was measured in the lab blank at a similar concentration - contamination during analysis suspected.

Groundwater Analytical Summary - Deep Wells: Fourth Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																																Upgradient Wells									
						G-01D					G-02D					G-06B					G-08D2					G-09D					G-10D					G-13D					G-14D					G-24D				
						10/15/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/15/20	D	V	Tr	Ch	10/15/20	D	V	Tr	Ch	10/15/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)																																															
Alkalinity (as CaCO3)	nonpar	64	64	280	--	240					90					290		E			190					210					520		V			180					230					210				
Ammonia Nitrogen	normal	59	59	0.2403	--	0.02	U				0.053					0.07					0.247		E			0.167			I	N	0.339		V			0.074			D	N	0.224				Y	0.253				
Bicarbonate	nonpar	64	64	280	--	120			D	Y	90					230					72					130					520		V			100					120					180				
Calcium, Dissolved	nonpar	61	61	6.32	--	0.73					0.44			D	N	1.02				Y	0.57				Y	1.32				Y	20.8		V	D	N	0.51					0.60				Y	0.71				
Chemical Oxygen Demand	nonpar	62	11	28	--	10	U				10	U				10	U				10	U				10	U				10	U				10	U				10	U				10	U			
Chloride	nonpar	64	63	6.86	250	7.81			D	N	5.37			D	N	7.85		E	D	N	0.92			D	N	10.6		V			16.3		V	D	N	14.1		V			2.34			D	Y	6.34			D	N
Conductivity (umhos/cm)	nonpar	64	64	510	700	610		V			360			D	N	710		V			490					730		V			1600		V			450					490					530				
Magnesium, Dissolved	nonpar	61	41	2.33	--	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				1.78			D	N	0.2	U				0.2	U				0.2	U			
Nitrate Nitrogen (mg-N/L)	nonpar	63	14	0.21	10	0.01	U				0.42		E	D	N	0.24		E			0.01	U				0.11			D	Y	0.01	U				0.01	U				0.05					0.01	U			
Nitrite Nitrogen (mg-N/L)	nonpar	60	28	0.47	1	0.002	U				0.003					0.002	U				0.002	U				0.002					0.002	U				0.002	U				0.004					0.002	U			
pH (std units)	nonpar	63	63	6.02-10.02	6.5-8.5	10.04		E	I	N	7.61					8.84					9.85		P			9.88					7.69					10.13		E	I	Y	9.88					8.80			I	N
Potassium, Dissolved	nonpar	64	56	1.6	--	0.5	U			Y	0.5	U			Y	0.5				Y	0.5	U			Y	0.54					1.70		E			0.5	U				0.5	U				0.5	U			
Sodium, Dissolved	normal	63	63	127.8505	20	145		V			83.5			D	N	176		V		Y	111					164		V			325		V			107					120					138				
Sulfate	lognor	63	63	230.291	250	49.8			D	Y	69.1					74.6			D	N	45.5					136					283		V		Y	32.6			D	N	3.0			D	N	35.0				
Total Dissolved Solids	nonpar	64	64	460	500	380			D	Y	240			D	N	460		P	D	N	320					460					1100		V			300					310					350				
Total Organic Carbon	nonpar	64	63	26	--	1.9					1.2					3.6					1.2					3.5					5.5					1.3					3.0					3.6				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)																																															
Antimony	nonpar	64	10	0.0015	0.006	0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U			
Arsenic	lognor	60	47	10.0722	0.00005	0.000382					0.00424					0.00421			I	N	0.000616			I	Y	0.00231			D	Y	0.0008		P			0.000102					0.000691					0.000053				
Barium	nonpar	60	16	0.0037	1	0.005	U				0.005	U				0.005	U				0.005	U	P			0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Beryllium	nonpar	62	0	0.0005	0.004	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium	nonpar	58	8	0.0001	0.005	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.000053					0.00005	U				0.00005	U				0.00005	U			
Chromium	nonpar	64	7	0.0136	0.05	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt	nonpar	64	2	0.004	--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Copper	nonpar	62	11	0.055	1	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Iron	lognor	57	31	19.5342	0.3	0.05	U				0.105			I	N	0.05	U			Y	0.05	U			Y	0.05	U		I	Y	0.471				Y	0.05	U				0.05	U			Y	0.05	U			
Lead	nonpar	64	22	0.0023	0.05	0.000111					0.0001	U				0.00011					0.0001	U				0.0001	U		D	N	0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Manganese	lognor	57	40	11.7351	0.05	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.362			D	N	0.005	U		I	Y	0.005	U				0.005	U			
Nickel	nonpar	63	2	0.006	0.1	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U	P			0.01	U	P			0.01	U				0.01	U				0.01	U			
Selenium	nonpar	64	16	0.0025	0.01	0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver	nonpar	61	5	0.0007	0.05	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium	nonpar	64	5	0.0001	0.002	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Vanadium	nonpar	64	1	0.01	--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Zinc	nonpar	63	17	0.012	5	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U	P			0.01	U				0.01	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)																																															
Antimony					0.006	0.0003	U				0.00043					0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U			
Arsenic					0.00005	0.000443					0.00479					0.00391					0.000878					0.00305					0.00117					0.000171					0.000654					0.0001	U			
Barium					1	0.0119					0.005	U				0.005	U				0.0185					0.005	U				0.005	U				0.005	U				0.0126					0.005	U			
Beryllium					0.004	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium					0.005	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Chromium					0.05	0.01	U				0.01	U				0.0218					0.01	U				0.014					0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt					--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Copper					1	0.01	U				0.01	U				0.01	U				0.01	U				0.012					0.01	U				0.01	U				0.01	U				0.01	U			
Iron					0.3	2.76					0.501					0.948					6.05					0.622					0.482					0.339					3.89					0.05	U			
Lead					0.05	0.000236					0.000232					0.000315					0.000573					0.000883					0.0001	U				0.0001	U				0.00033					0.0001	U			
Manganese					0.05	0.0468					0.005	U				0.0452					0.134					0.0663					0.345					0.0089					0.0573					0.005	U			
Nickel					0.1	0.01	U				0.01	U				0.021					0.01	U				0.01					0.01	U				0.013					0.01	U				0.014				
Selenium					0.01	0.0005	U				0.00062					0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver					0.05	0.0001	U				0.00147					0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium					0.002	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Vanadium					--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Zinc					5	0.0074					0.005	U				0.005	U				0.005	U				0.0069					0.005	U				0.005	U				0.005	U				0.005	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)																																															
1,1,1-Trichloroethane					200	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2,2-Tetrachloroethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2-Trichloroethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1-Dichloroethane					1	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			

Groundwater Analytical Summary - Deep Wells: Fourth Quarter 2020
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																										Upgradient Wells									
						G-01D					G-02D					G-06B					G-08D2					G-09D					G-10D					G-13D					G-14D					G-24D				
						10/15/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/15/20	D	V	Tr	Ch	10/15/20	D	V	Tr	Ch	10/15/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch	10/14/20	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)																																																
1,1-Dichloroethylene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2,3-Trichloropropane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dibromo-3-chloropropane					0.2	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
1,2-Dibromoethane					0.001	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
1,2-Dichlorobenzene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dichloroethane					0.5	0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U			
1,2-Dichloropropane					0.6	0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U				0.6	U			
1,4-Dichlorobenzene					4	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
2-Butanone					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
2-Hexanone					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
4-Methyl-2-Pentanone (MIBK)					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Acetone					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Acrylonitrile					0.07	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Benzene					1	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Bromodichloromethane					0.3	0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U			
Bromoform					5	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Bromomethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Disulfide					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Tetrachloride					0.3	0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U				0.3	U			
Chlorobenzene					--	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
Chlorodibromomethane					0.5	0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U			
Chloroethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Chloroform					7	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Chloromethane					--	1	U				2.2					1	U				1	U				1	U				1	U				1	U				1	U				1	U			
cis-1,2-Dichloroethene					--	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
cis-1,3-Dichloropropene					0.2	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
Dibromomethane					--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Ethyl Benzene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
m,p-Xylene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Methyl Iodide					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Methylene Chloride					5	2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U			
o-Xylene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Styrene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Tetrachloroethylene					0.8	0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U				0.8	U			
Toluene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
trans-1,2-Dichloroethene					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
trans-1,3-Dichloropropene					0.2	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U			
trans-1,4-Dichloro-2-butene					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Trichloroethene (1,1,2-Trichloroethylene)					3	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Trichlorofluoromethane					--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Vinyl Acetate					--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Vinyl Chloride					0.02	0.01	U				0.01	U				0.01	U				0.01	U				0.23					0.01	U				0.01	U				0.01	U				0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in purple exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Alkalinity (as caco3)	mg/L	G-01D	10/15/2020		240.0000		280.0000
Ammonia nitrogen	mg-N/L	G-01D	10/15/2020	ND	0.0200		0.2931
Bicarbonate	mg/L	G-01D	10/15/2020		120.0000		280.0000
Chemical oxygen demand	mg/L	G-01D	10/15/2020	ND	10.0000		28.0000
Chloride	mg/L	G-01D	10/15/2020		7.8100		8.8360
Conductivity	umhos/cm	G-01D	10/15/2020		610.0000	***	530.0000
Dissolved antimony	mg/L	G-01D	10/15/2020	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-01D	10/15/2020		0.0004		0.0021
Dissolved barium	mg/L	G-01D	10/15/2020	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-01D	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-01D	10/15/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-01D	10/15/2020		0.7300		6.3200
Dissolved chromium	mg/L	G-01D	10/15/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-01D	10/15/2020	ND	0.0100		0.0050
Dissolved copper	mg/L	G-01D	10/15/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-01D	10/15/2020	ND	0.0500		19.4192
Dissolved lead	mg/L	G-01D	10/15/2020		0.0001		0.0023
Dissolved magnesium	mg/L	G-01D	10/15/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-01D	10/15/2020	ND	0.0050		10.2259
Dissolved nickel	mg/L	G-01D	10/15/2020	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-01D	10/15/2020	ND	0.5000		1.7013
Dissolved selenium	mg/L	G-01D	10/15/2020	ND	0.0005		0.0014
Dissolved silver	mg/L	G-01D	10/15/2020	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-01D	10/15/2020		145.0000	***	131.0645
Dissolved thallium	mg/L	G-01D	10/15/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-01D	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-01D	10/15/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-01D	10/15/2020	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-01D	10/15/2020	ND	0.0020		0.0540
pH	std units	G-01D	10/15/2020		10.0400	*	6.02 - 9.88
Sulfate	mg/L	G-01D	10/15/2020		49.8000		66.0500
Total dissolved solids	mg/L	G-01D	10/15/2020		380.0000		460.0000
Total organic carbon	mg/L	G-01D	10/15/2020		1.9000		26.0000
Alkalinity (as caco3)	mg/L	G-02D	10/14/2020		90.0000		280.0000
Ammonia nitrogen	mg-N/L	G-02D	10/14/2020		0.0530		0.2931
Bicarbonate	mg/L	G-02D	10/14/2020		90.0000		280.0000
Chemical oxygen demand	mg/L	G-02D	10/14/2020	ND	10.0000		28.0000
Chloride	mg/L	G-02D	10/14/2020		5.3700		8.8360
Conductivity	umhos/cm	G-02D	10/14/2020		360.0000		530.0000
Dissolved antimony	mg/L	G-02D	10/14/2020	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-02D	10/14/2020		0.0042	***	0.0021
Dissolved barium	mg/L	G-02D	10/14/2020	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-02D	10/14/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-02D	10/14/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-02D	10/14/2020		0.4400		6.3200
Dissolved chromium	mg/L	G-02D	10/14/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-02D	10/14/2020	ND	0.0100		0.0050
Dissolved copper	mg/L	G-02D	10/14/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-02D	10/14/2020		0.1050		19.4192
Dissolved lead	mg/L	G-02D	10/14/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-02D	10/14/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-02D	10/14/2020	ND	0.0050		10.2259
Dissolved nickel	mg/L	G-02D	10/14/2020	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-02D	10/14/2020	ND	0.5000		1.7013
Dissolved selenium	mg/L	G-02D	10/14/2020	ND	0.0005		0.0014
Dissolved silver	mg/L	G-02D	10/14/2020	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-02D	10/14/2020		83.5000		131.0645
Dissolved thallium	mg/L	G-02D	10/14/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-02D	10/14/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-02D	10/14/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-02D	10/14/2020		0.4200	*	0.2100
Nitrite nitrogen	mg-N/L	G-02D	10/14/2020		0.0030		0.0540
pH	std units	G-02D	10/14/2020		7.6100		6.02 - 9.88
Sulfate	mg/L	G-02D	10/14/2020		69.1000	***	66.0500
Total dissolved solids	mg/L	G-02D	10/14/2020		240.0000		460.0000
Total organic carbon	mg/L	G-02D	10/14/2020		1.2000		26.0000
Alkalinity (as caco3)	mg/L	G-06B	10/14/2020		290.0000	*	280.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Ammonia nitrogen	mg-N/L	G-06B	10/14/2020		0.0700		0.2931
Bicarbonate	mg/L	G-06B	10/14/2020		230.0000		280.0000
Chemical oxygen demand	mg/L	G-06B	10/14/2020	ND	10.0000		28.0000
Chloride	mg/L	G-06B	10/14/2020		7.8500		8.8360
Conductivity	umhos/cm	G-06B	10/14/2020		710.0000	***	530.0000
Dissolved antimony	mg/L	G-06B	10/14/2020	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-06B	10/14/2020		0.0042	***	0.0021
Dissolved barium	mg/L	G-06B	10/14/2020	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-06B	10/14/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-06B	10/14/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-06B	10/14/2020		1.0200		6.3200
Dissolved chromium	mg/L	G-06B	10/14/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-06B	10/14/2020	ND	0.0100		0.0050
Dissolved copper	mg/L	G-06B	10/14/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-06B	10/14/2020	ND	0.0500		19.4192
Dissolved lead	mg/L	G-06B	10/14/2020		0.0001		0.0023
Dissolved magnesium	mg/L	G-06B	10/14/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-06B	10/14/2020	ND	0.0050		10.2259
Dissolved nickel	mg/L	G-06B	10/14/2020	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-06B	10/14/2020		0.5000		1.7013
Dissolved selenium	mg/L	G-06B	10/14/2020	ND	0.0005		0.0014
Dissolved silver	mg/L	G-06B	10/14/2020	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-06B	10/14/2020		176.0000	***	131.0645
Dissolved thallium	mg/L	G-06B	10/14/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-06B	10/14/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-06B	10/14/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-06B	10/14/2020		0.2400	*	0.2100
Nitrite nitrogen	mg-N/L	G-06B	10/14/2020	ND	0.0020		0.0540
pH	std units	G-06B	10/14/2020		8.8400		6.02 - 9.88
Sulfate	mg/L	G-06B	10/14/2020		74.6000	***	66.0500
Total dissolved solids	mg/L	G-06B	10/14/2020		460.0000	**	460.0000
Total organic carbon	mg/L	G-06B	10/14/2020		3.6000		26.0000
Alkalinity (as caco3)	mg/L	G-08D2	10/14/2020		190.0000		280.0000
Ammonia nitrogen	mg-N/L	G-08D2	10/14/2020		0.2470		0.2931
Bicarbonate	mg/L	G-08D2	10/14/2020		72.0000		280.0000
Chemical oxygen demand	mg/L	G-08D2	10/14/2020	ND	10.0000		28.0000
Chloride	mg/L	G-08D2	10/14/2020		0.9200		8.8360
Conductivity	umhos/cm	G-08D2	10/14/2020		490.0000		530.0000
Dissolved antimony	mg/L	G-08D2	10/14/2020	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-08D2	10/14/2020		0.0006		0.0021
Dissolved barium	mg/L	G-08D2	10/14/2020	ND	0.0050	**	0.0046
Dissolved beryllium	mg/L	G-08D2	10/14/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-08D2	10/14/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-08D2	10/14/2020		0.5700		6.3200
Dissolved chromium	mg/L	G-08D2	10/14/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-08D2	10/14/2020	ND	0.0100		0.0050
Dissolved copper	mg/L	G-08D2	10/14/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-08D2	10/14/2020	ND	0.0500		19.4192
Dissolved lead	mg/L	G-08D2	10/14/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-08D2	10/14/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-08D2	10/14/2020	ND	0.0050		10.2259
Dissolved nickel	mg/L	G-08D2	10/14/2020	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-08D2	10/14/2020	ND	0.5000		1.7013
Dissolved selenium	mg/L	G-08D2	10/14/2020	ND	0.0005		0.0014
Dissolved silver	mg/L	G-08D2	10/14/2020	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-08D2	10/14/2020		111.0000		131.0645
Dissolved thallium	mg/L	G-08D2	10/14/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-08D2	10/14/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-08D2	10/14/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-08D2	10/14/2020	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-08D2	10/14/2020	ND	0.0020		0.0540
pH	std units	G-08D2	10/14/2020		9.8500	**	6.02 - 9.88
Sulfate	mg/L	G-08D2	10/14/2020		45.5000		66.0500
Total dissolved solids	mg/L	G-08D2	10/14/2020		320.0000		460.0000
Total organic carbon	mg/L	G-08D2	10/14/2020		1.2000		26.0000
Alkalinity (as caco3)	mg/L	G-09D	10/15/2020		210.0000		280.0000
Ammonia nitrogen	mg-N/L	G-09D	10/15/2020		0.1670		0.2931

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Bicarbonate	mg/L	G-09D	10/15/2020		130.0000		280.0000
Chemical oxygen demand	mg/L	G-09D	10/15/2020	ND	10.0000		28.0000
Chloride	mg/L	G-09D	10/15/2020		10.6000	***	8.8360
Conductivity	umhos/cm	G-09D	10/15/2020		730.0000	***	530.0000
Dissolved antimony	mg/L	G-09D	10/15/2020	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-09D	10/15/2020		0.0023	***	0.0021
Dissolved barium	mg/L	G-09D	10/15/2020	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-09D	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-09D	10/15/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-09D	10/15/2020		1.3200		6.3200
Dissolved chromium	mg/L	G-09D	10/15/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-09D	10/15/2020	ND	0.0100		0.0050
Dissolved copper	mg/L	G-09D	10/15/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-09D	10/15/2020	ND	0.0500		19.4192
Dissolved lead	mg/L	G-09D	10/15/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-09D	10/15/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-09D	10/15/2020	ND	0.0050		10.2259
Dissolved nickel	mg/L	G-09D	10/15/2020	ND	0.0100	**	0.0260
Dissolved potassium	mg/L	G-09D	10/15/2020		0.5400		1.7013
Dissolved selenium	mg/L	G-09D	10/15/2020	ND	0.0005		0.0014
Dissolved silver	mg/L	G-09D	10/15/2020	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-09D	10/15/2020		164.0000	***	131.0645
Dissolved thallium	mg/L	G-09D	10/15/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-09D	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-09D	10/15/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-09D	10/15/2020		0.1100		0.2100
Nitrite nitrogen	mg-N/L	G-09D	10/15/2020		0.0020		0.0540
pH	std units	G-09D	10/15/2020		9.8800		6.02 - 9.88
Sulfate	mg/L	G-09D	10/15/2020		136.0000	***	66.0500
Total dissolved solids	mg/L	G-09D	10/15/2020		460.0000		460.0000
Total organic carbon	mg/L	G-09D	10/15/2020		3.5000		26.0000
Alkalinity (as caco3)	mg/L	G-10D	10/15/2020		520.0000	***	280.0000
Ammonia nitrogen	mg-N/L	G-10D	10/15/2020		0.3390	***	0.2931
Bicarbonate	mg/L	G-10D	10/15/2020		520.0000	***	280.0000
Chemical oxygen demand	mg/L	G-10D	10/15/2020	ND	10.0000		28.0000
Chloride	mg/L	G-10D	10/15/2020		16.3000	***	8.8360
Conductivity	umhos/cm	G-10D	10/15/2020		1600.0000	***	530.0000
Dissolved antimony	mg/L	G-10D	10/15/2020	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-10D	10/15/2020		0.0008	**	0.0021
Dissolved barium	mg/L	G-10D	10/15/2020	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-10D	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-10D	10/15/2020		0.0001		0.0001
Dissolved calcium	mg/L	G-10D	10/15/2020		20.8000	***	6.3200
Dissolved chromium	mg/L	G-10D	10/15/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-10D	10/15/2020	ND	0.0100		0.0050
Dissolved copper	mg/L	G-10D	10/15/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-10D	10/15/2020		0.4710		19.4192
Dissolved lead	mg/L	G-10D	10/15/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-10D	10/15/2020		1.7800		2.3300
Dissolved manganese	mg/L	G-10D	10/15/2020		0.3620		10.2259
Dissolved nickel	mg/L	G-10D	10/15/2020	ND	0.0100	**	0.0260
Dissolved potassium	mg/L	G-10D	10/15/2020		1.7000	**	1.7013
Dissolved selenium	mg/L	G-10D	10/15/2020	ND	0.0005		0.0014
Dissolved silver	mg/L	G-10D	10/15/2020	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-10D	10/15/2020		325.0000	***	131.0645
Dissolved thallium	mg/L	G-10D	10/15/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-10D	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-10D	10/15/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-10D	10/15/2020	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-10D	10/15/2020	ND	0.0020		0.0540
pH	std units	G-10D	10/15/2020		7.6900		6.02 - 9.88
Sulfate	mg/L	G-10D	10/15/2020		283.0000	***	66.0500
Total dissolved solids	mg/L	G-10D	10/15/2020		1100.0000	***	460.0000
Total organic carbon	mg/L	G-10D	10/15/2020		5.5000		26.0000
Alkalinity (as caco3)	mg/L	G-13D	10/15/2020		180.0000		280.0000
Ammonia nitrogen	mg-N/L	G-13D	10/15/2020		0.0740		0.2931
Bicarbonate	mg/L	G-13D	10/15/2020		100.0000		280.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Chemical oxygen demand	mg/L	G-13D	10/15/2020	ND	10.0000		28.0000
Chloride	mg/L	G-13D	10/15/2020		14.1000	***	8.8360
Conductivity	umhos/cm	G-13D	10/15/2020		450.0000		530.0000
Dissolved antimony	mg/L	G-13D	10/15/2020	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-13D	10/15/2020		0.0001		0.0021
Dissolved barium	mg/L	G-13D	10/15/2020	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-13D	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-13D	10/15/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-13D	10/15/2020		0.5100		6.3200
Dissolved chromium	mg/L	G-13D	10/15/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-13D	10/15/2020	ND	0.0100		0.0050
Dissolved copper	mg/L	G-13D	10/15/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-13D	10/15/2020	ND	0.0500		19.4192
Dissolved lead	mg/L	G-13D	10/15/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-13D	10/15/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-13D	10/15/2020	ND	0.0050		10.2259
Dissolved nickel	mg/L	G-13D	10/15/2020	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-13D	10/15/2020	ND	0.5000		1.7013
Dissolved selenium	mg/L	G-13D	10/15/2020	ND	0.0005		0.0014
Dissolved silver	mg/L	G-13D	10/15/2020	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-13D	10/15/2020		107.0000		131.0645
Dissolved thallium	mg/L	G-13D	10/15/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-13D	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-13D	10/15/2020	ND	0.0100	**	0.0120
Nitrate nitrogen	mg-N/L	G-13D	10/15/2020	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-13D	10/15/2020	ND	0.0020		0.0540
pH	std units	G-13D	10/15/2020		10.1300	*	6.02 - 9.88
Sulfate	mg/L	G-13D	10/15/2020		32.6000		66.0500
Total dissolved solids	mg/L	G-13D	10/15/2020		300.0000		460.0000
Total organic carbon	mg/L	G-13D	10/15/2020		1.3000		26.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, Result = detection limit.

Table 5

Summary Statistics and Prediction Limits

Constituent	Units	Detect	N	Mean	SD	alpha	Factor	Pred Limit	Type		Conf
Alkalinity (as caco3)	mg/L	58	58					280.0000	nonpar		0.99
Ammonia nitrogen	mg-N/L	55	55	-2.2071	0.4050	0.0100	2.4191	0.2931	lognor		
Bicarbonate	mg/L	58	58					280.0000	nonpar		0.99
Chemical oxygen demand	mg/L	9	57					28.0000	nonpar		0.99
Chloride	mg/L	57	58	1.2681	0.3773	0.0100	2.4141	8.8360	lognor		
Conductivity	umhos/cm	58	58					530.0000	nonpar		0.99
Dissolved antimony	mg/L	9	56					0.0008	nonpar		0.99
Dissolved arsenic	mg/L	47	57					0.0021	nonpar		0.99
Dissolved barium	mg/L	16	58					0.0046	nonpar		0.99
Dissolved beryllium	mg/L	0	54					0.0005	nonpar	***	0.99
Dissolved cadmium	mg/L	8	54					0.0001	nonpar		0.99
Dissolved calcium	mg/L	55	55					6.3200	nonpar		0.99
Dissolved chromium	mg/L	7	58					0.0136	nonpar		0.99
Dissolved cobalt	mg/L	2	58					0.0050	nonpar	***	0.99
Dissolved copper	mg/L	11	58					0.0550	nonpar		0.99
Dissolved iron	mg/L	30	55	-1.7421	1.9464	0.0100	2.4191	19.4192	lognor		
Dissolved lead	mg/L	19	56					0.0023	nonpar		0.99
Dissolved magnesium	mg/L	39	56					2.3300	nonpar		0.99
Dissolved manganese	mg/L	40	56	-3.9817	2.6089	0.0100	2.4173	10.2259	lognor		
Dissolved nickel	mg/L	3	58					0.0260	nonpar		0.99
Dissolved potassium	mg/L	48	58	-1.1431	0.6936	0.0100	2.4141	1.7013	lognor		
Dissolved selenium	mg/L	15	56					0.0014	nonpar		0.99
Dissolved silver	mg/L	2	55					0.0001	nonpar		0.99
Dissolved sodium	mg/L	57	57	109.2719	9.0213	0.0100	2.4157	131.0645	normal		
Dissolved thallium	mg/L	4	58					0.0001	nonpar		0.99
Dissolved vanadium	mg/L	1	58					0.0100	nonpar	***	0.99
Dissolved zinc	mg/L	15	58					0.0120	nonpar		0.99
Nitrate nitrogen	mg-N/L	15	57					0.2100	nonpar		0.99
Nitrite nitrogen	mg-N/L	26	58					0.0540	nonpar		0.99
pH	std units	58	58					6.02- 9.88	nonpar		0.99
Sulfate	mg/L	57	57					66.0500	nonpar		0.99
Total dissolved solids	mg/L	58	58					460.0000	nonpar		0.99
Total organic carbon	mg/L	58	58					26.0000	nonpar		0.99

Conf = confidence level for passing initial test or one of two verification resamples at all downgradient wells for a single constituent (nonparametric test only).
* - Insufficient Data.
** - Calculated limit raised to Manual Reporting Limit.
*** - Nonparametric limit based on ND value.
For transformed data, mean and SD in transformed units and prediction limit in original units.
All sample sizes and statistics are based on outlier free data.
For nonparametric limits, median reporting limits are substituted for extreme reporting limit values.

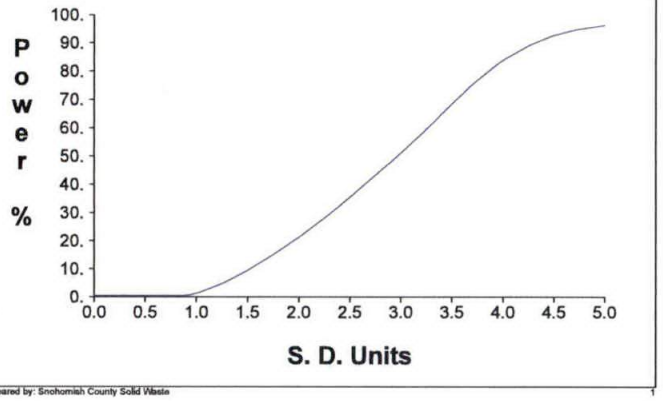
Appendix C

Groundwater Statistical Analyses

Shallow Wells

Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

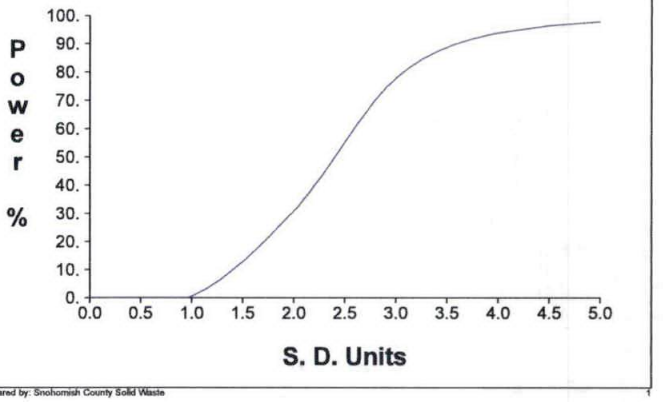
False Positive and False Negative Rates for Current Intra-Well Prediction Limits Monitoring Program



Prepared by: Snohomish County Solid Waste 1

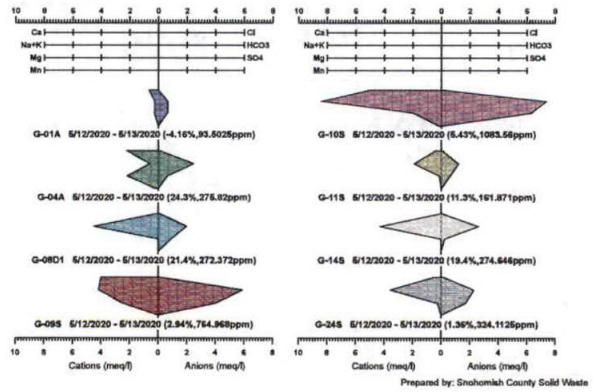
Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

False Positive and False Negative Rates for Current Upgradient vs. Downgradient Monitoring Program



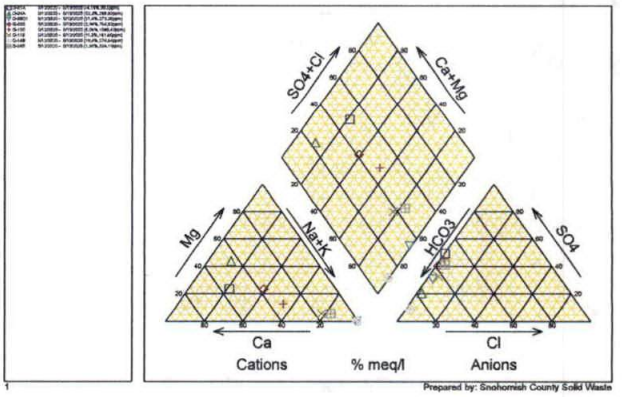
Prepared by: Snohomish County Solid Waste 1

Cathcart Landfill



1 Prepared by: Snohomish County Solid Waste

Cathcart Landfill

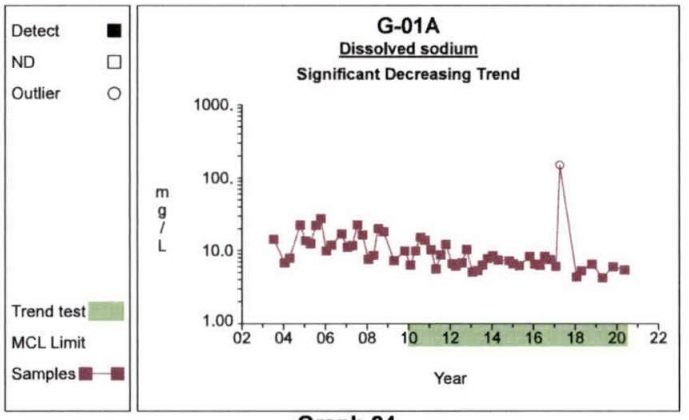


1 Prepared by: Snohomish County Solid Waste

Cathcart Landfill [CCSHAL]

Analysis prepared on: 7/10/2020

Time Series



Graph 24

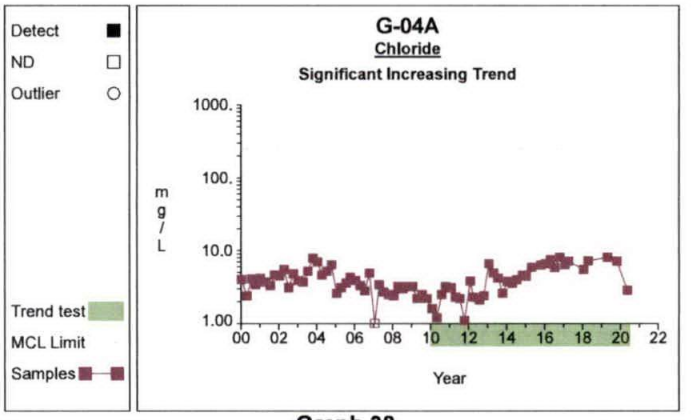
Prepared by: Snohomish County Solid Waste

1

Cathcart Landfill [CCSHAL]

Analysis prepared on: 7/10/2020

Time Series



Graph 38

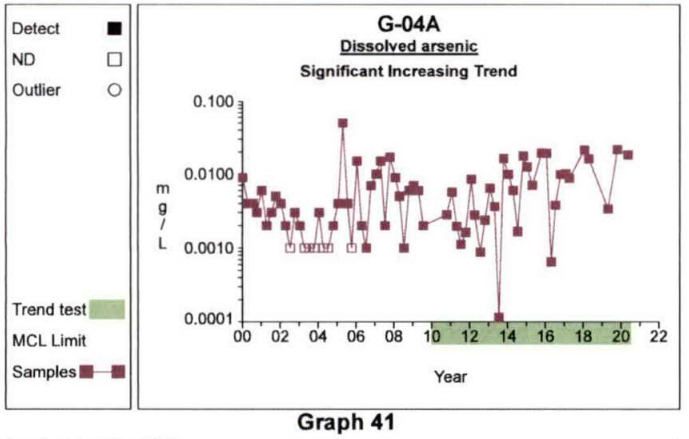
Prepared by: Snohomish County Solid Waste

2

Cathcart Landfill [CCSHAL]

Analysis prepared on: 7/10/2020

Time Series



Graph 41

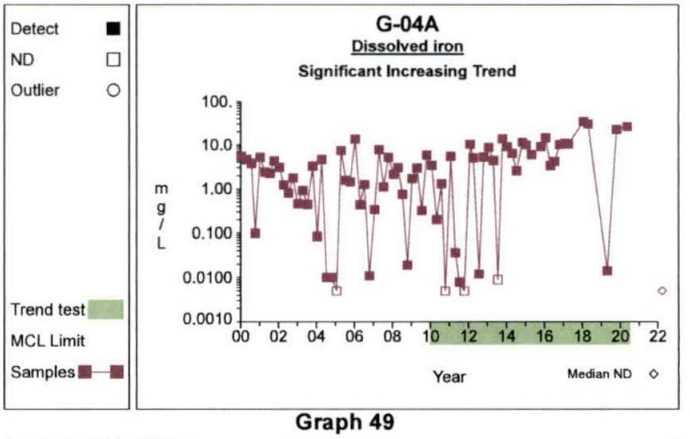
Prepared by: Snohomish County Solid Waste

3

Cathcart Landfill [CCSHAL]

Analysis prepared on: 7/10/2020

Time Series



Graph 49

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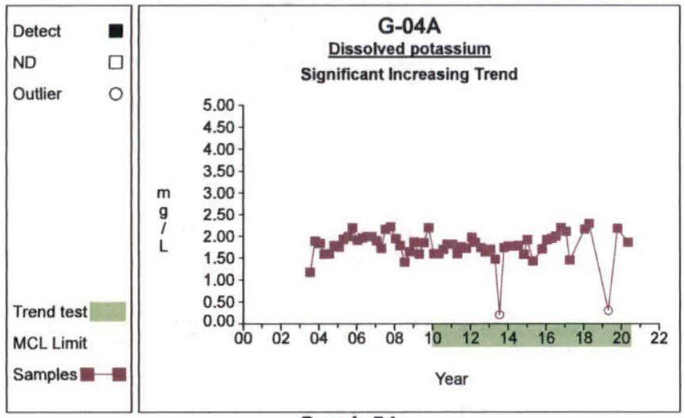
4

Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

Time Series

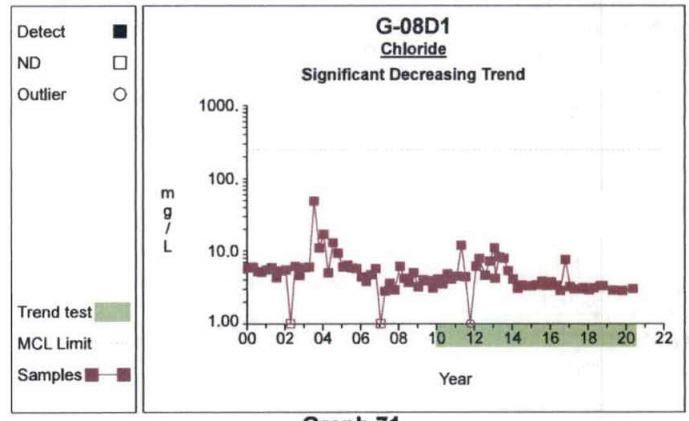


Graph 54

Prepared by: Snohomish County Solid Waste 5

Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

Time Series

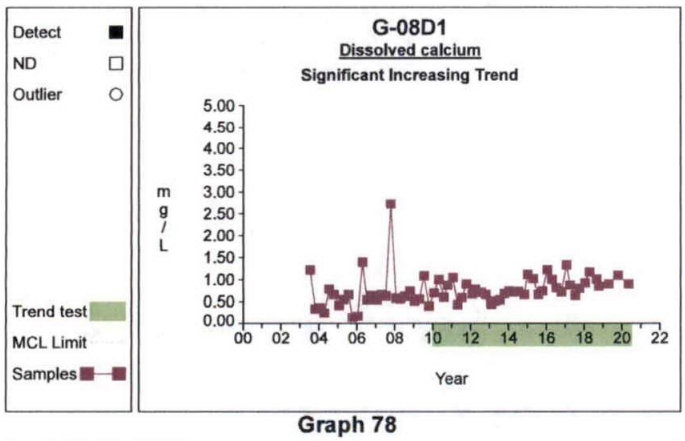


Graph 71

Prepared by: Snohomish County Solid Waste 6

Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

Time Series

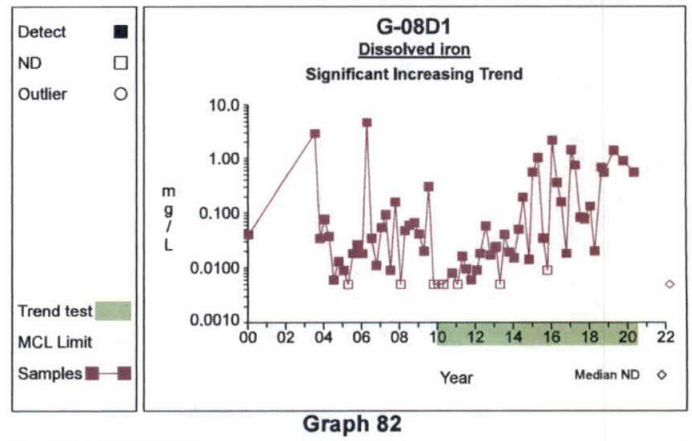


Graph 78

Prepared by: Snohomish County Solid Waste 7

Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

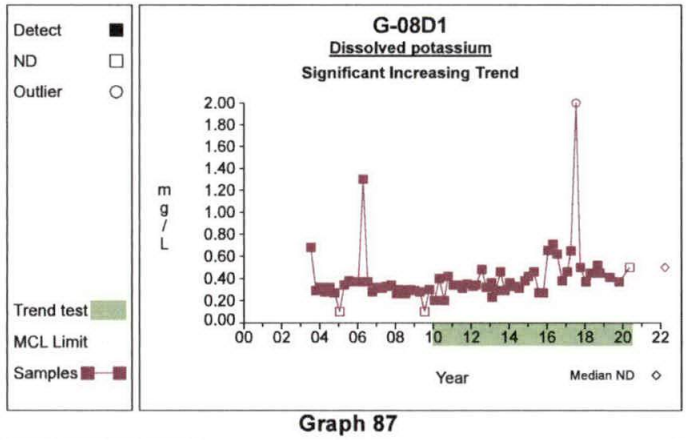
Time Series



Graph 82

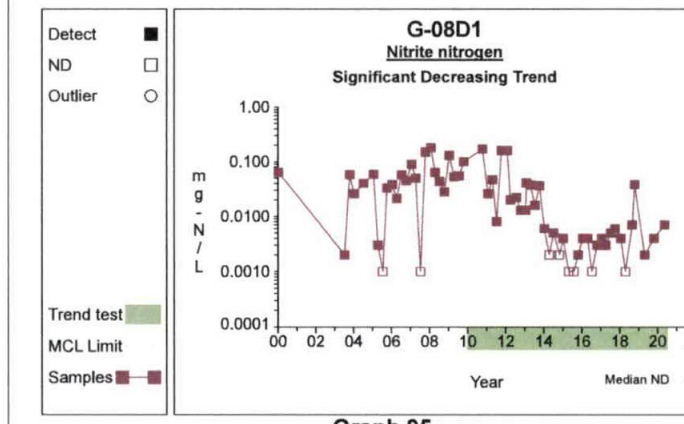
Prepared by: Snohomish County Solid Waste 8

Time Series



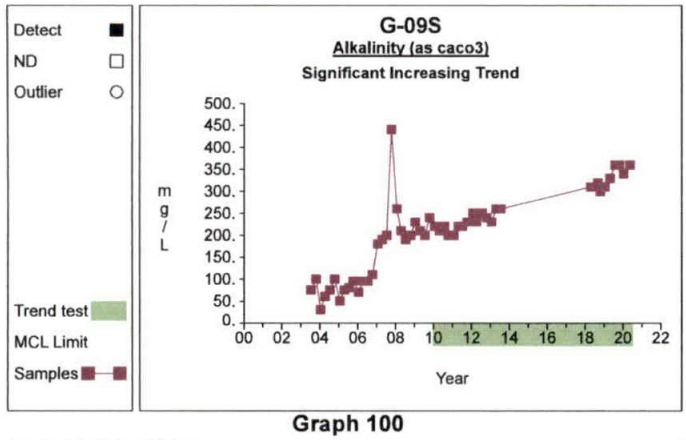
Graph 87

Time Series



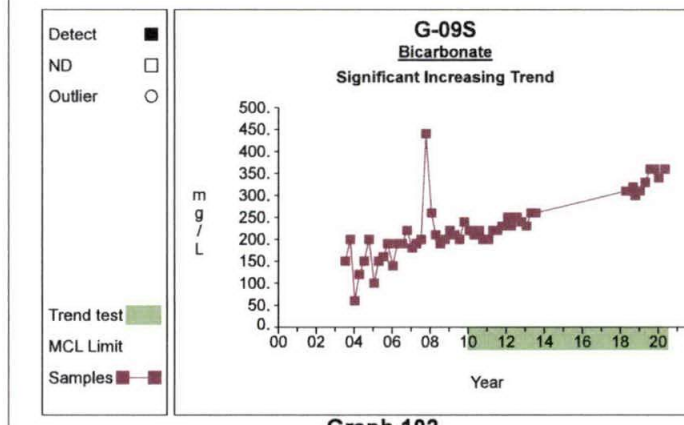
Graph 95

Time Series



Graph 100

Time Series

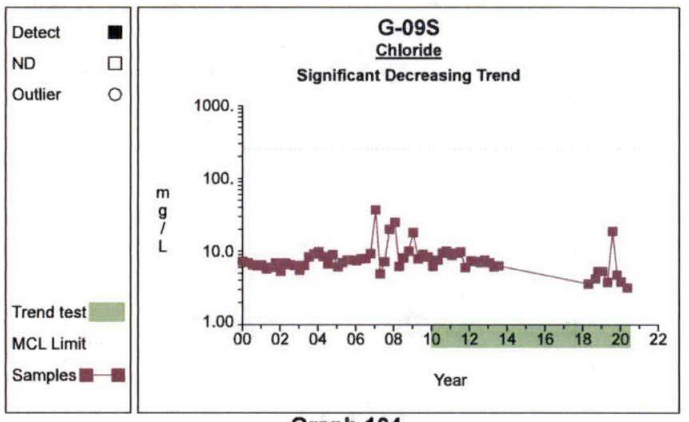


Graph 102

Cathcart Landfill [CCSHAL]

Analysis prepared on: 7/10/2020

Time Series

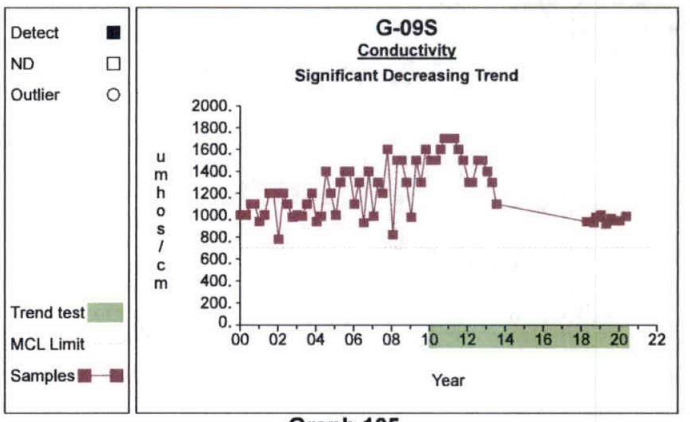


Graph 104

Cathcart Landfill [CCSHAL]

Analysis prepared on: 7/10/2020

Time Series

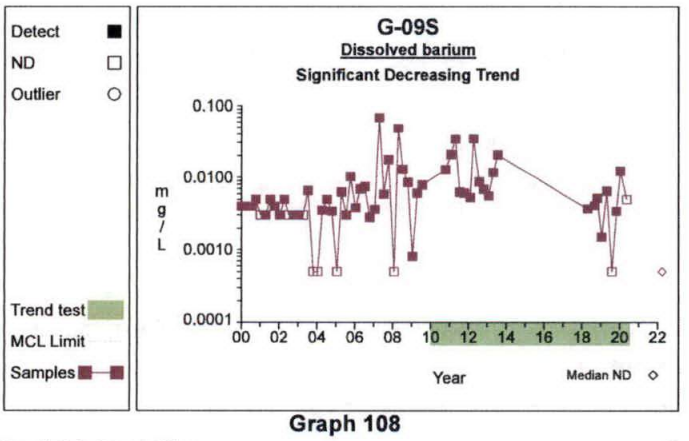


Graph 105

Cathcart Landfill [CCSHAL]

Analysis prepared on: 7/10/2020

Time Series

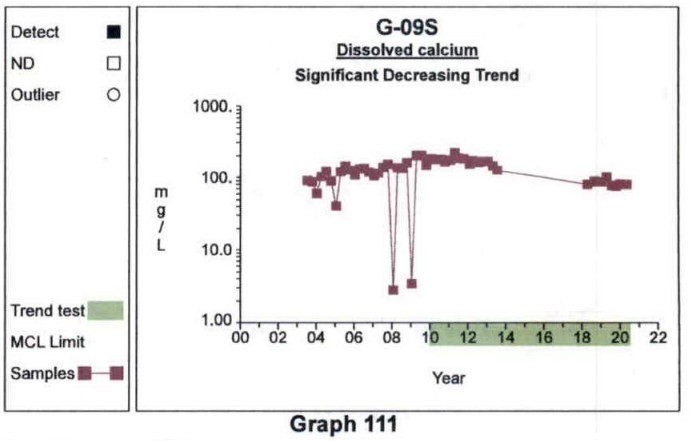


Graph 108

Cathcart Landfill [CCSHAL]

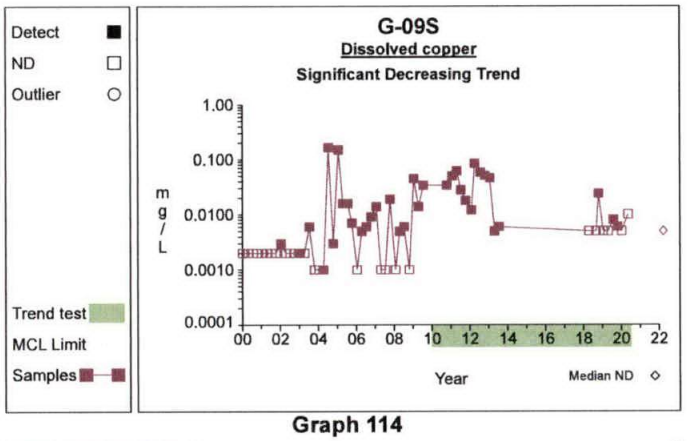
Analysis prepared on: 7/10/2020

Time Series



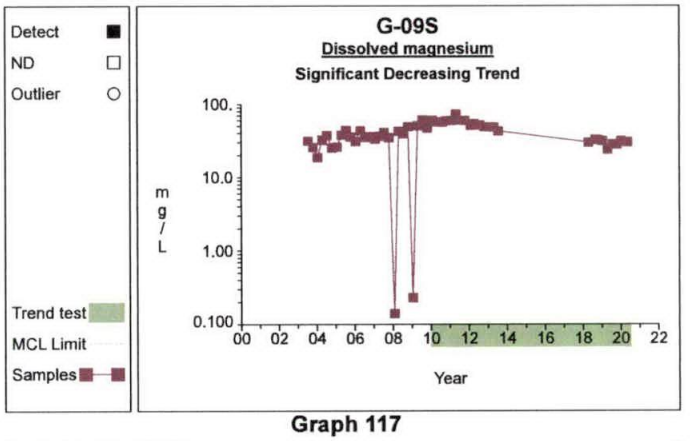
Graph 111

Time Series



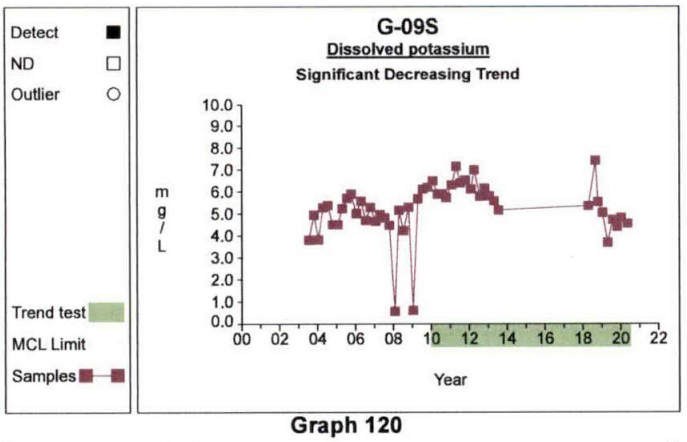
Graph 114

Time Series



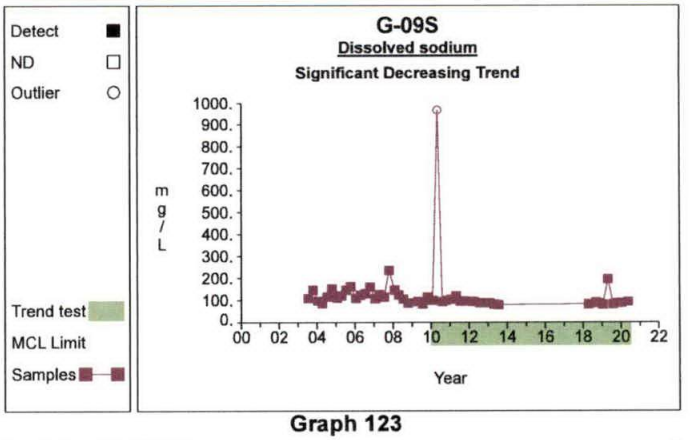
Graph 117

Time Series



Graph 120

Time Series

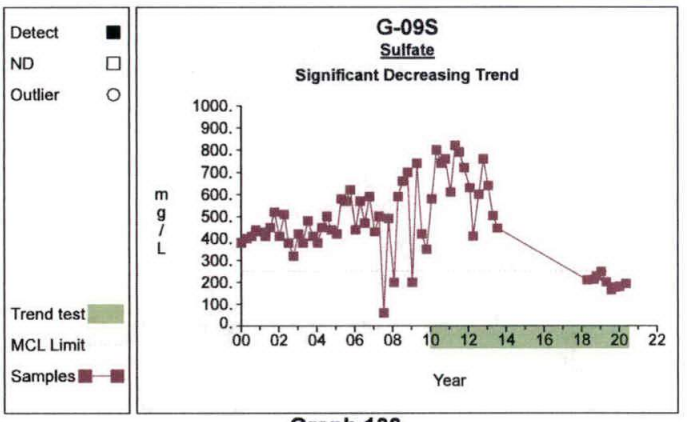


Graph 123

Cathcart Landfill [CCSHAL]

Analysis prepared on: 7/10/2020

Time Series

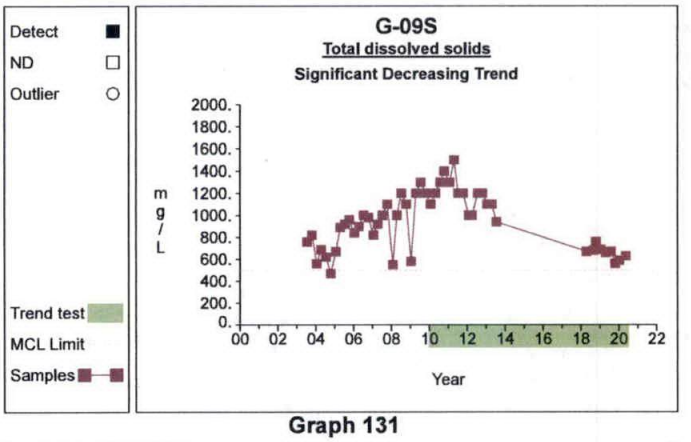


Graph 130

Cathcart Landfill [CCSHAL]

Analysis prepared on: 7/10/2020

Time Series

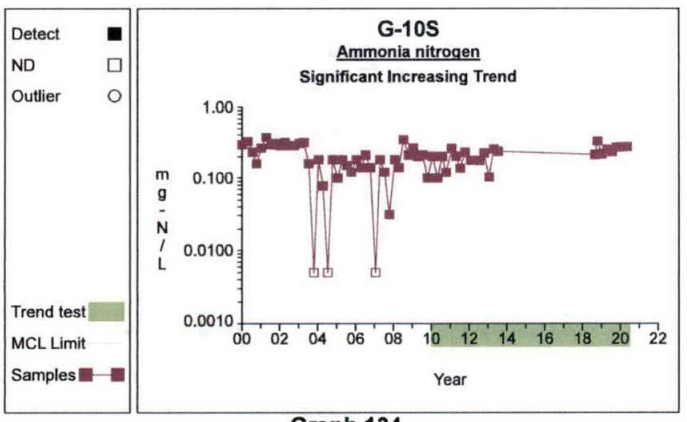


Graph 131

Cathcart Landfill [CCSHAL]

Analysis prepared on: 7/10/2020

Time Series

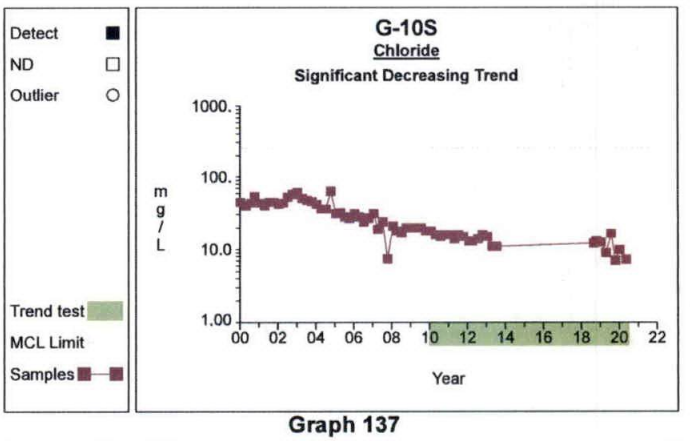


Graph 134

Cathcart Landfill [CCSHAL]

Analysis prepared on: 7/10/2020

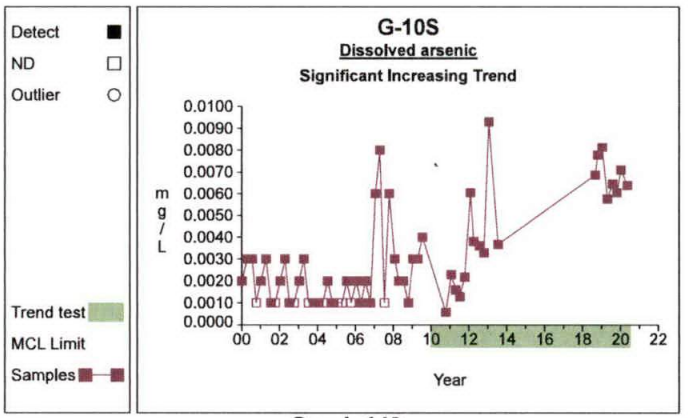
Time Series



Graph 137

Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

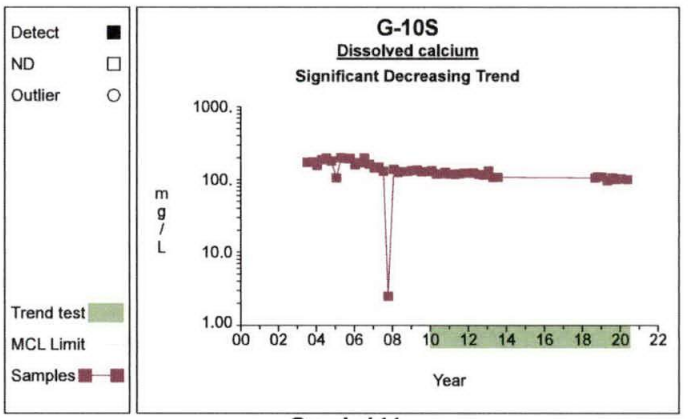
Time Series



Graph 140

Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

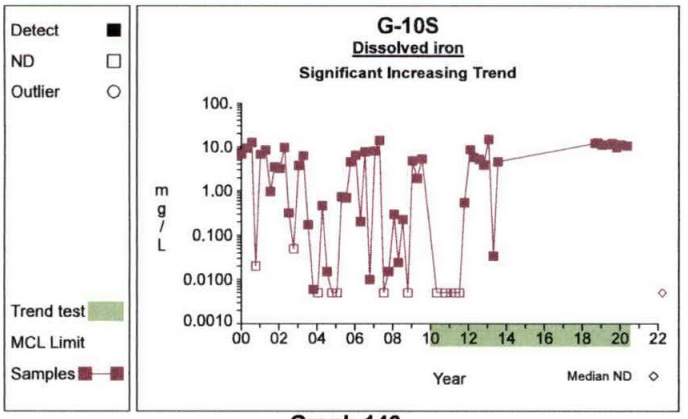
Time Series



Graph 144

Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

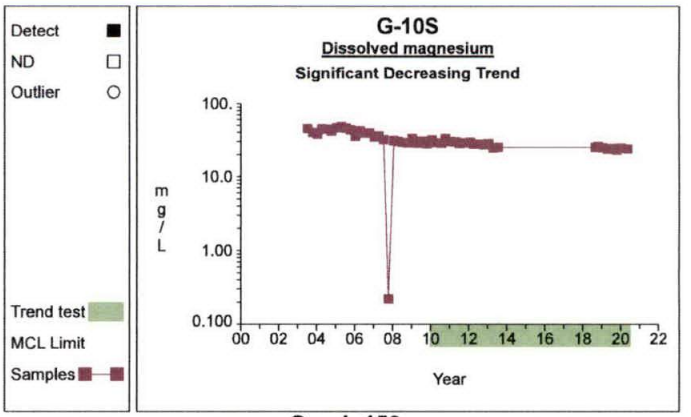
Time Series



Graph 148

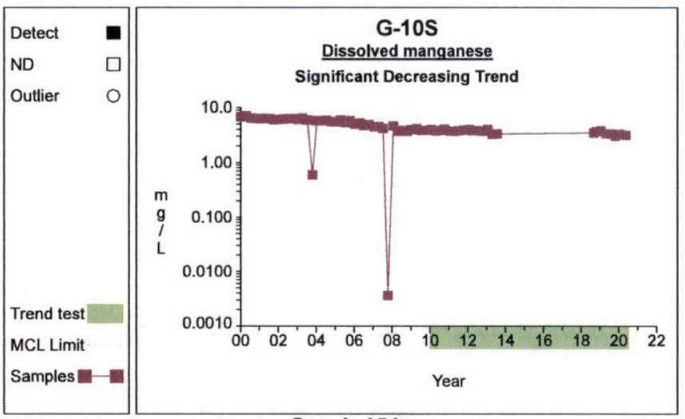
Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

Time Series



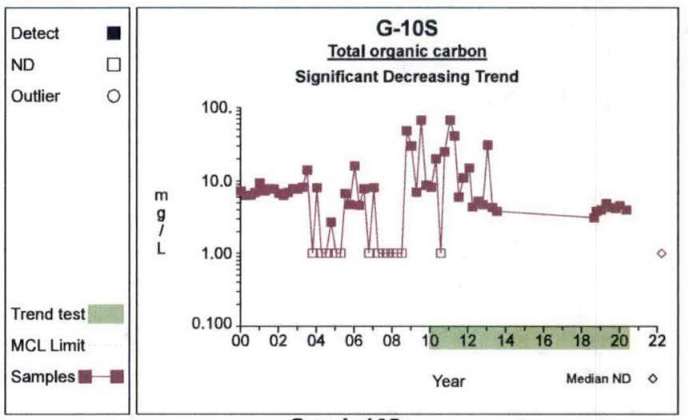
Graph 150

Time Series



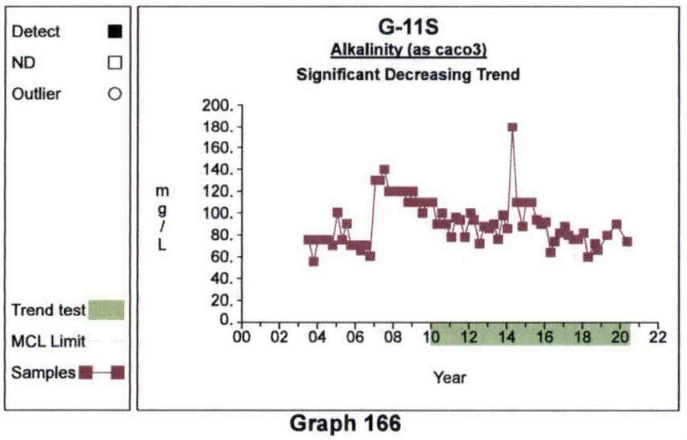
Graph 151

Time Series



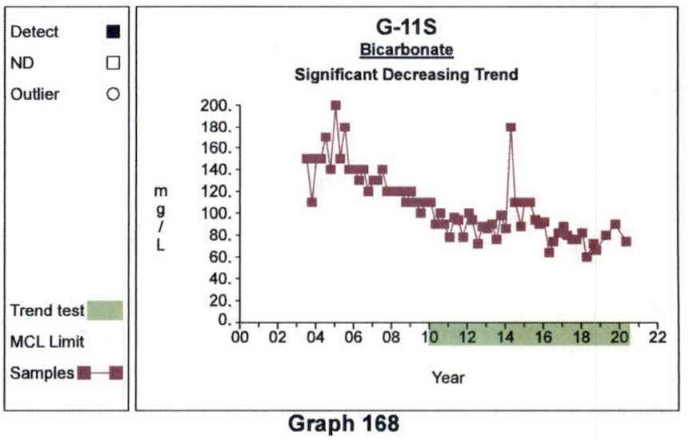
Graph 165

Time Series



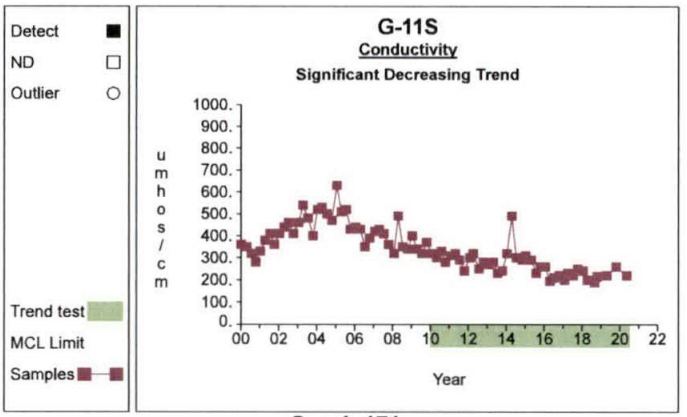
Graph 166

Time Series



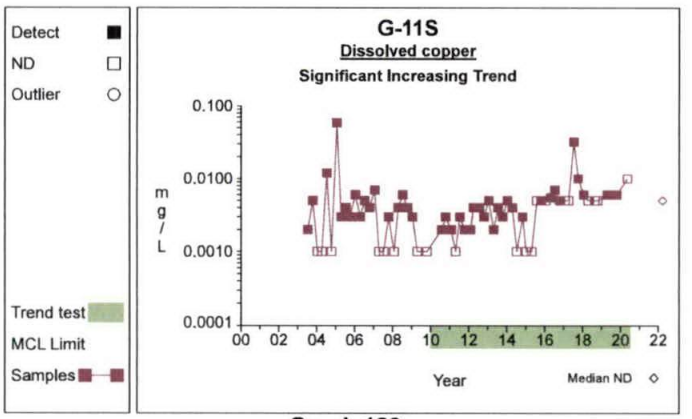
Graph 168

Time Series



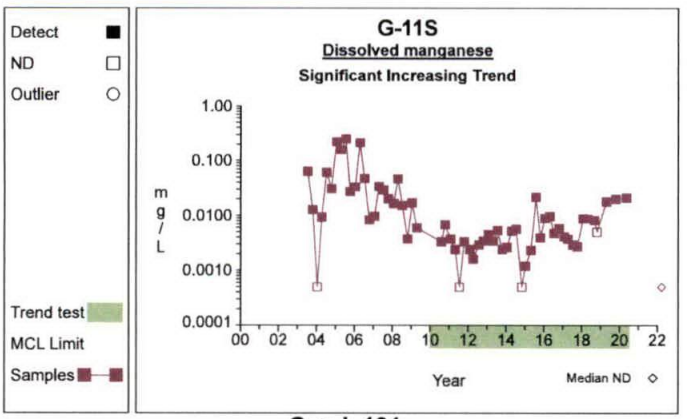
Graph 171

Time Series



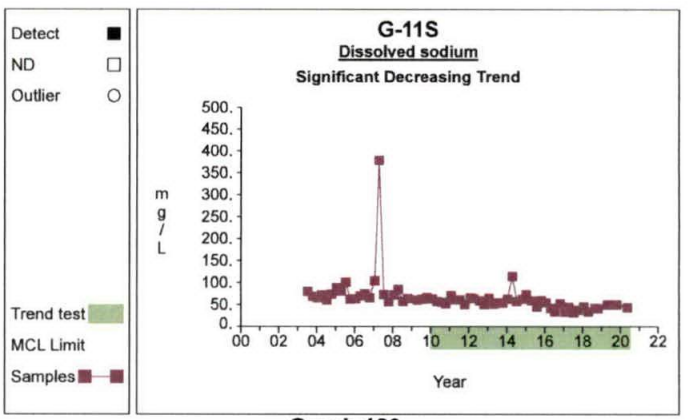
Graph 180

Time Series



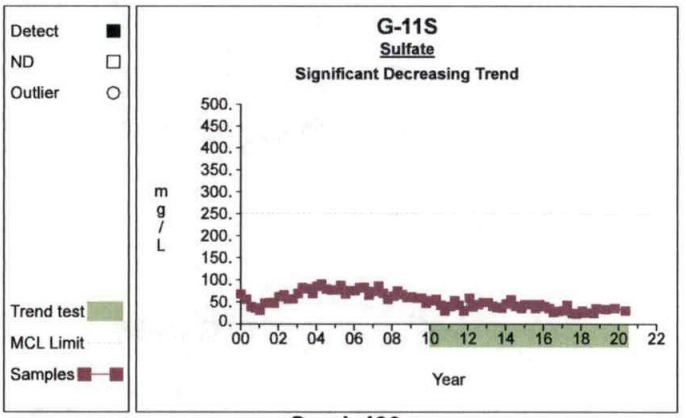
Graph 184

Time Series



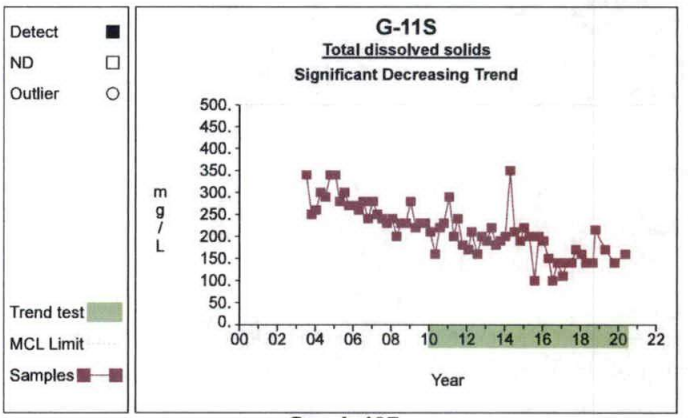
Graph 189

Time Series



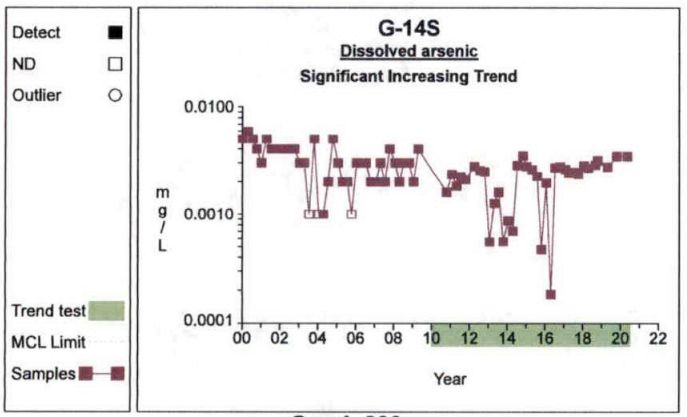
Graph 196

Time Series



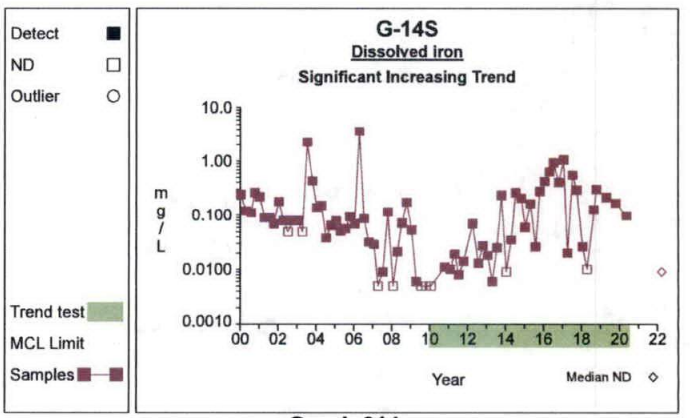
Graph 197

Time Series



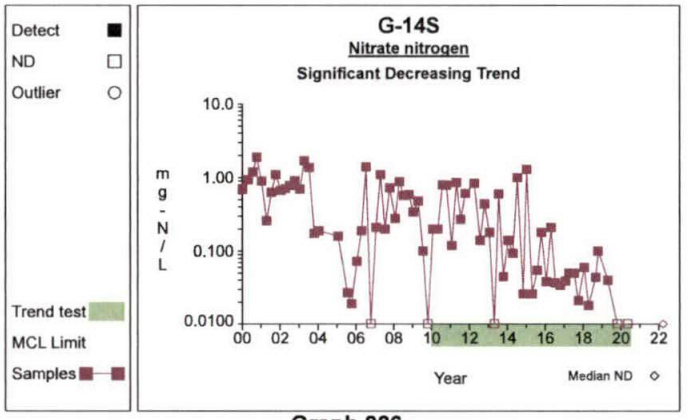
Graph 206

Time Series



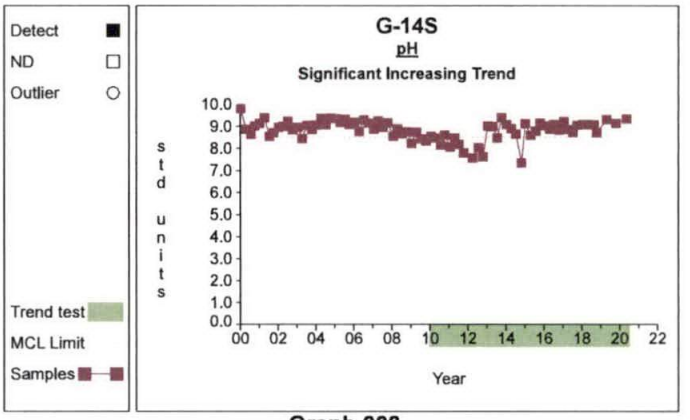
Graph 214

Time Series



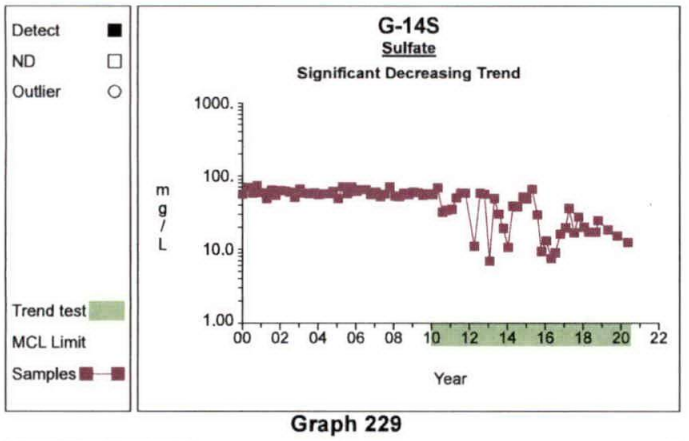
Graph 226

Time Series



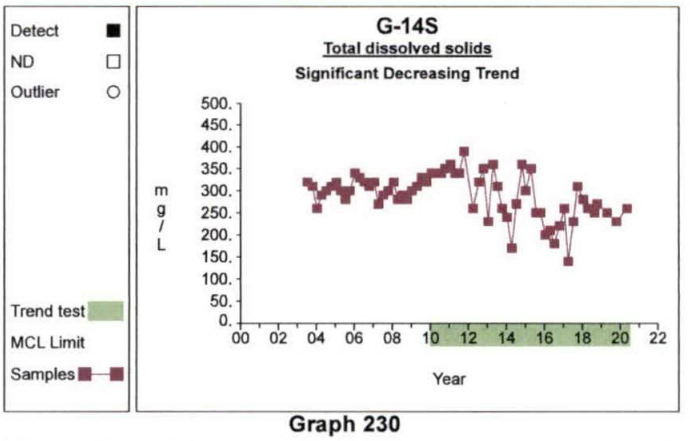
Graph 228

Time Series



Graph 229

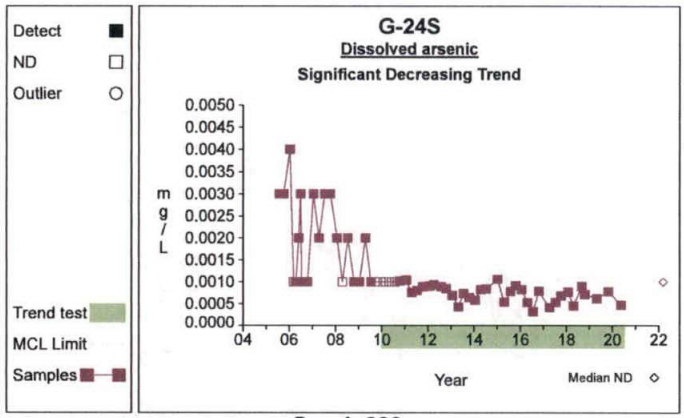
Time Series



Graph 230

Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

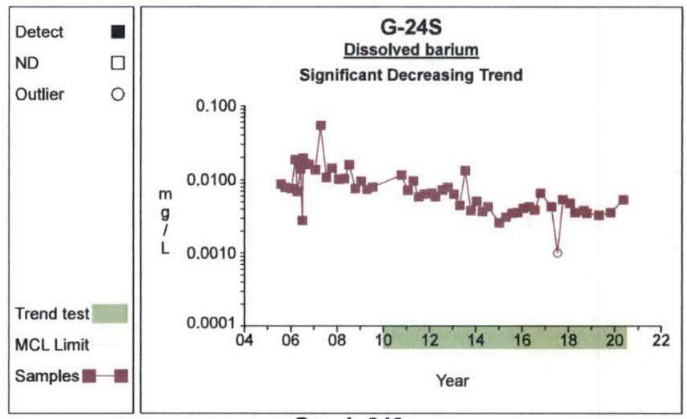
Time Series



Graph 239

Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

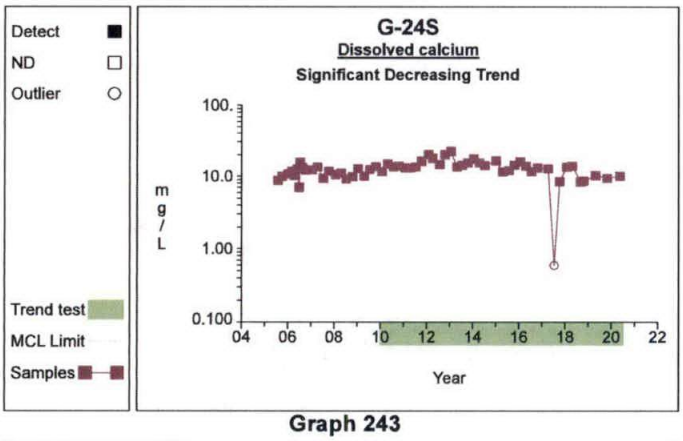
Time Series



Graph 240

Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

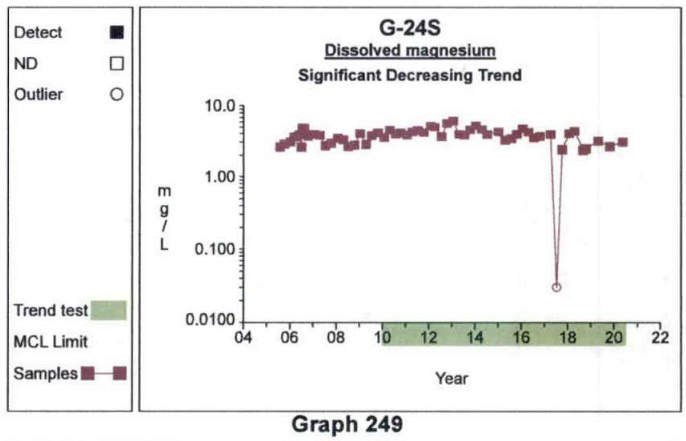
Time Series



Graph 243

Cathcart Landfill [CCSHAL] Analysis prepared on: 7/10/2020

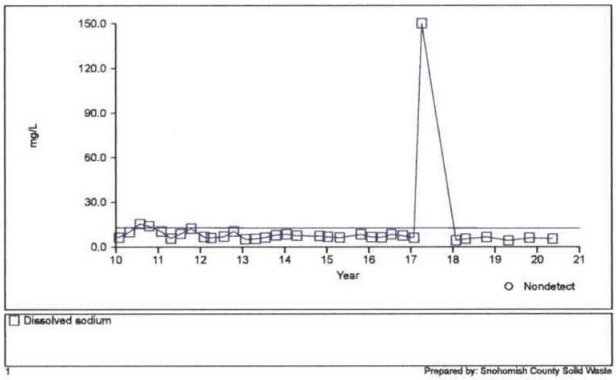
Time Series



Graph 249

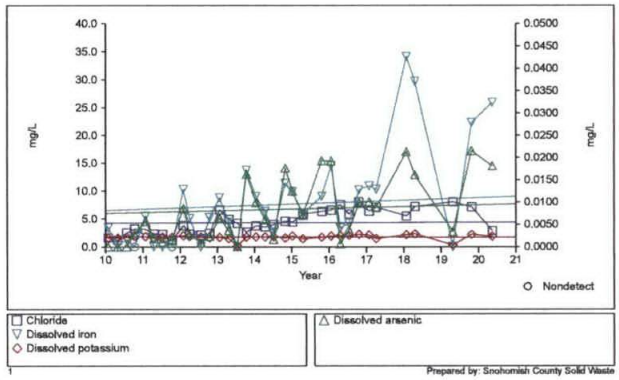
Cathcart Landfill

Time Series Plot for G-01A



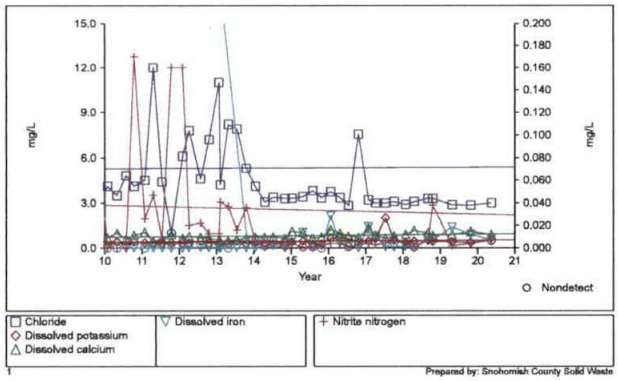
Cathcart Landfill

Time Series Plot for G-04A



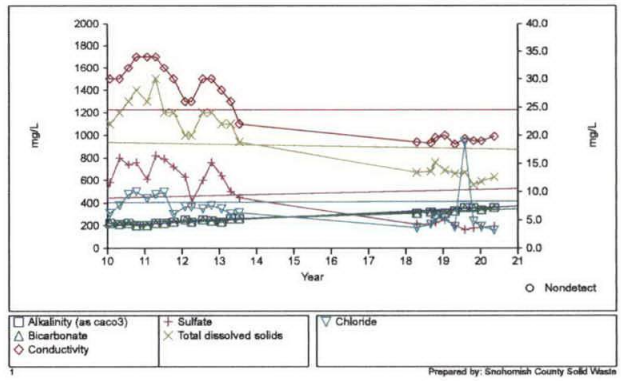
Cathcart Landfill

Time Series Plot for G-08D1



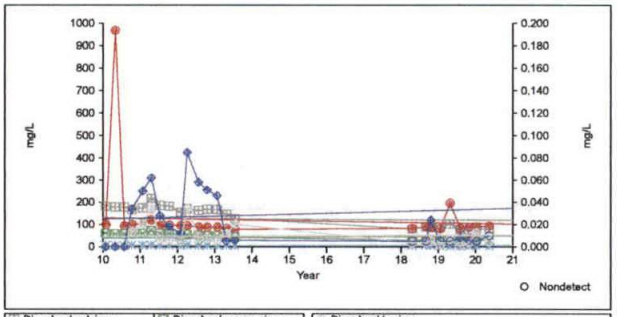
Cathcart Landfill

Time Series Plot for G-09S



Cathcart Landfill

Time Series Plot for G-09S



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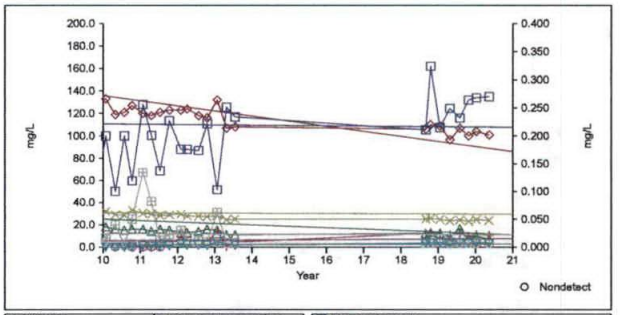
Cathcart Landfill

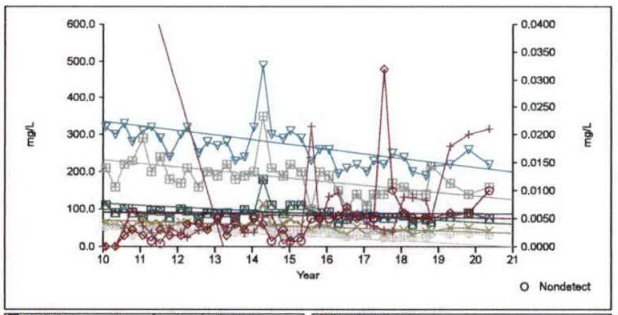
Time Series Plot for G-10S



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

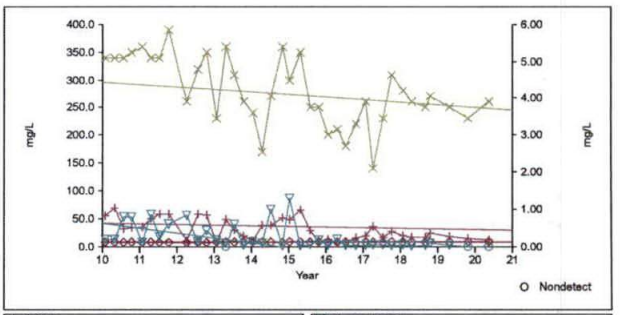
Time Series Plot for G-11S



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

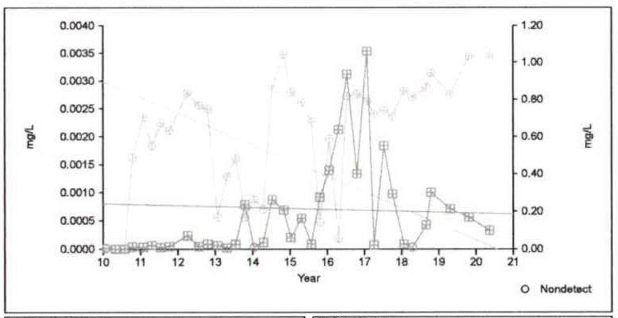
Time Series Plot for G-14S



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

Time Series Plot for G-14S



Dissolved arsenic

Dissolved iron

1

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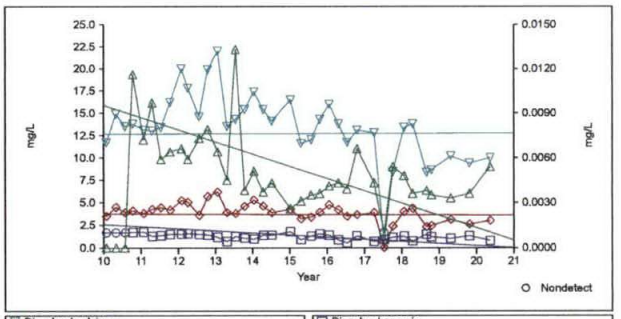
Cathcart Landfill

Time Series Plot for G-24S



Dissolved calcium

Dissolved magnesium

Dissolved arsenic

Dissolved barium

1

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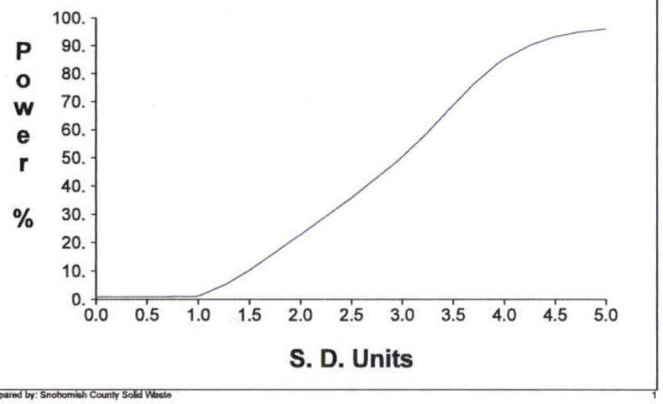
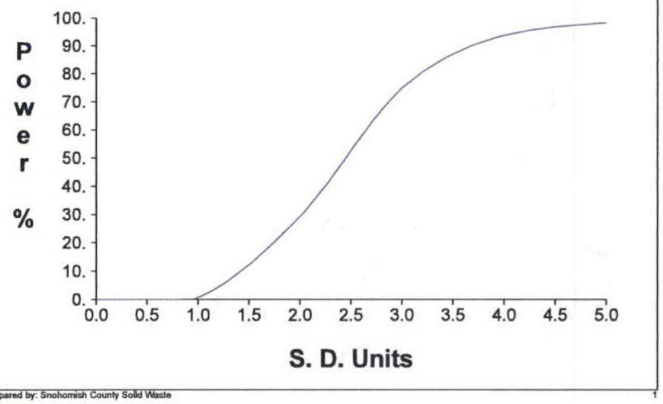
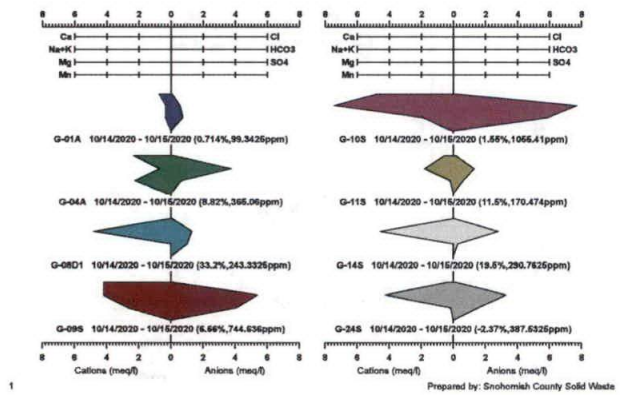
False Positive and False Negative Rates for Current Intra-Well Prediction Limits Monitoring Program



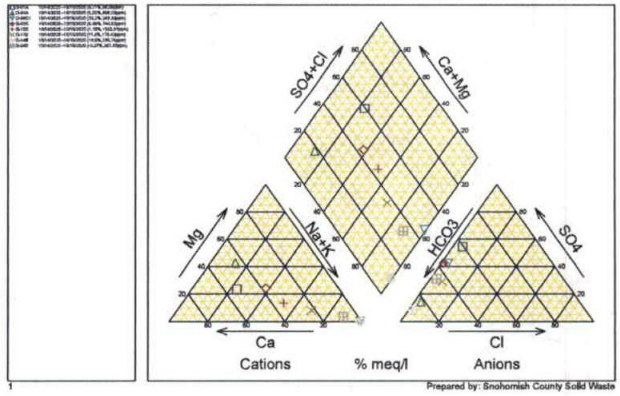
False Positive and False Negative Rates for Current Upgradient vs. Downgradient Monitoring Program



Cathcart Landfill



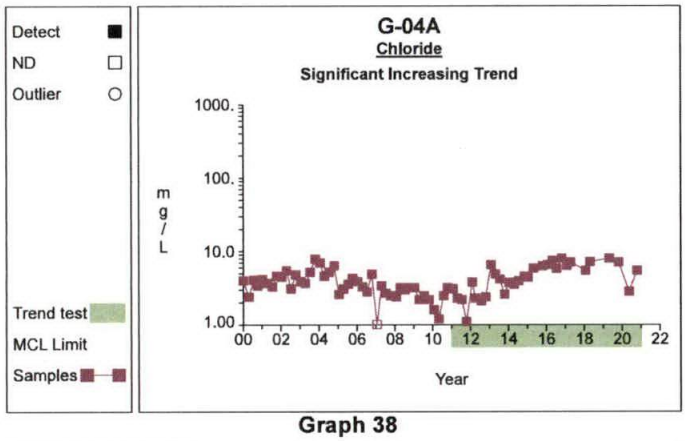
Cathcart Landfill



Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

Time Series



Graph 38

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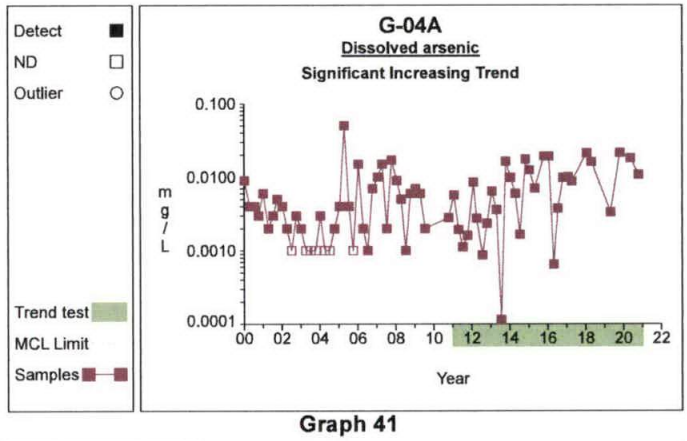
1

Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

Time Series



Graph 41

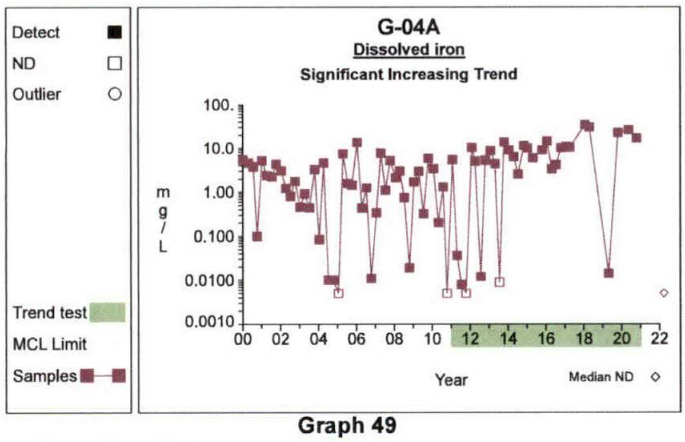
Prepared by: Snohomish County Solid Waste

2

Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

Time Series



Graph 49

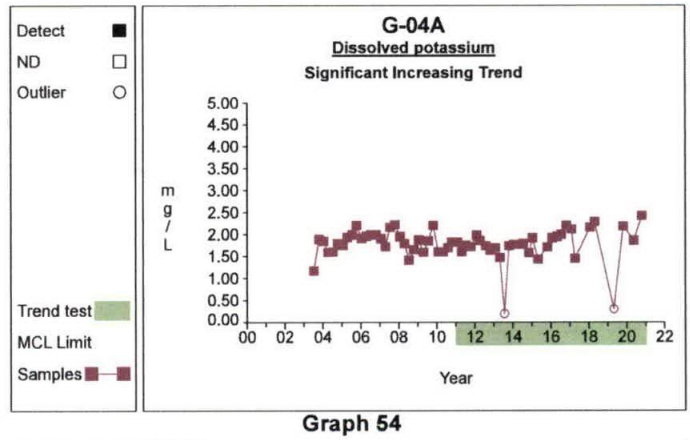
Prepared by: Snohomish County Solid Waste

3

Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

Time Series



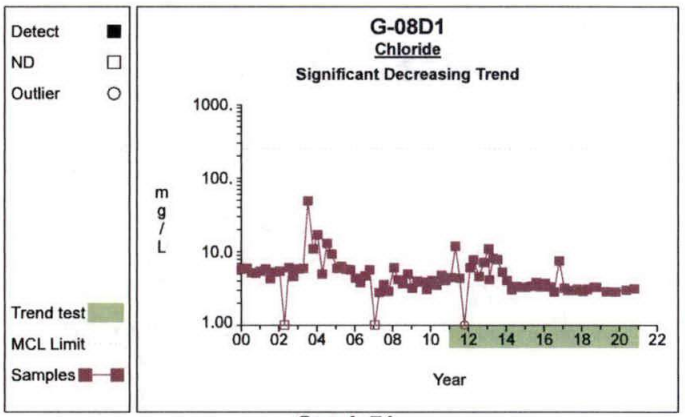
Graph 54

Prepared by: Snohomish County Solid Waste

4

Cathcart Landfill [CCSHAL] Analysis prepared on: 11/24/2020

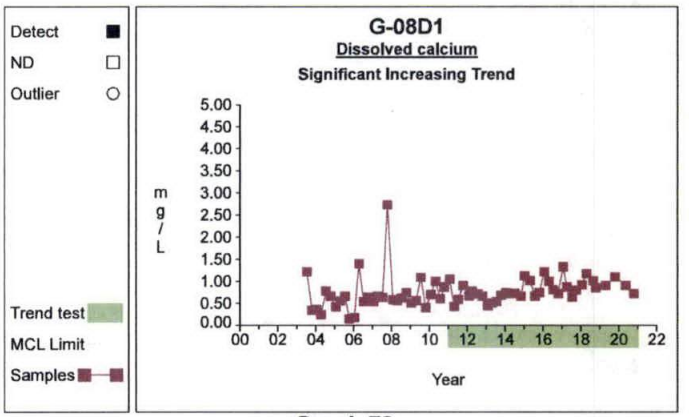
Time Series



Graph 71

Cathcart Landfill [CCSHAL] Analysis prepared on: 11/24/2020

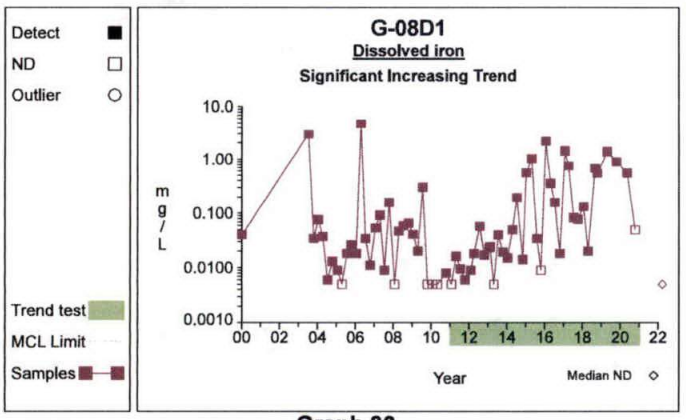
Time Series



Graph 78

Cathcart Landfill [CCSHAL] Analysis prepared on: 11/24/2020

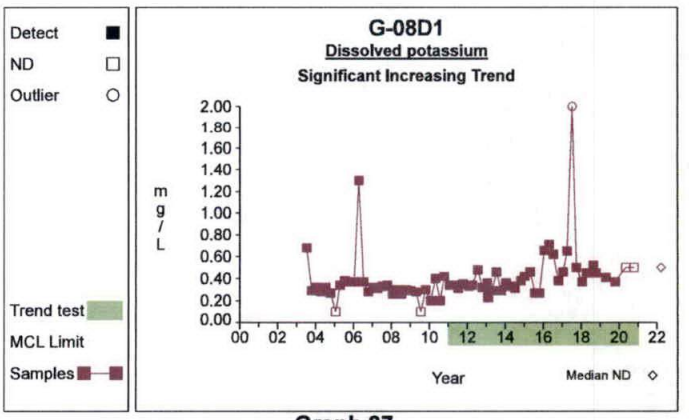
Time Series



Graph 82

Cathcart Landfill [CCSHAL] Analysis prepared on: 11/24/2020

Time Series

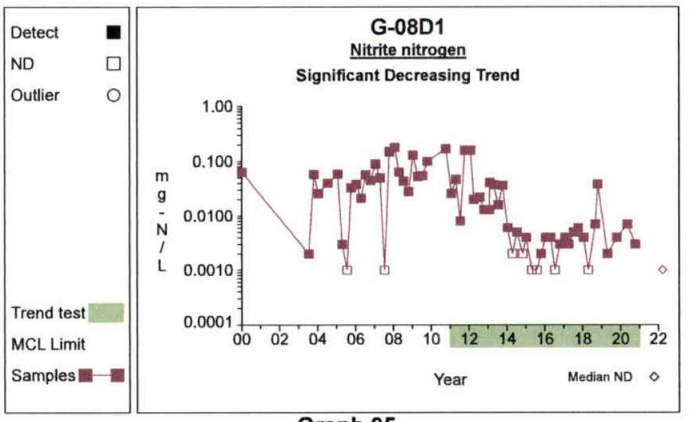


Graph 87

Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

Time Series

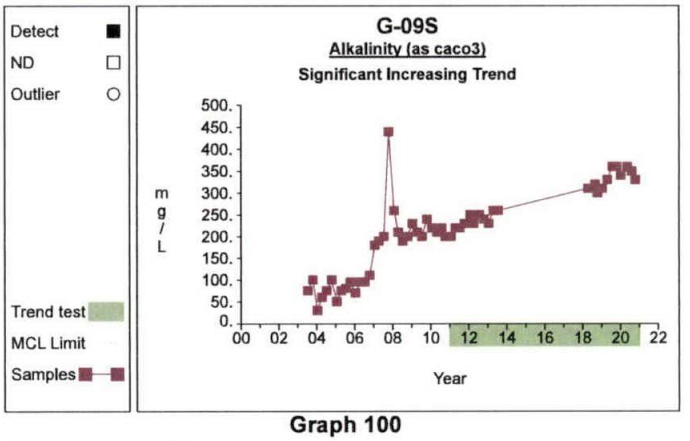


Graph 95

Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

Time Series

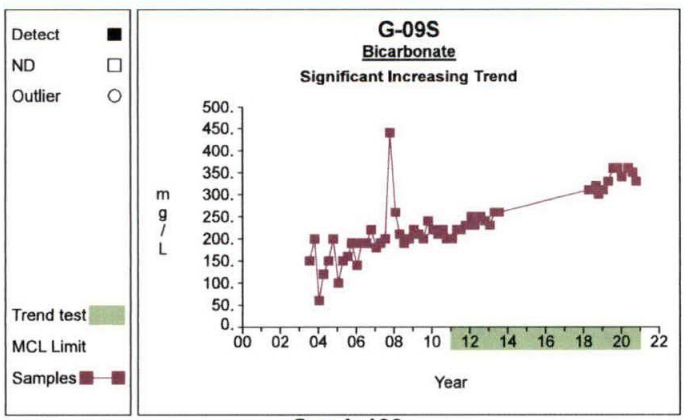


Graph 100

Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

Time Series

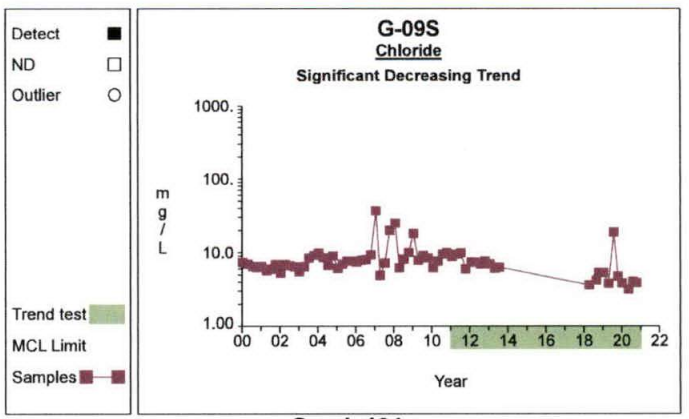


Graph 102

Cathcart Landfill [CCSHAL]

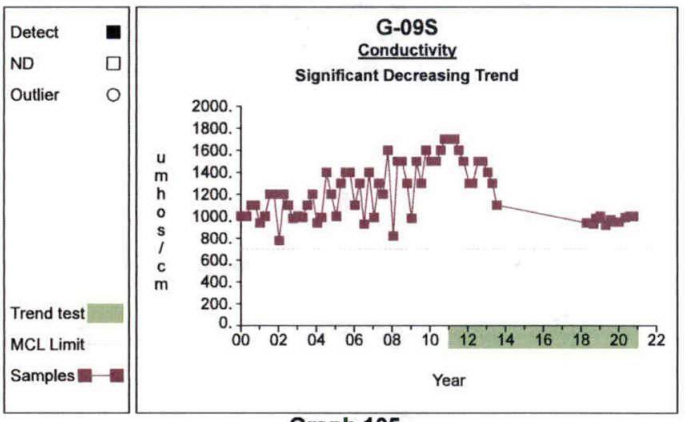
Analysis prepared on: 11/24/2020

Time Series



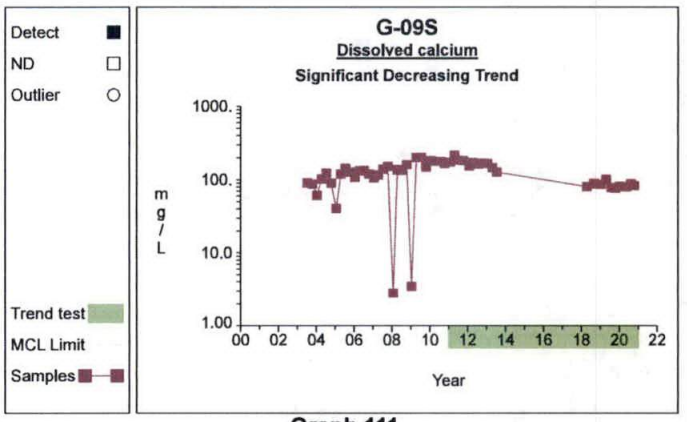
Graph 104

Time Series



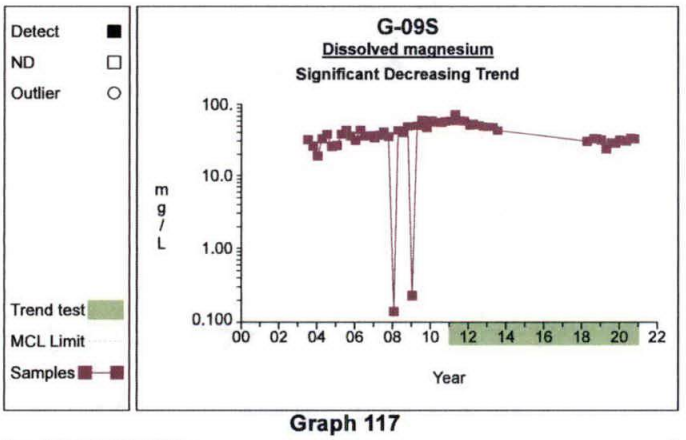
Graph 105

Time Series



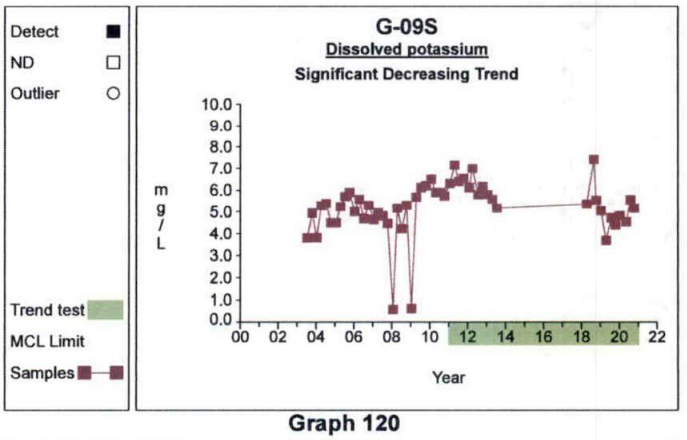
Graph 111

Time Series



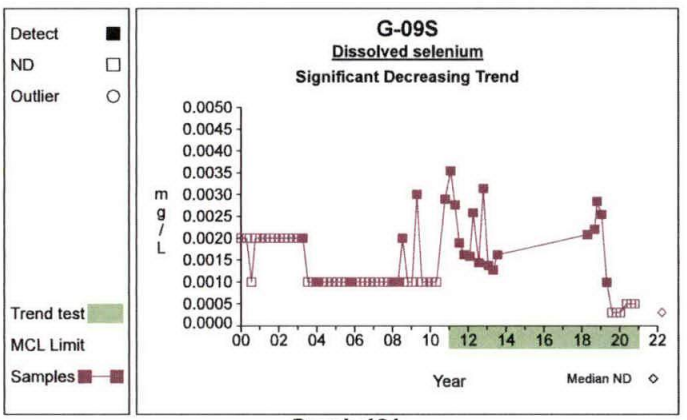
Graph 117

Time Series



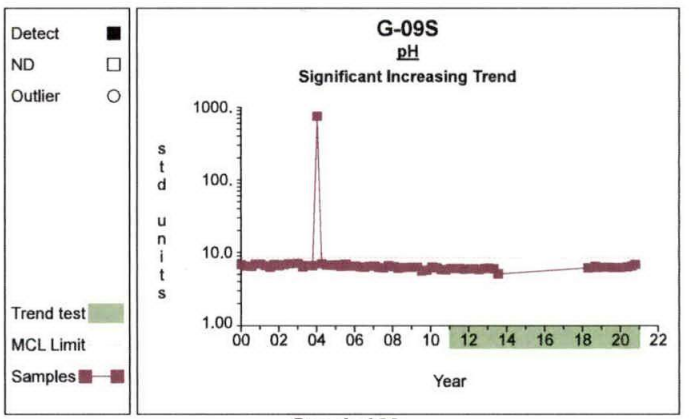
Graph 120

Time Series



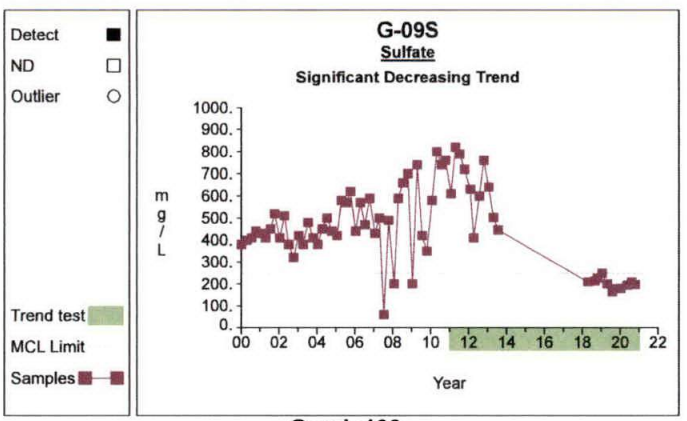
Graph 121

Time Series



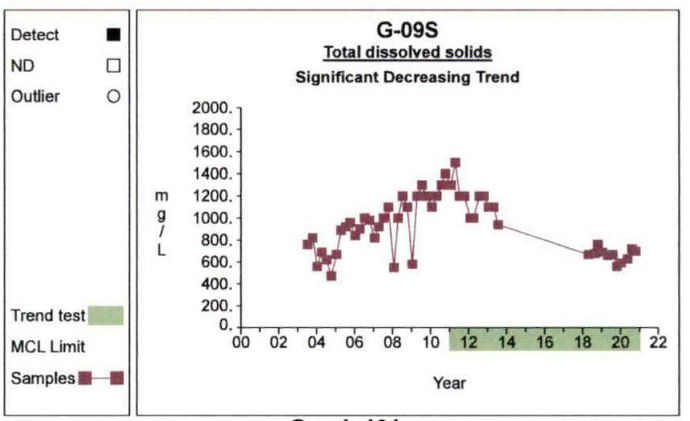
Graph 129

Time Series



Graph 130

Time Series

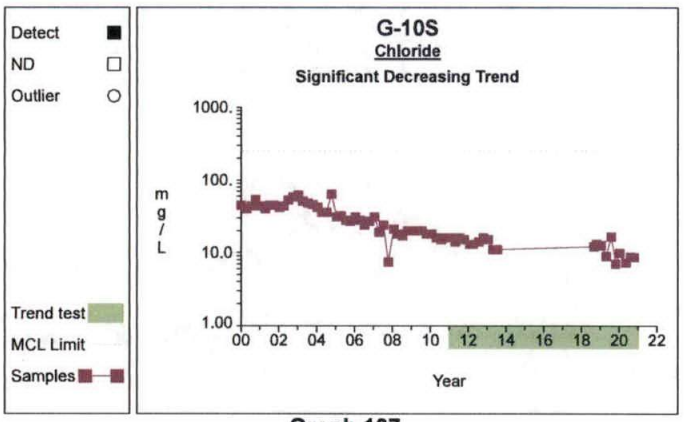


Graph 131

Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

Time Series

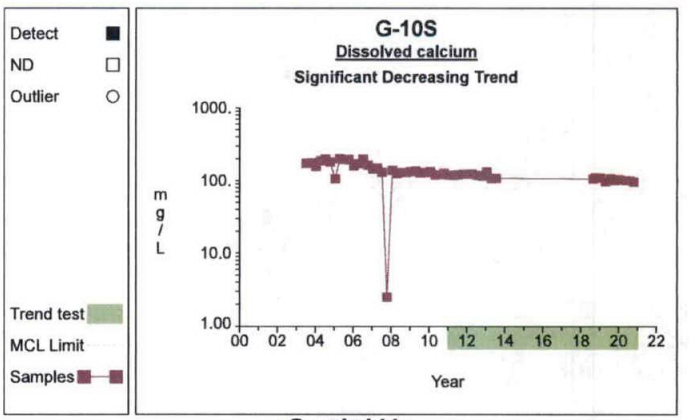


Graph 137

Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

Time Series

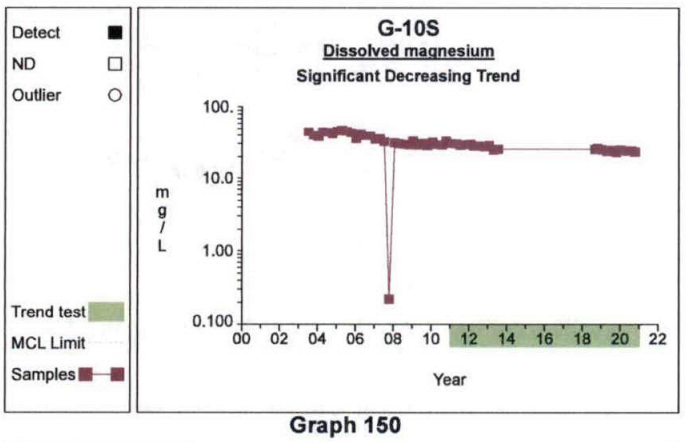


Graph 144

Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

Time Series

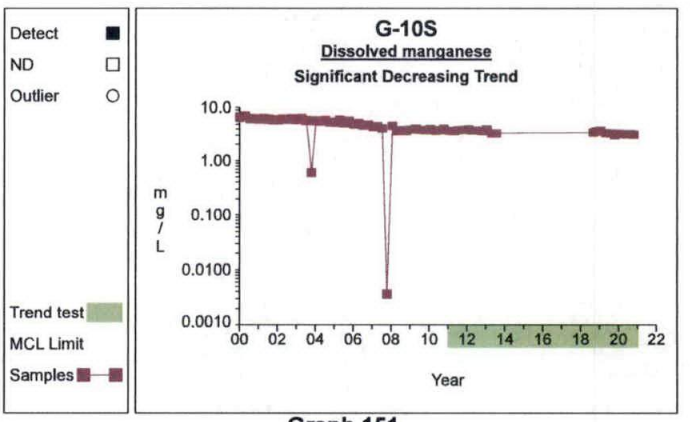


Graph 150

Cathcart Landfill [CCSHAL]

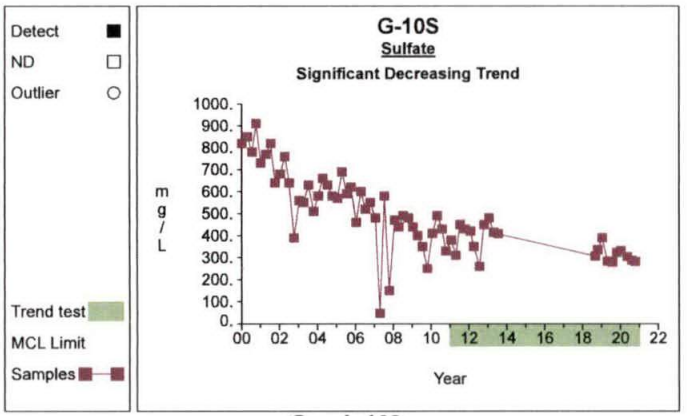
Analysis prepared on: 11/24/2020

Time Series



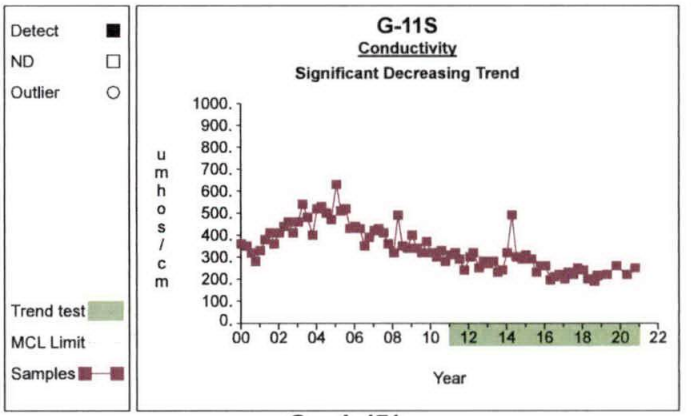
Graph 151

Time Series



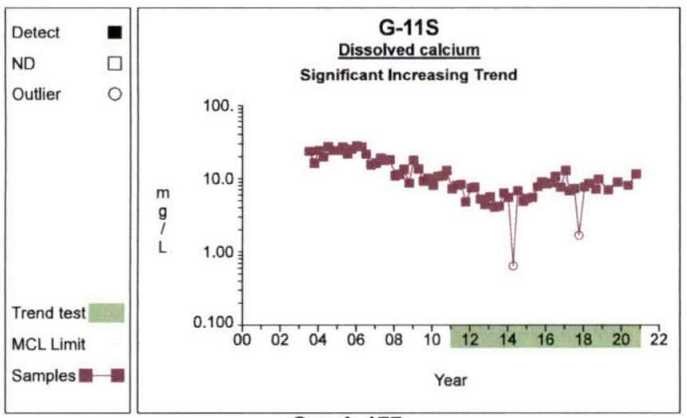
Graph 163

Time Series



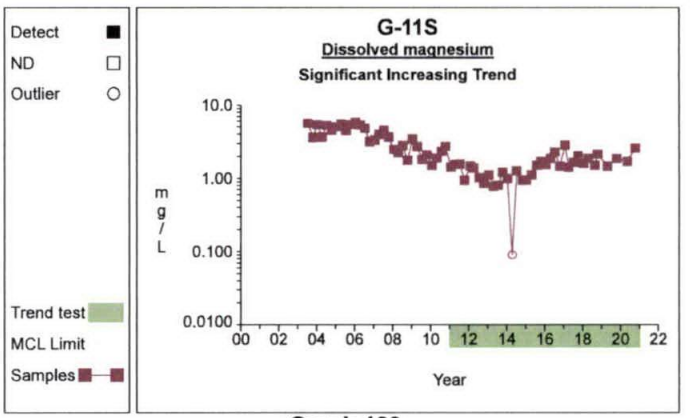
Graph 171

Time Series



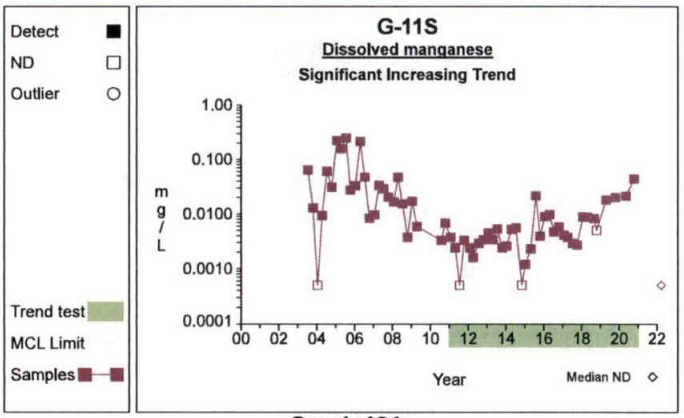
Graph 177

Time Series



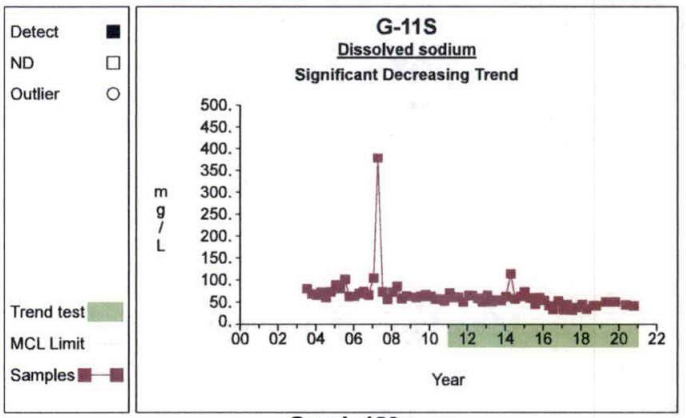
Graph 183

Time Series



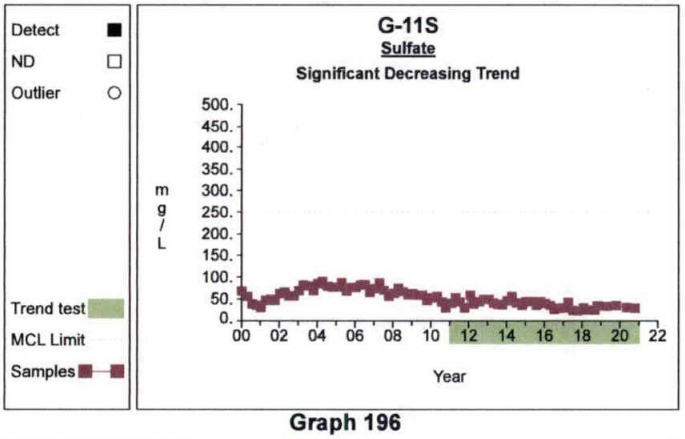
Graph 184

Time Series



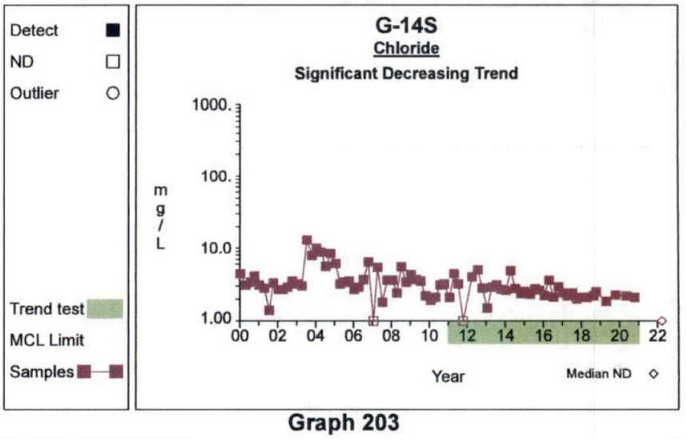
Graph 189

Time Series



Graph 196

Time Series

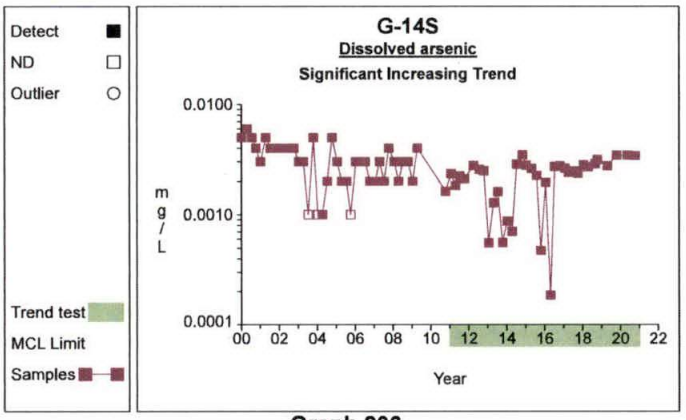


Graph 203

Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

Time Series

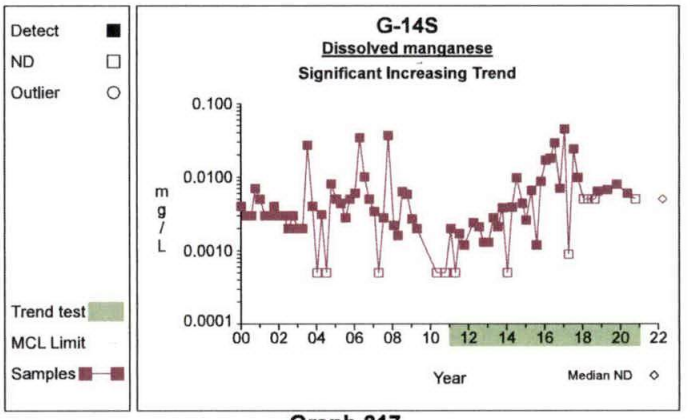


Graph 206

Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

Time Series

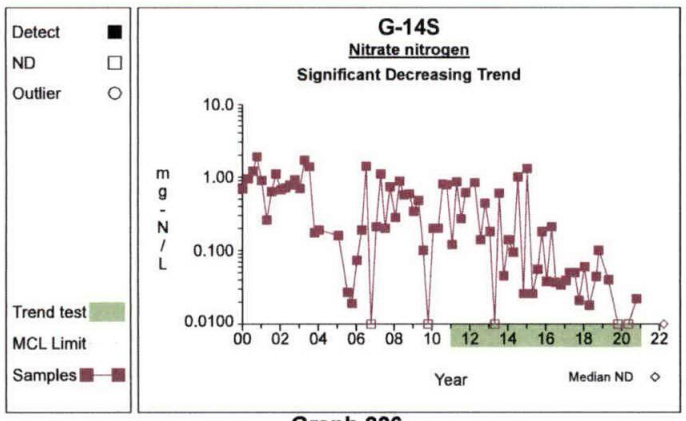


Graph 217

Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

Time Series

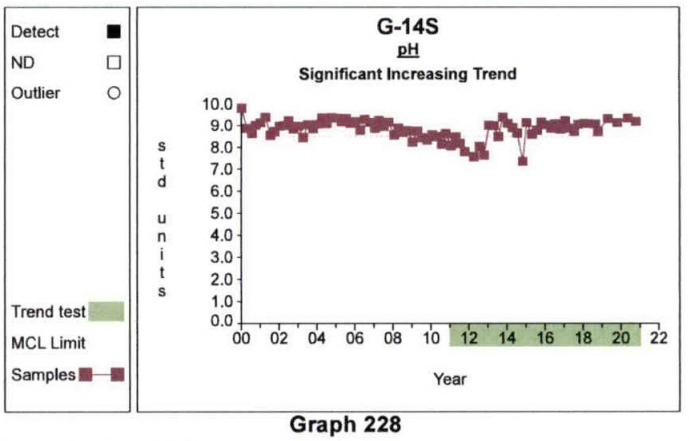


Graph 226

Cathcart Landfill [CCSHAL]

Analysis prepared on: 11/24/2020

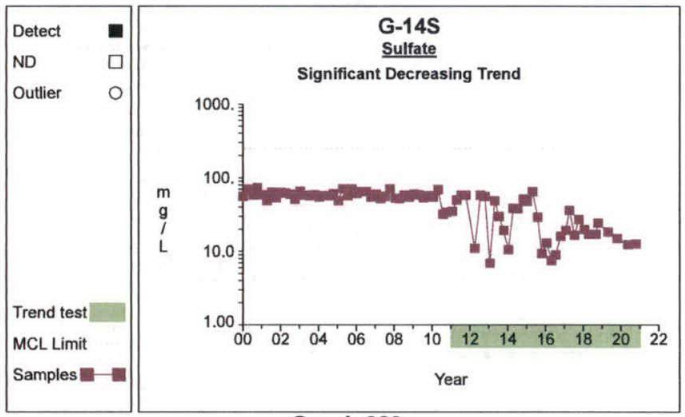
Time Series



Graph 228

Cathcart Landfill [CCSHAL] Analysis prepared on: 11/24/2020

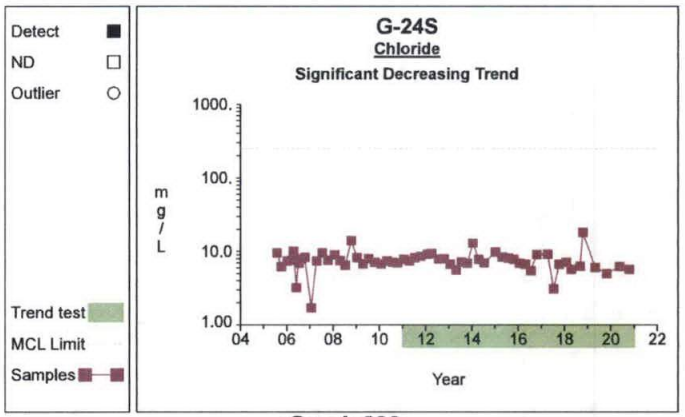
Time Series



Graph 229

Cathcart Landfill [CCSHAL] Analysis prepared on: 11/24/2020

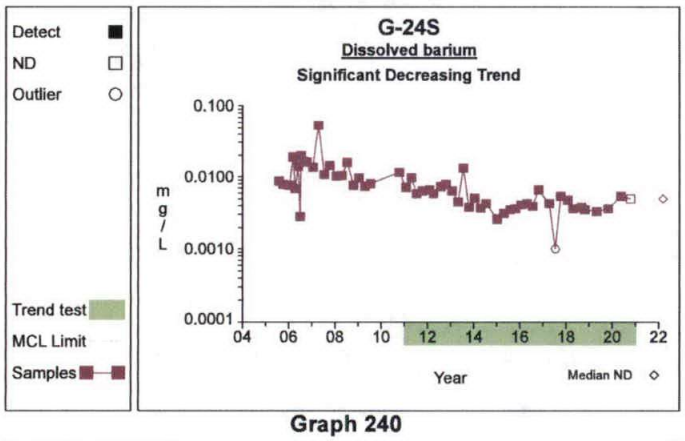
Time Series



Graph 236

Cathcart Landfill [CCSHAL] Analysis prepared on: 11/24/2020

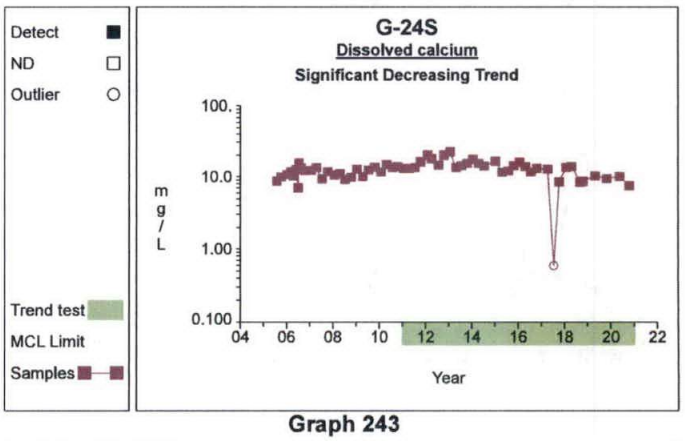
Time Series



Graph 240

Cathcart Landfill [CCSHAL] Analysis prepared on: 11/24/2020

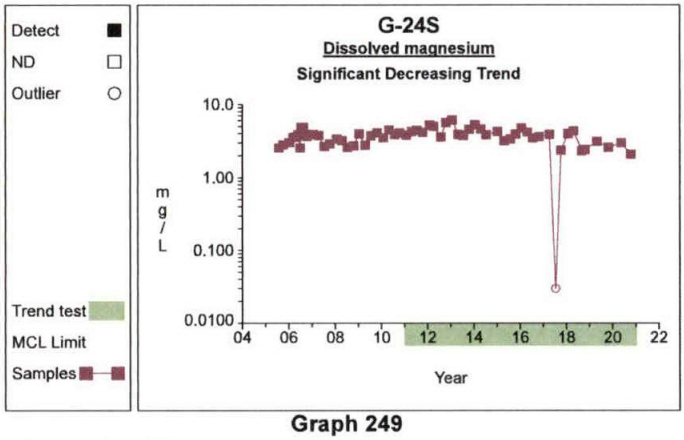
Time Series



Graph 243

Cathcart Landfill [CCSHAL] Analysis prepared on: 11/24/2020

Time Series

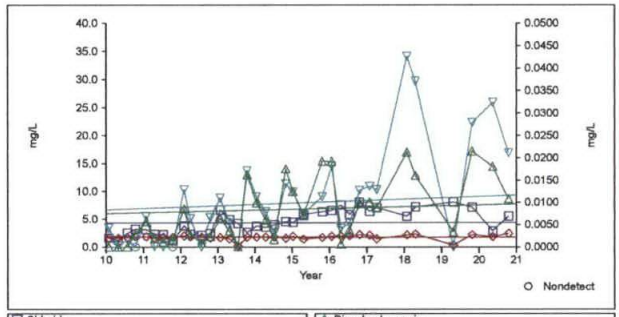


Graph 249

Prepared by: Snohomish County Solid Waste 41

Cathcart Landfill

Time Series Plot for G-04A



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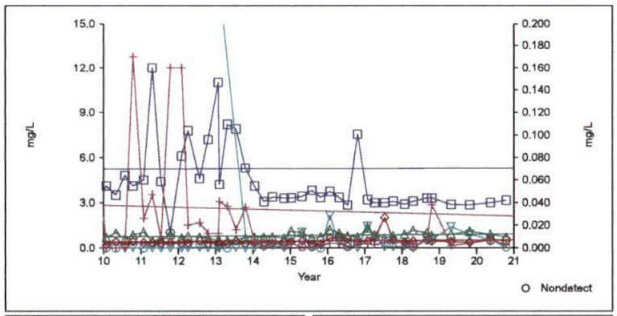
Cathcart Landfill

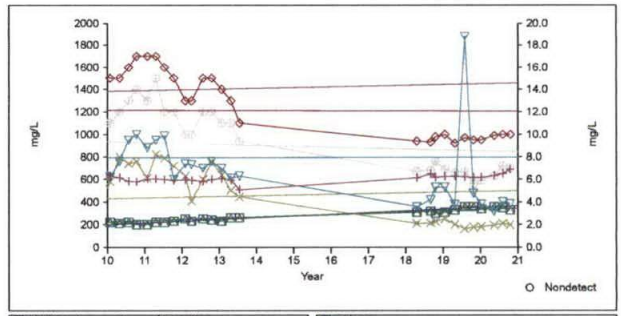
Time Series Plot for G-08D1



1 Prepared by: Snohomish County Solid Waste

Cathcart Landfill

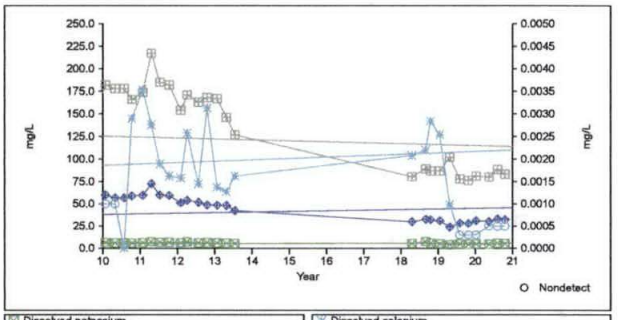
Time Series Plot for G-09S



1 Prepared by: Snohomish County Solid Waste

Cathcart Landfill

Time Series Plot for G-09S



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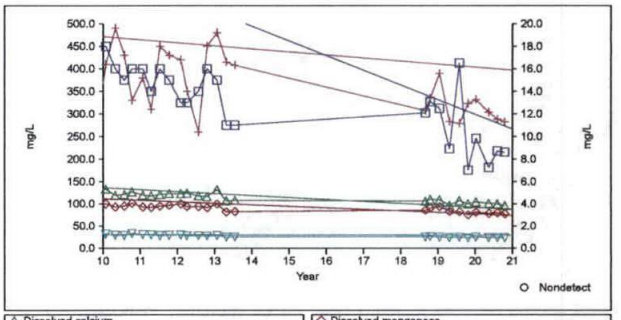
Cathcart Landfill

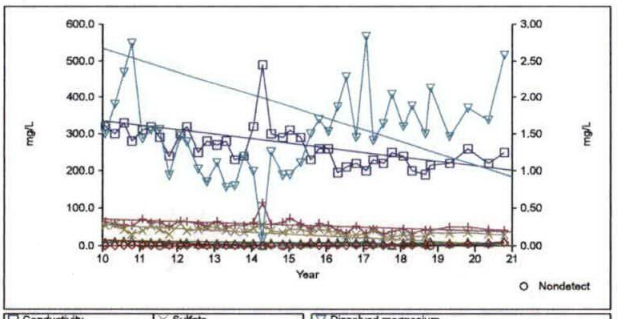
Time Series Plot for G-10S



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

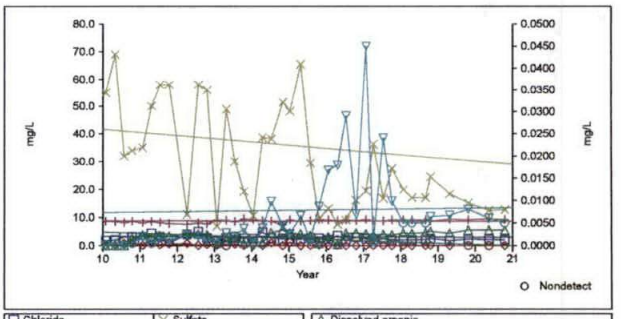
Time Series Plot for G-11S



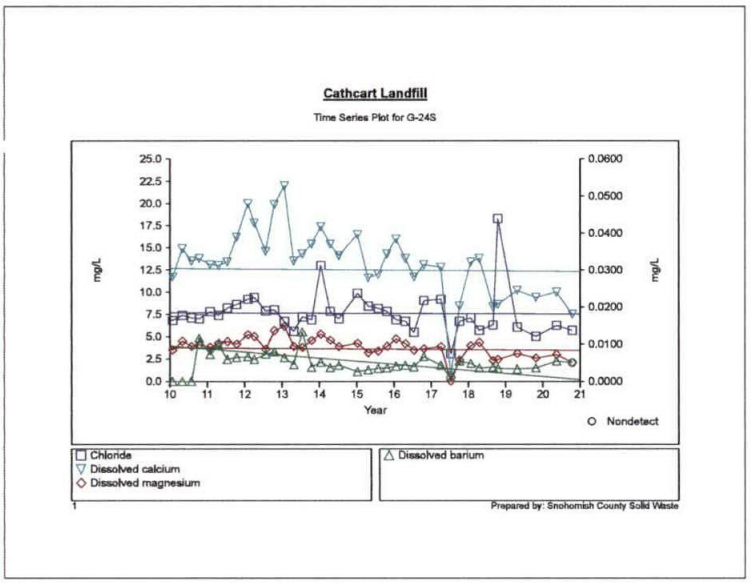
Prepared by: Snohomish County Solid Waste

Cathcart Landfill

Time Series Plot for G-14S

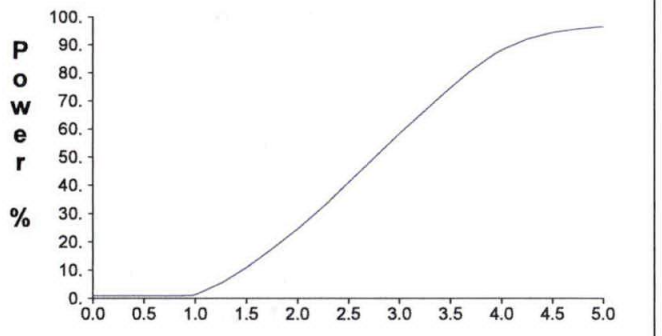


Prepared by: Snohomish County Solid Waste

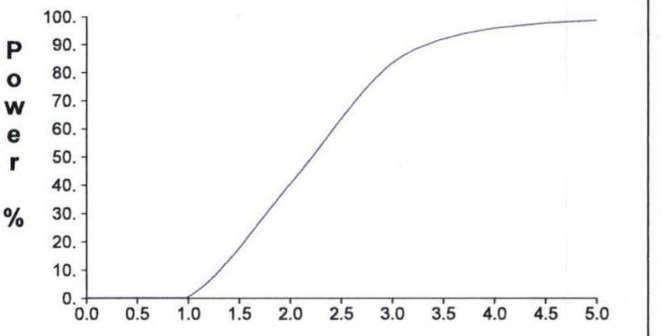

Cathcart Landfill
Time Series Plot for G-24S
mg/L
mg/L
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
0.0600
0.0500
0.0400
0.0300
0.0200
0.0100
0.0000
10
11
12
13
14
15
16
17
18
19
20
21
Year
Nondetect
Chloride
Dissolved calcium
Dissolved magnesium
Dissolved barium
1
Prepared by: Snohomish County Solid Waste

Deep Wells

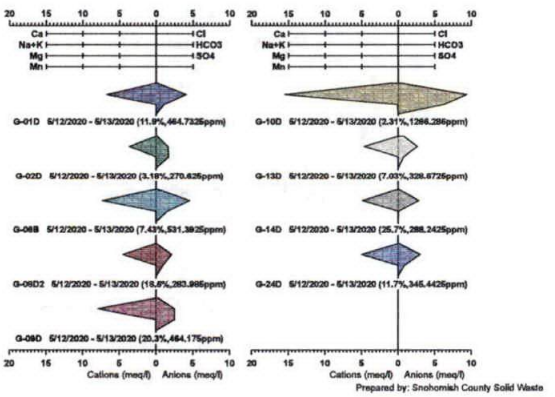
False Positive and False Negative Rates for Current Intra-Well Prediction Limits Monitoring Program



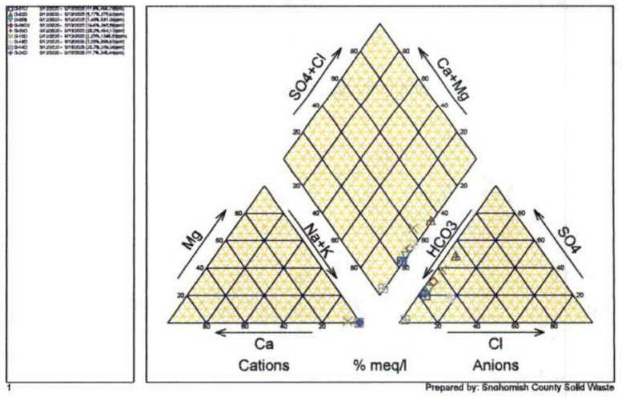
False Positive and False Negative Rates for Current Upgradient vs. Downgradient Monitoring Program



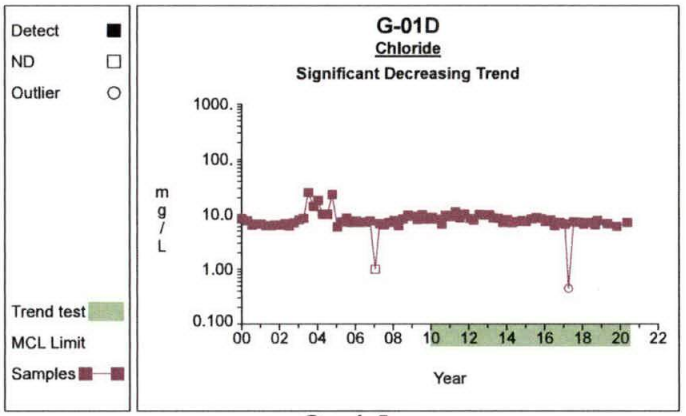
Cathcart Landfill



Cathcart Landfill

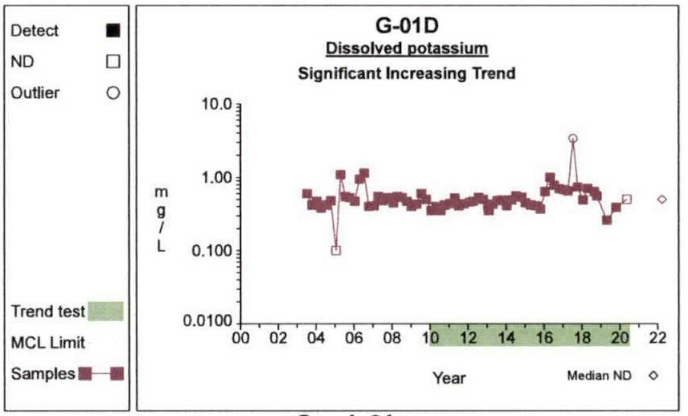


Time Series



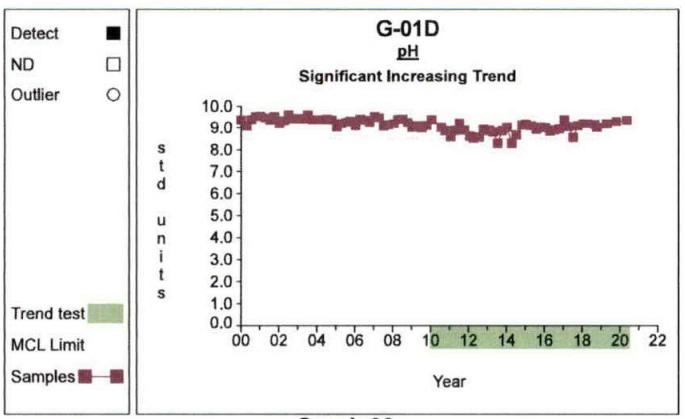
Graph 5

Time Series



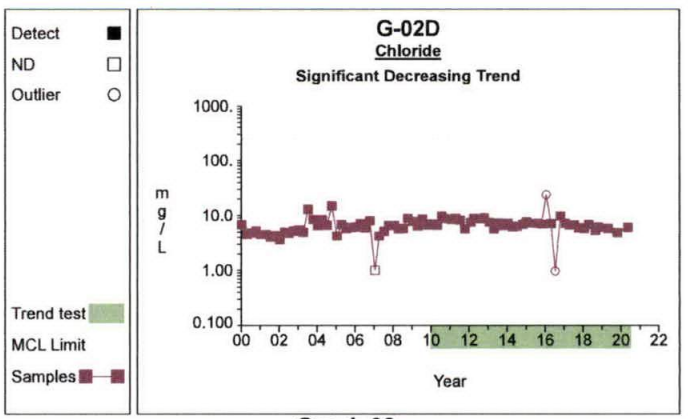
Graph 21

Time Series



Graph 30

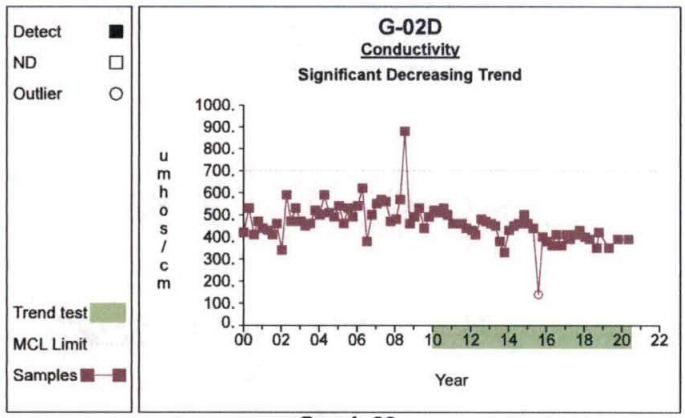
Time Series



Graph 38

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

Time Series

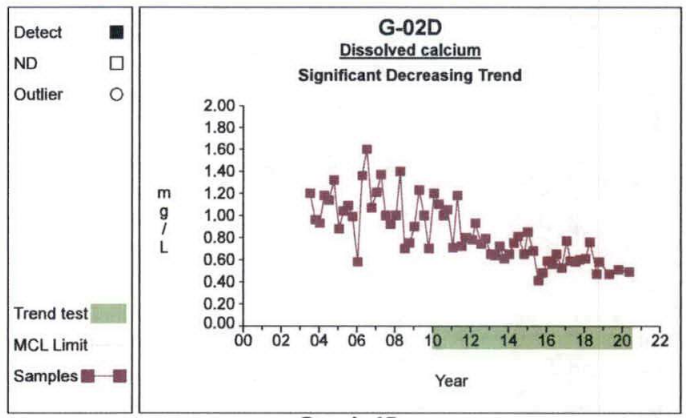


Graph 39

Prepared by: Snohomish County Solid Waste 5

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

Time Series

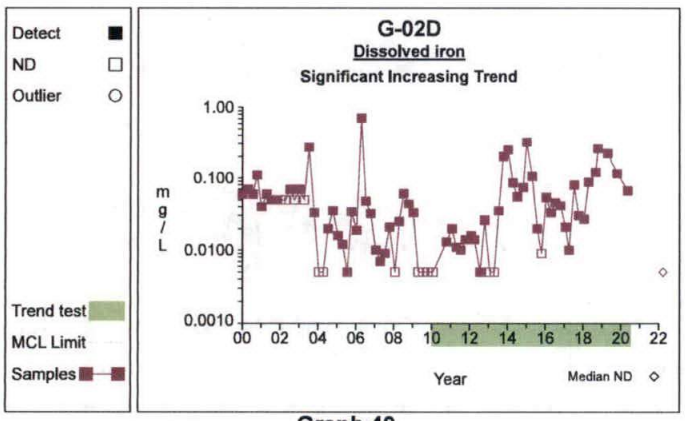


Graph 45

Prepared by: Snohomish County Solid Waste 6

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

Time Series

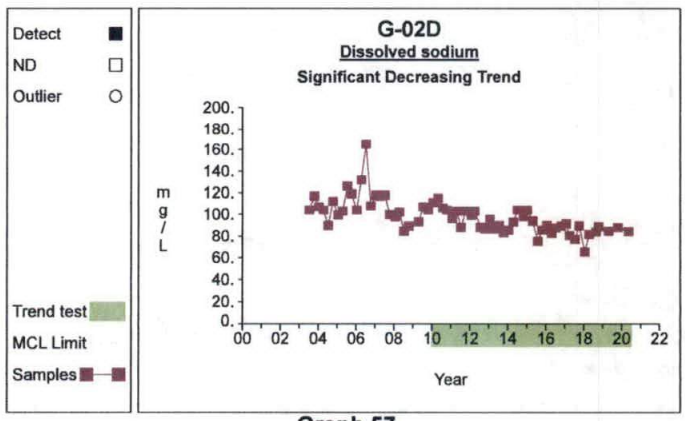


Graph 49

Prepared by: Snohomish County Solid Waste 7

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

Time Series

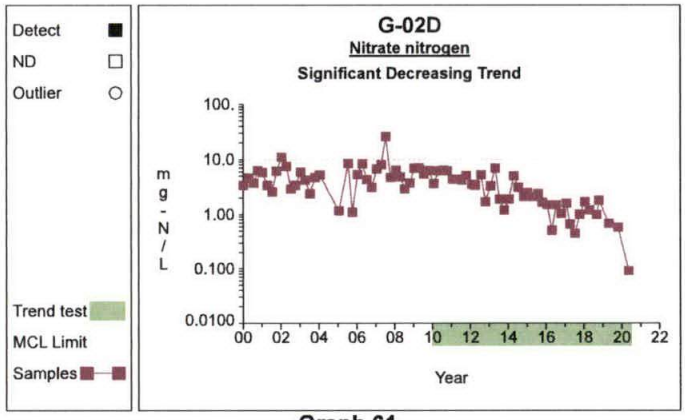


Graph 57

Prepared by: Snohomish County Solid Waste 8

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

Time Series

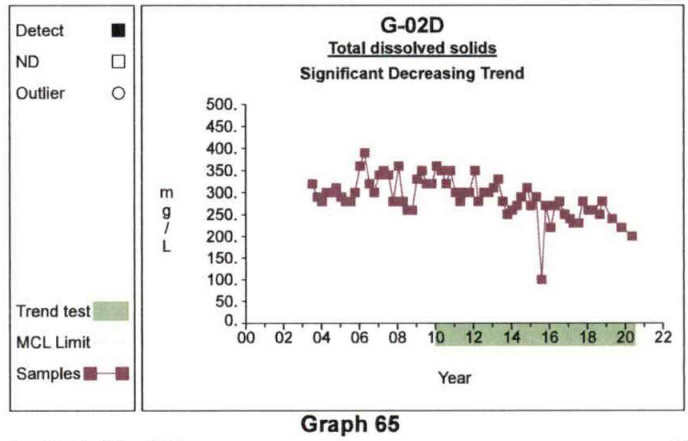


Graph 61

Prepared by: Snohomish County Solid Waste 9

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

Time Series

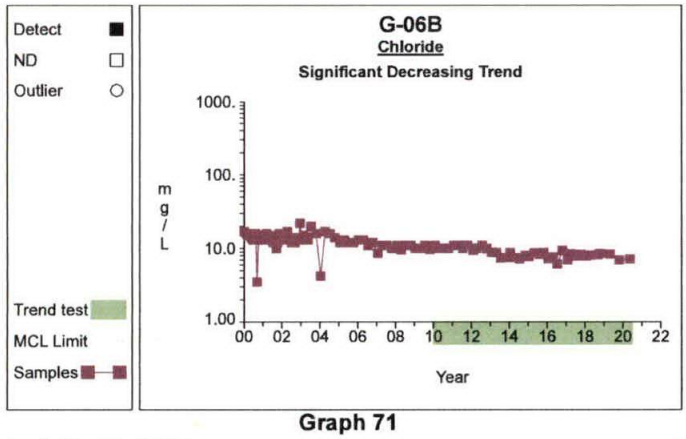


Graph 65

Prepared by: Snohomish County Solid Waste 10

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

Time Series

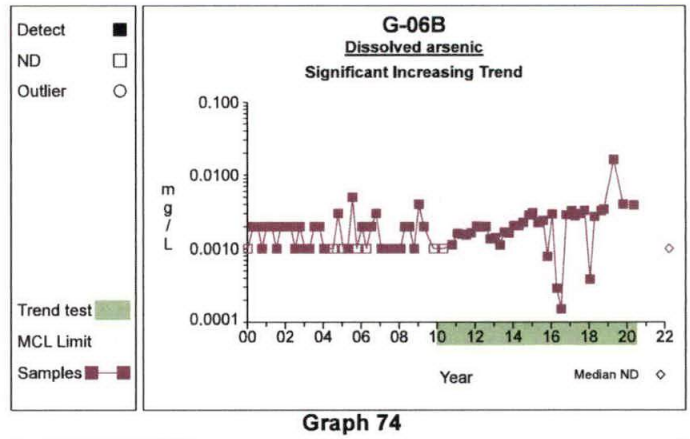


Graph 71

Prepared by: Snohomish County Solid Waste 11

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

Time Series

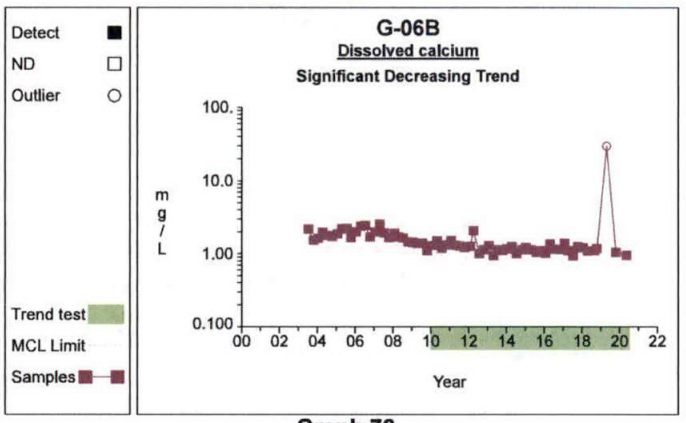


Graph 74

Prepared by: Snohomish County Solid Waste 12

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

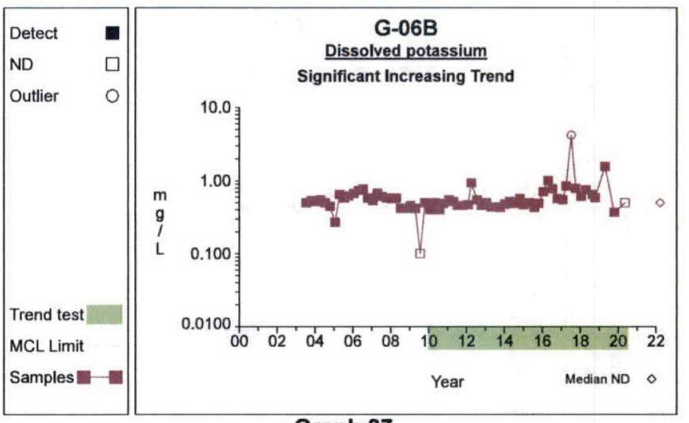
Time Series



Graph 78

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

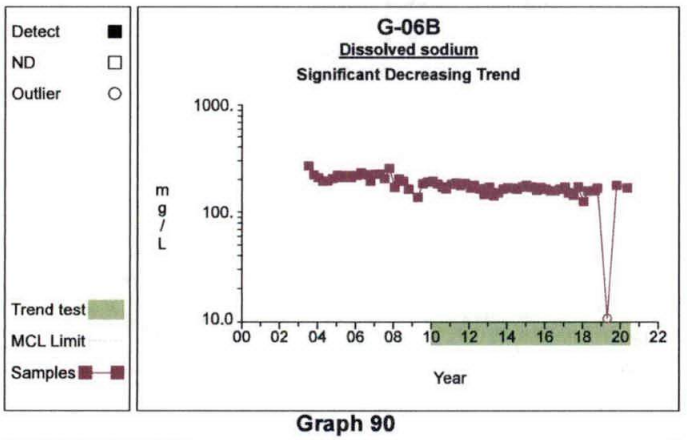
Time Series



Graph 87

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

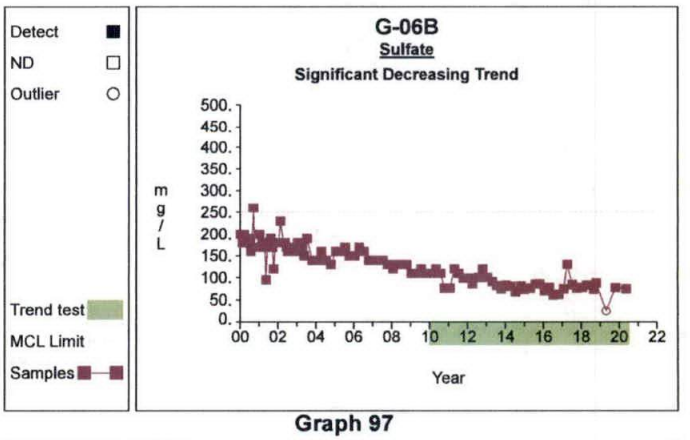
Time Series



Graph 90

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

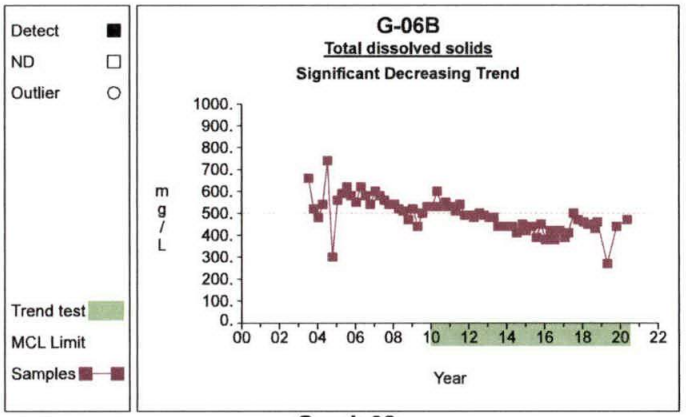
Time Series



Graph 97

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

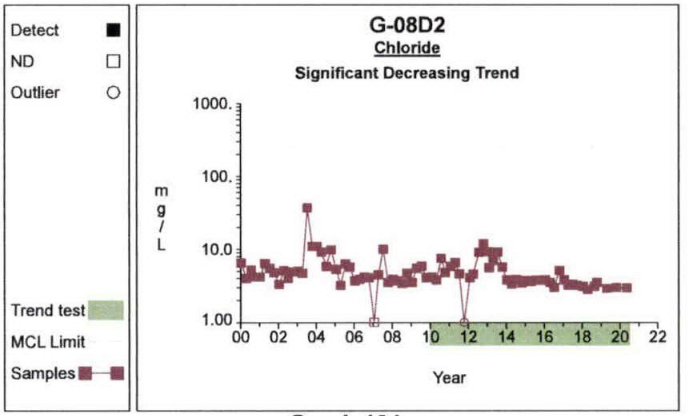
Time Series



Graph 98

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

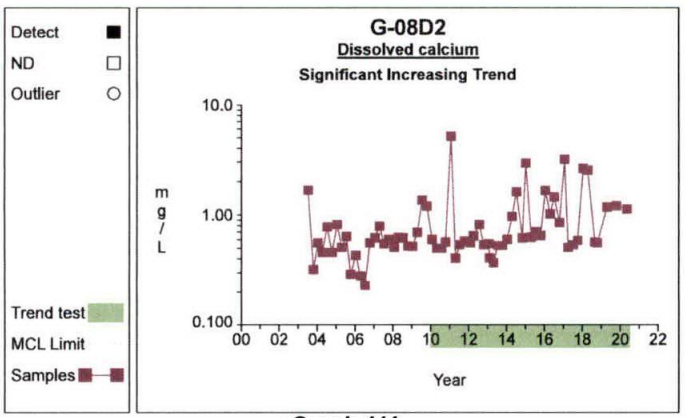
Time Series



Graph 104

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

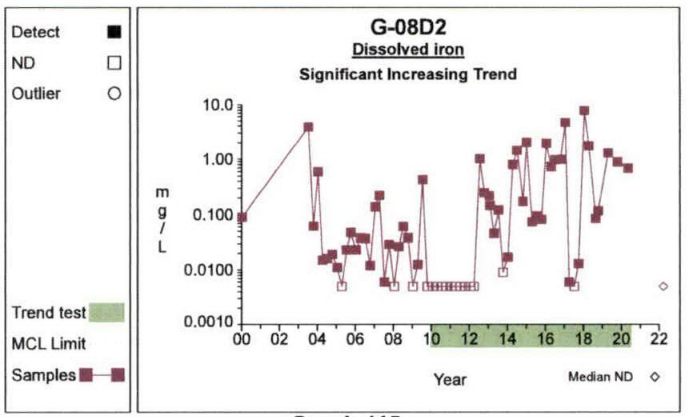
Time Series



Graph 111

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

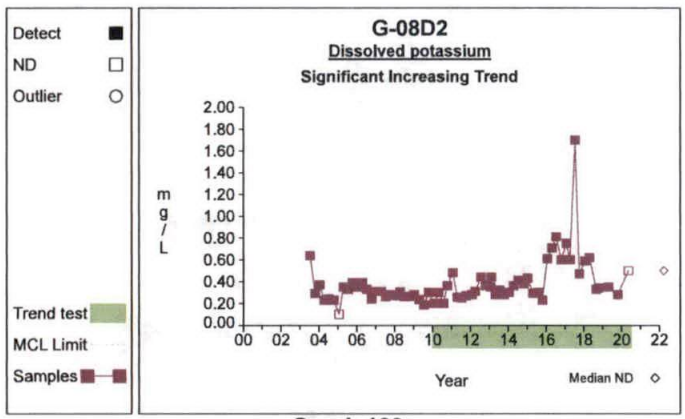
Time Series



Graph 115

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

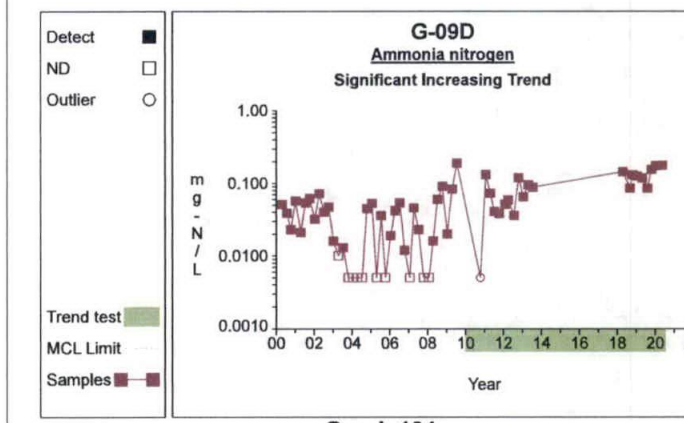
Time Series



Graph 120

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

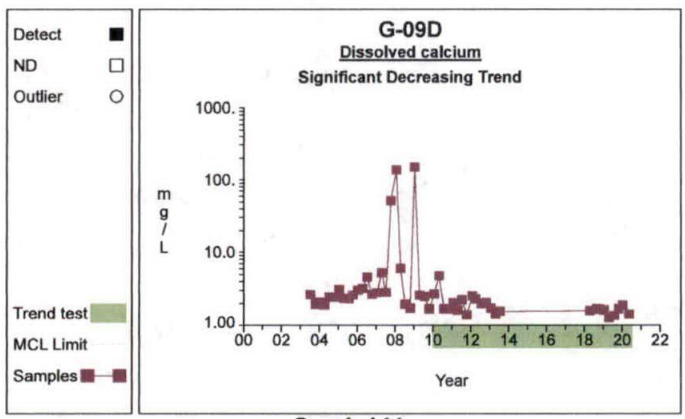
Time Series



Graph 134

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

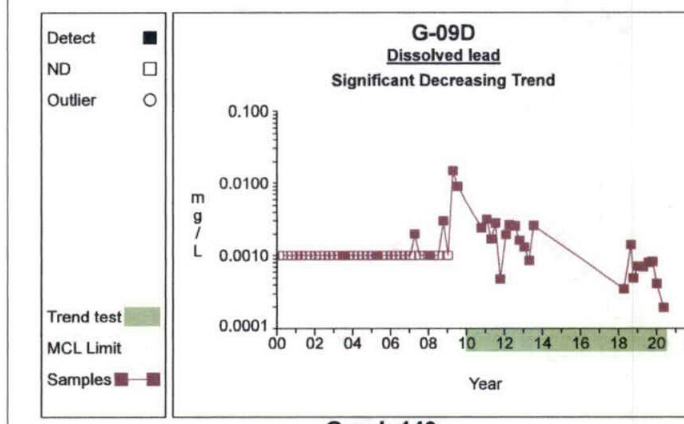
Time Series



Graph 144

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

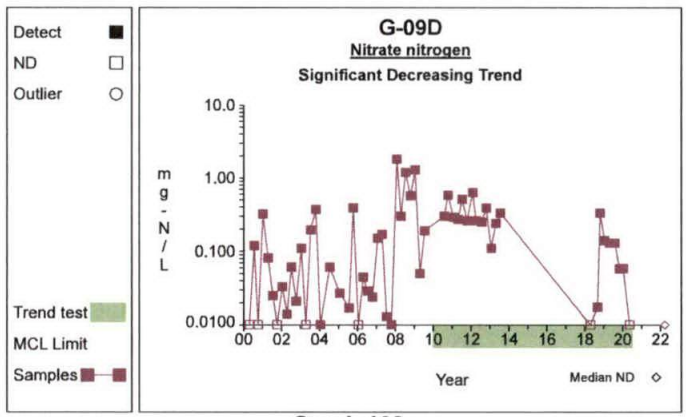
Time Series



Graph 149

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

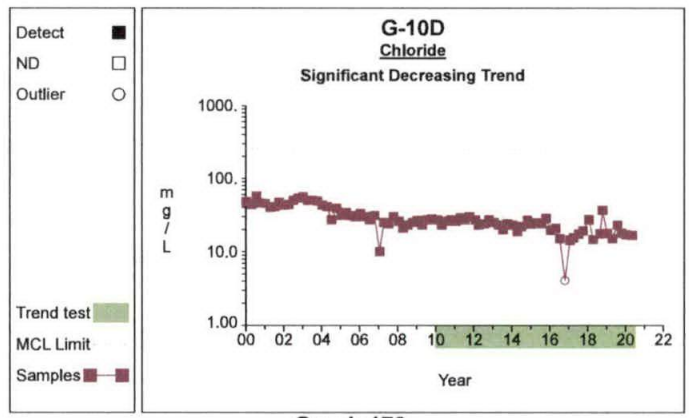
Time Series



Graph 160

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

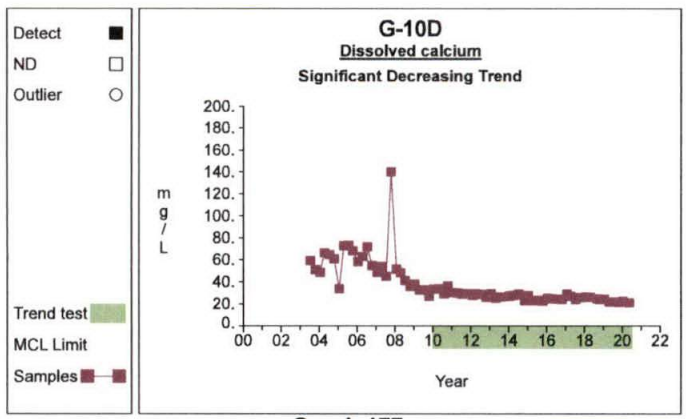
Time Series



Graph 170

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

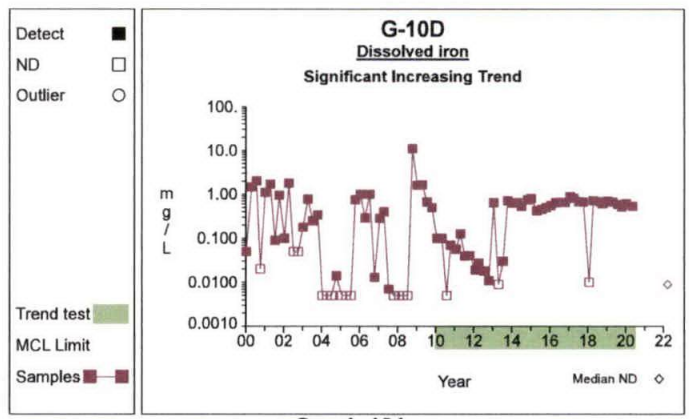
Time Series



Graph 177

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

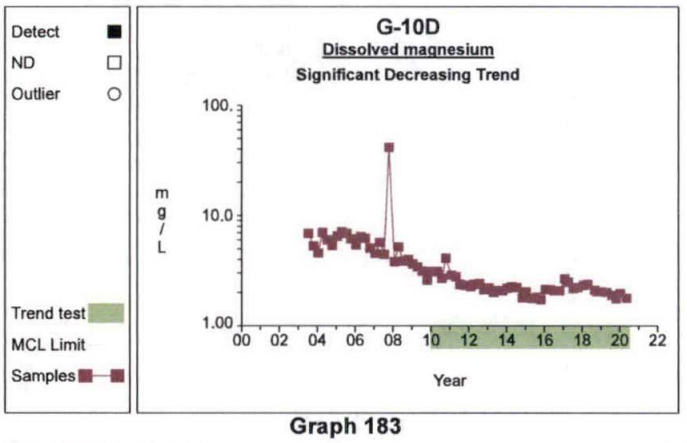
Time Series



Graph 181

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

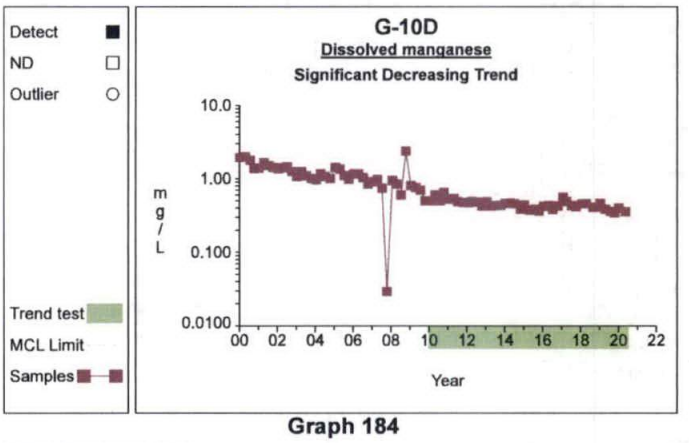
Time Series



Graph 183

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

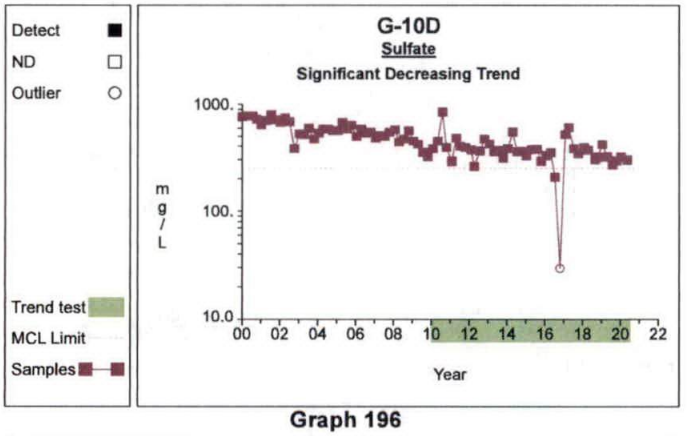
Time Series



Graph 184

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

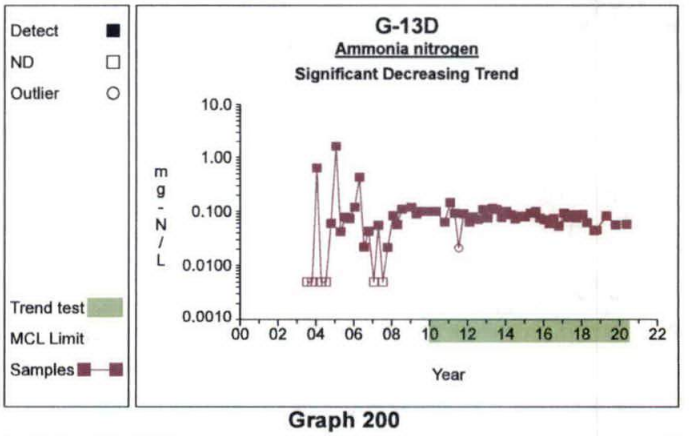
Time Series



Graph 196

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

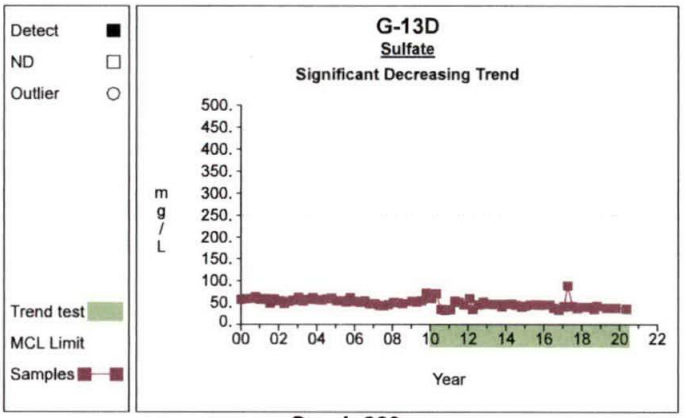
Time Series



Graph 200

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

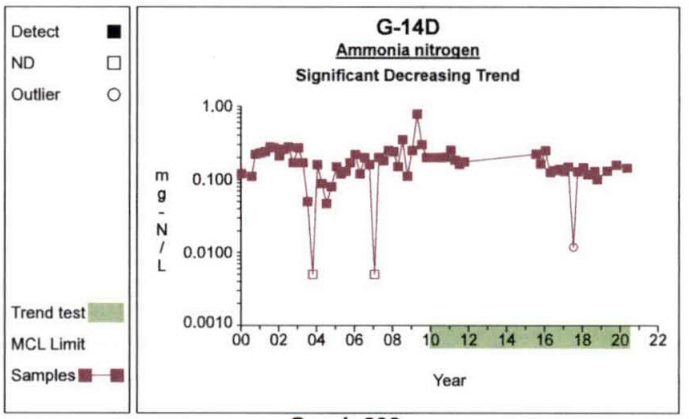
Time Series



Graph 229

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

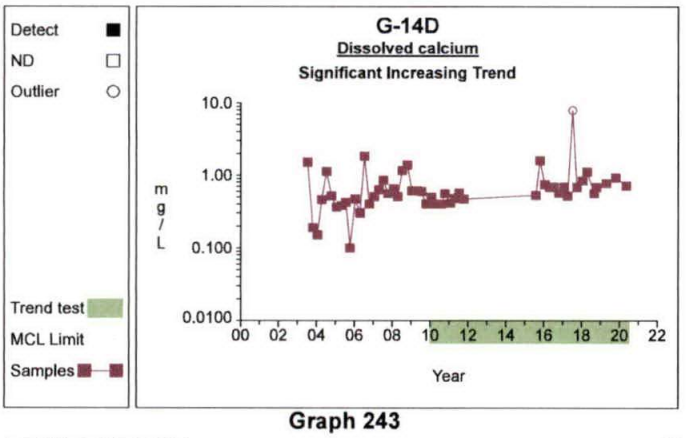
Time Series



Graph 233

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

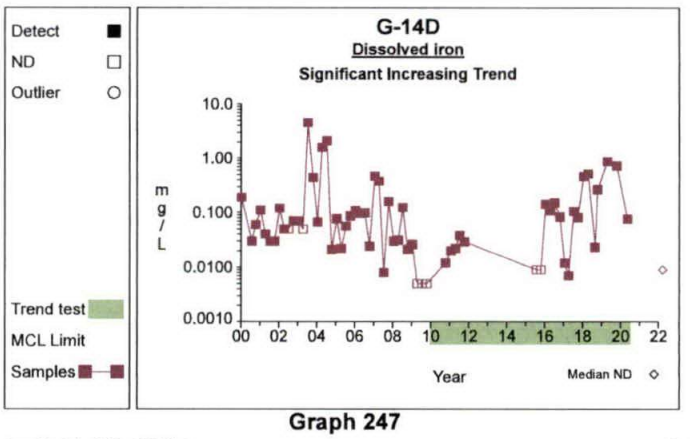
Time Series



Graph 243

Cathcart Landfill [CCDEEP] Analysis prepared on: 7/10/2020

Time Series

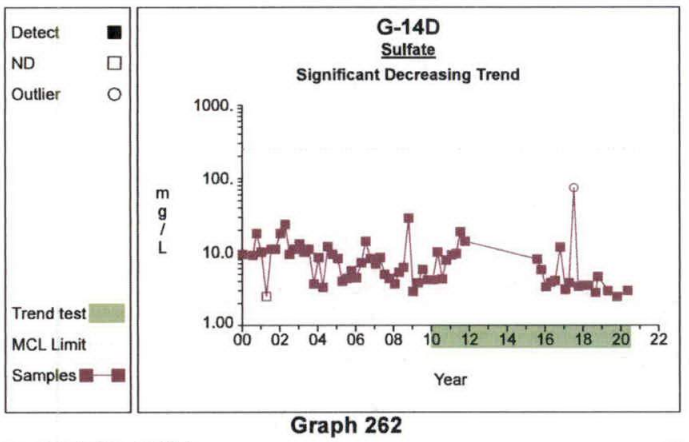


Graph 247

Cathcart Landfill [CCDEEP]

Analysis prepared on: 7/10/2020

Time Series

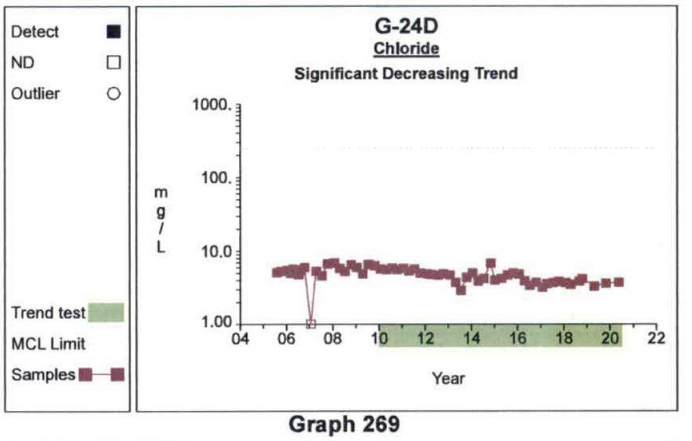


Graph 262

Cathcart Landfill [CCDEEP]

Analysis prepared on: 7/10/2020

Time Series

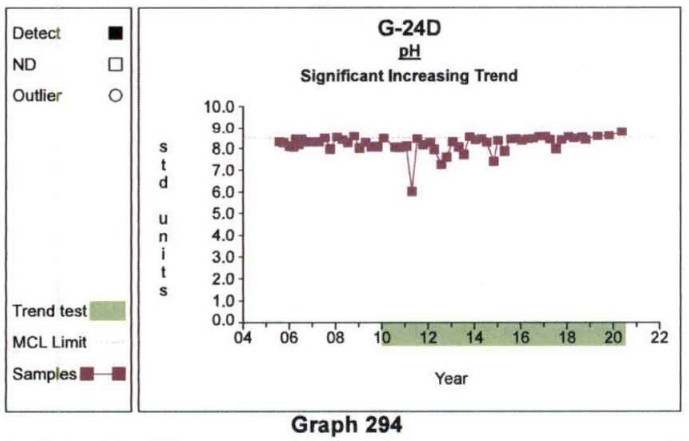


Graph 269

Cathcart Landfill [CCDEEP]

Analysis prepared on: 7/10/2020

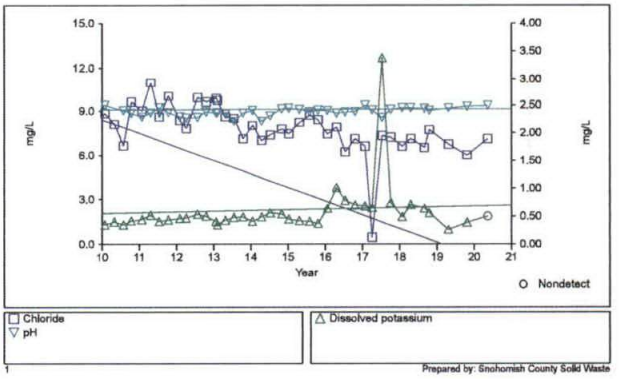
Time Series



Graph 294

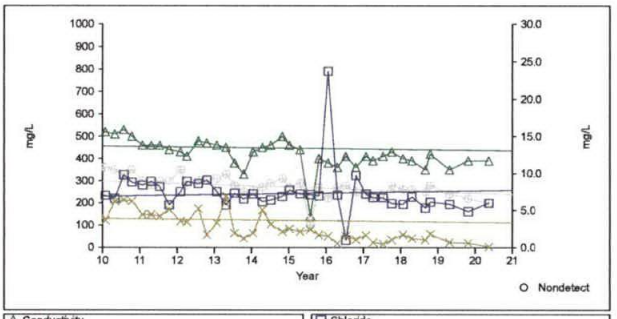
Cathcart Landfill

Time Series Plot for G-01D



Cathcart Landfill

Time Series Plot for G-02D



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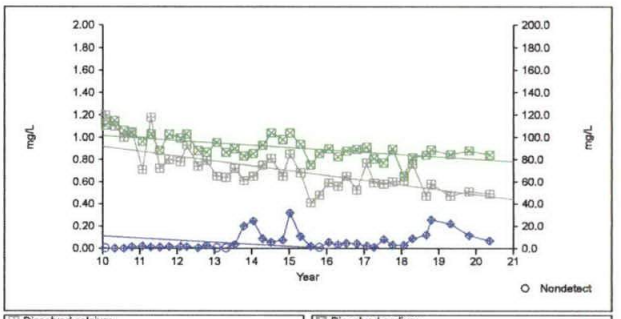
Cathcart Landfill

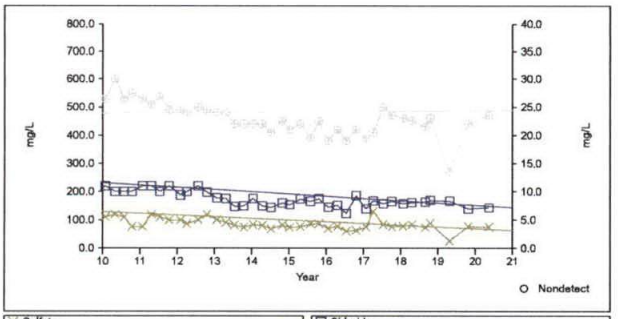
Time Series Plot for G-02D



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

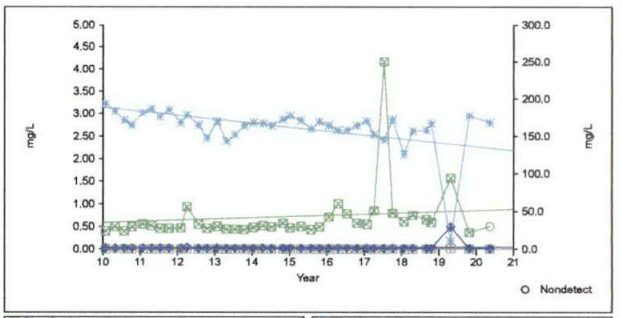
Time Series Plot for G-06B



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

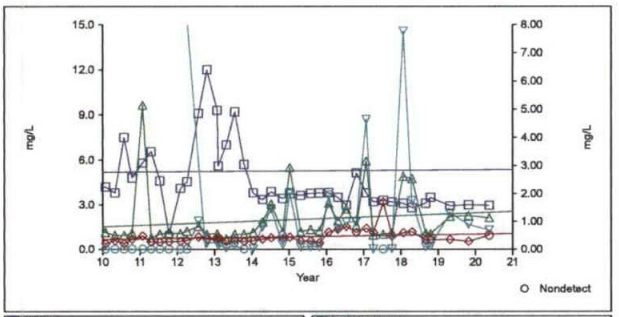
Time Series Plot for G-06B



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

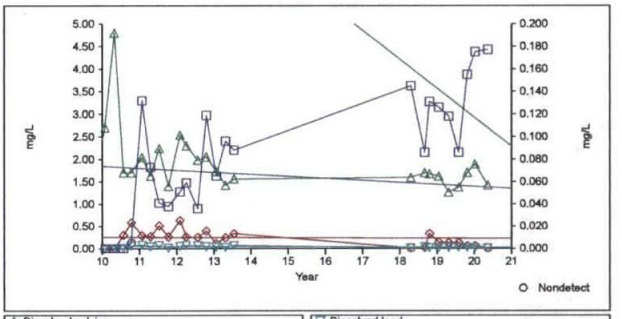
Time Series Plot for G-08D2



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

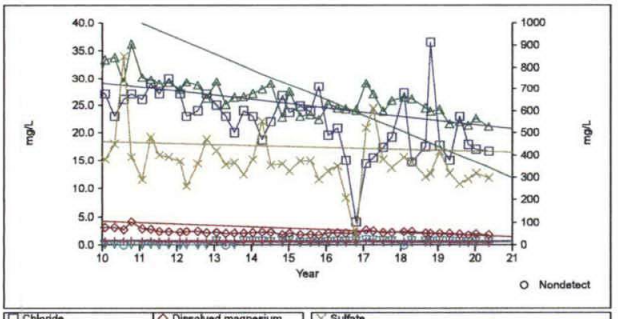
Time Series Plot for G-09D



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

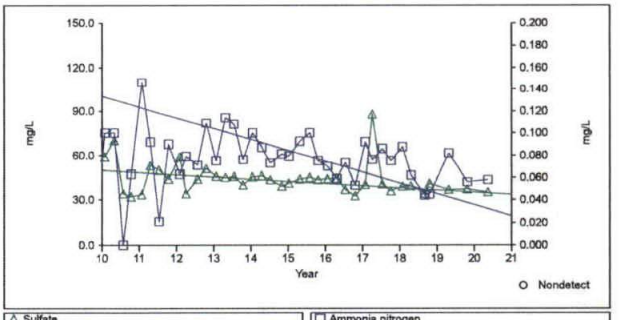
Time Series Plot for G-10D



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

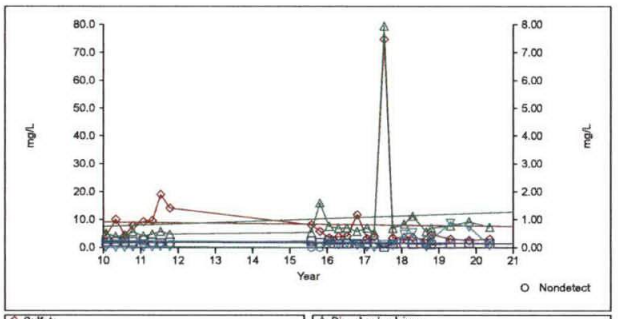
Time Series Plot for G-13D



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

Time Series Plot for G-14D



◇ Sulfate

△ Dissolved calcium
▽ Dissolved iron
□ Ammonia nitrogen

1

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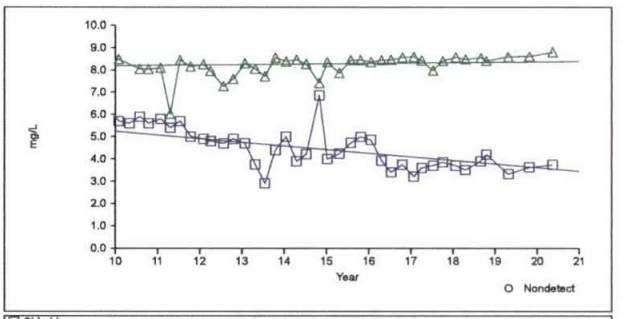
Cathcart Landfill

Time Series Plot for G-24D



□ Chloride
△ pH

1

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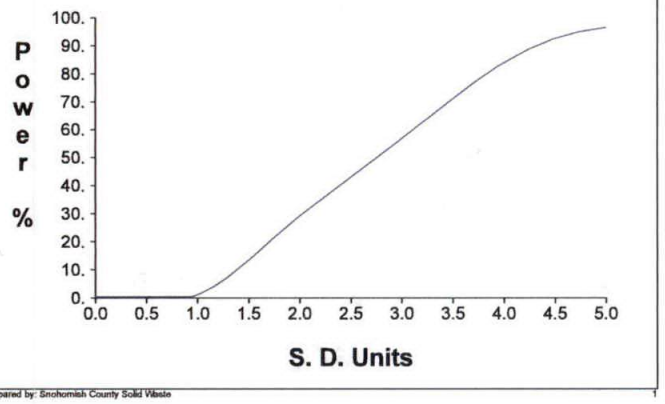
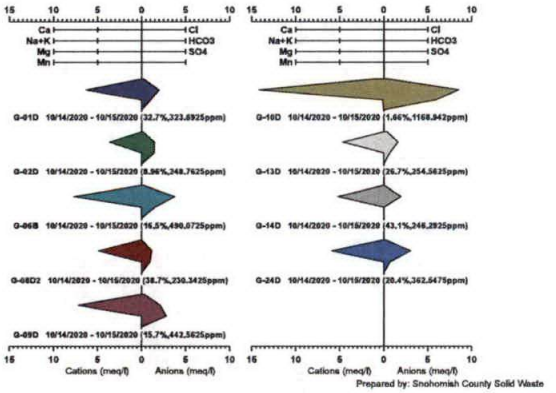
False Positive and False Negative Rates for Current Intra-Well Prediction Limits Monitoring Program

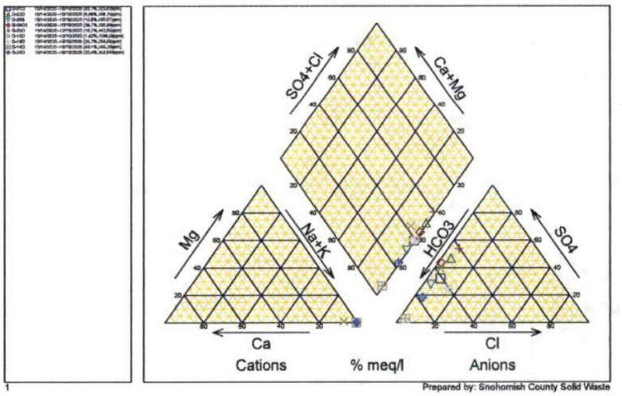


False Positive and False Negative Rates for Current Upgradient vs. Downgradient Monitoring Program

Cathcart Landfill

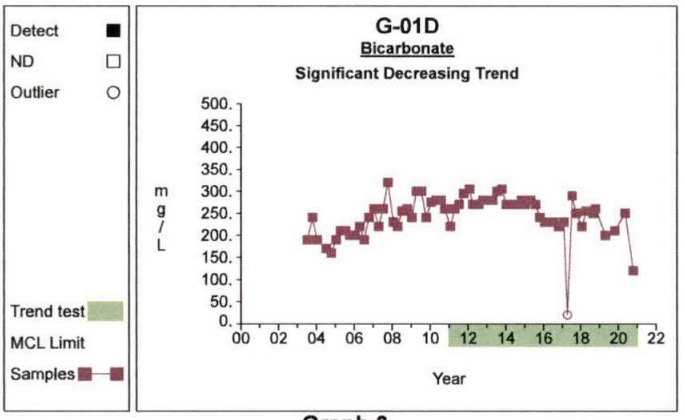


Cathcart Landfill



Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

Time Series

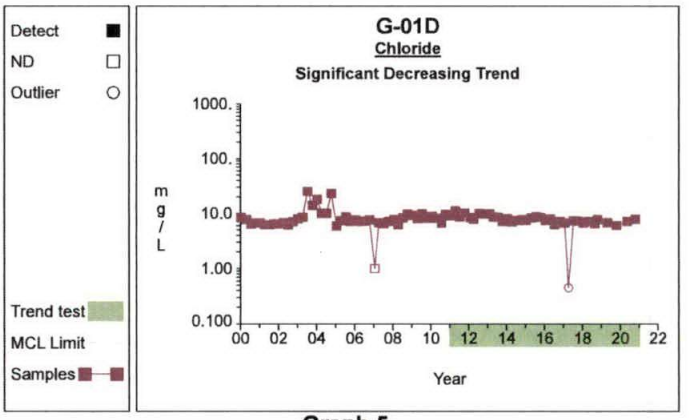


Graph 3

Prepared by: Snohomish County Solid Waste 1

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

Time Series

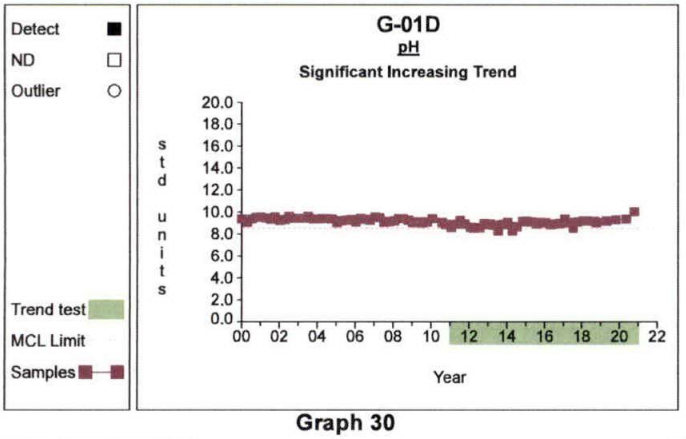


Graph 5

Prepared by: Snohomish County Solid Waste 2

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

Time Series

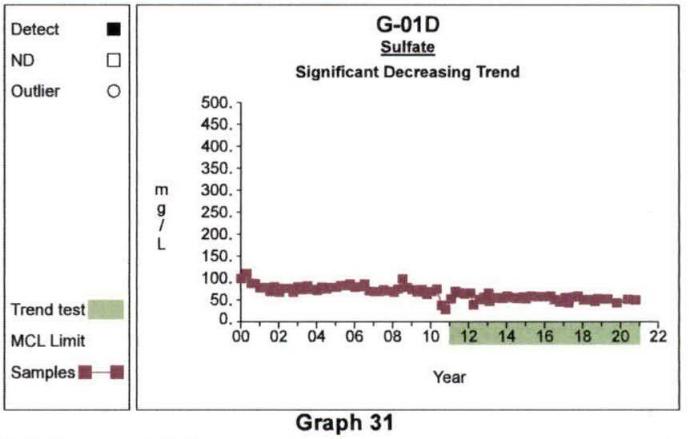


Graph 30

Prepared by: Snohomish County Solid Waste 3

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

Time Series

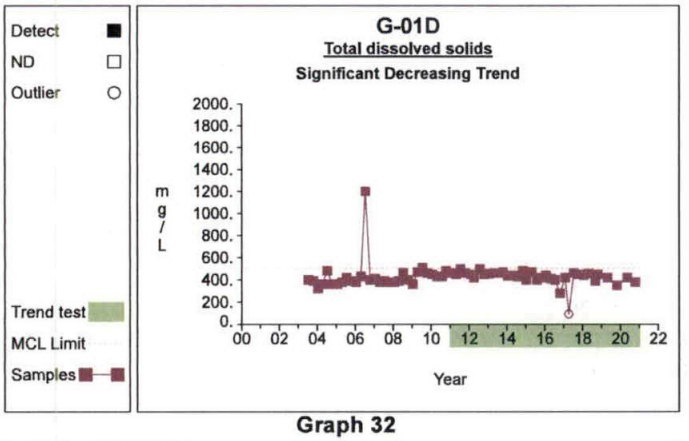


Graph 31

Prepared by: Snohomish County Solid Waste 4

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

Time Series

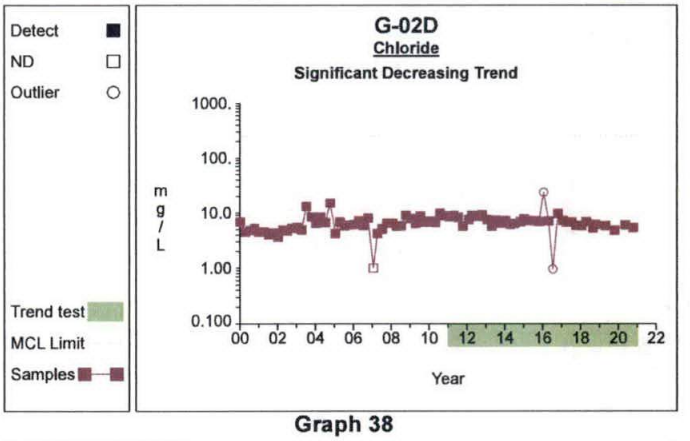


Graph 32

Prepared by: Snohomish County Solid Waste 5

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

Time Series

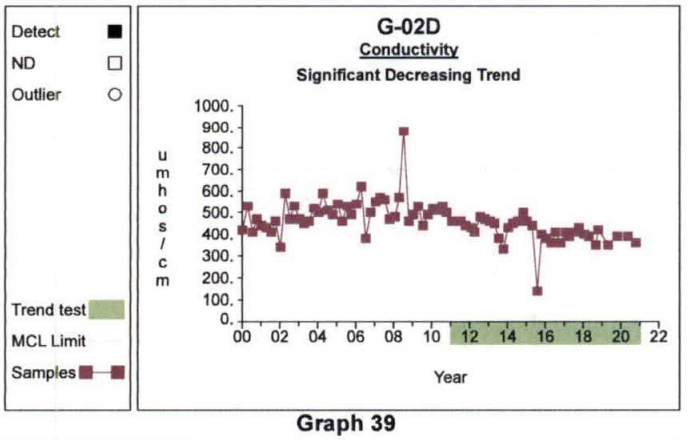


Graph 38

Prepared by: Snohomish County Solid Waste 6

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

Time Series

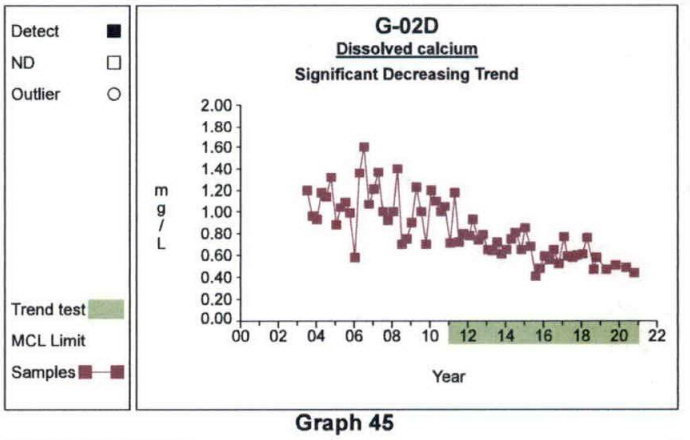


Graph 39

Prepared by: Snohomish County Solid Waste 7

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

Time Series

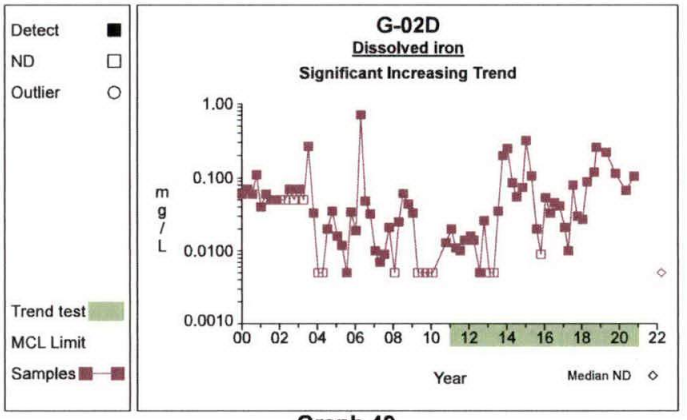


Graph 45

Prepared by: Snohomish County Solid Waste 8

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

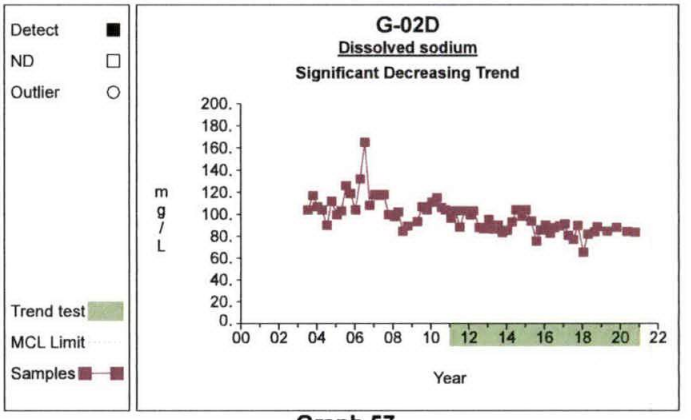
Time Series



Graph 49

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

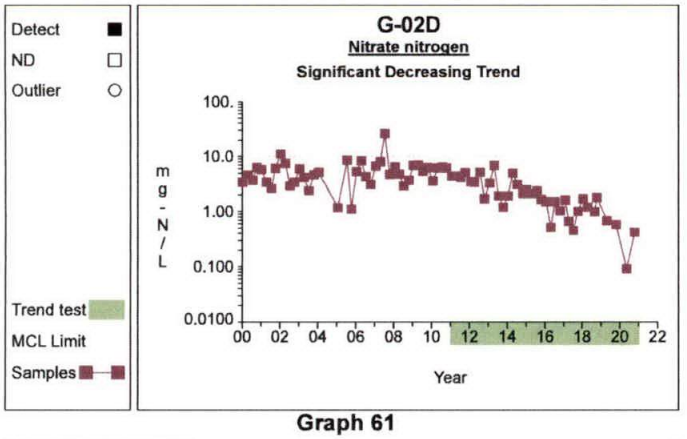
Time Series



Graph 57

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

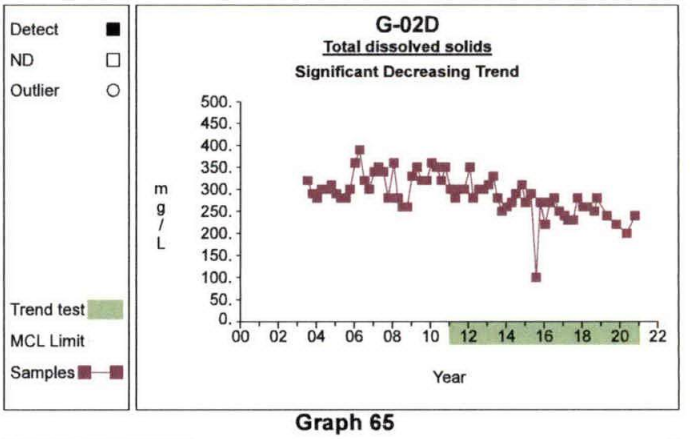
Time Series



Graph 61

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

Time Series

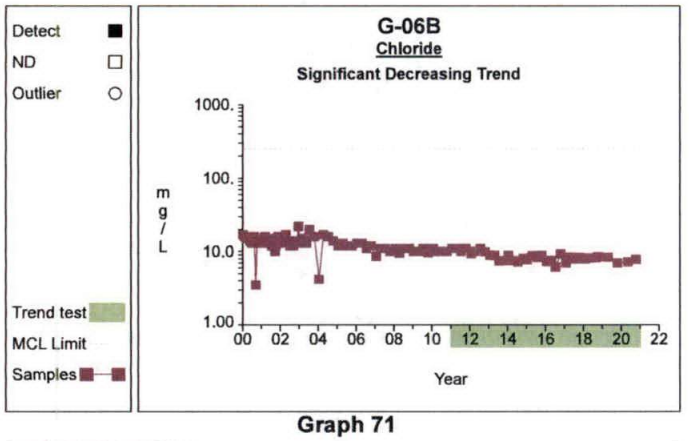


Graph 65

Cathcart Landfill [CCDEEP]

Analysis prepared on: 11/24/2020

Time Series

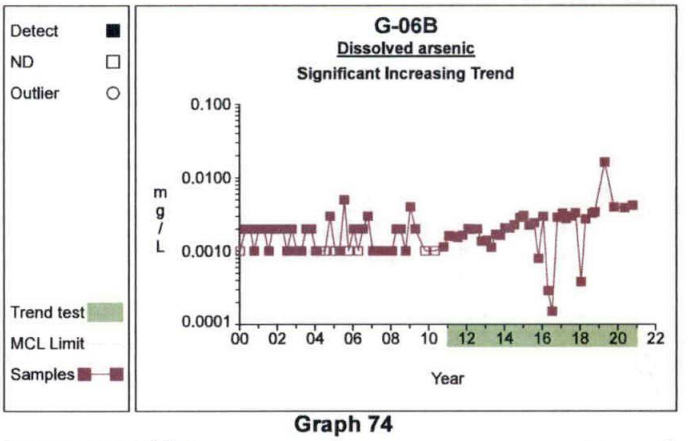


Graph 71

Cathcart Landfill [CCDEEP]

Analysis prepared on: 11/24/2020

Time Series

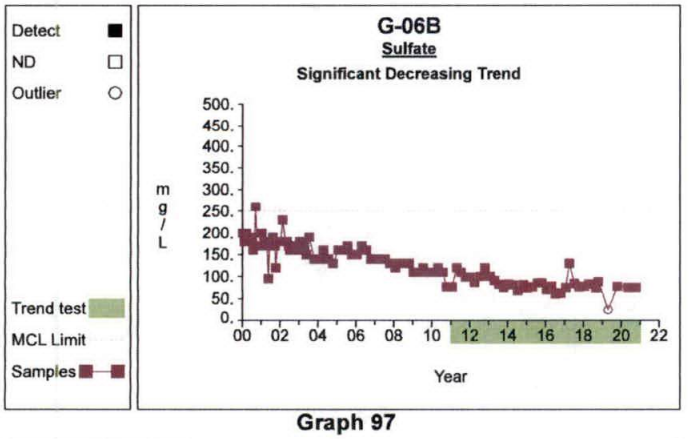


Graph 74

Cathcart Landfill [CCDEEP]

Analysis prepared on: 11/24/2020

Time Series

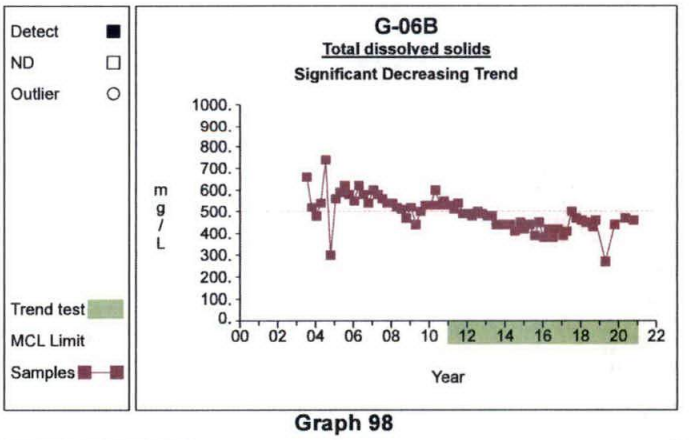


Graph 97

Cathcart Landfill [CCDEEP]

Analysis prepared on: 11/24/2020

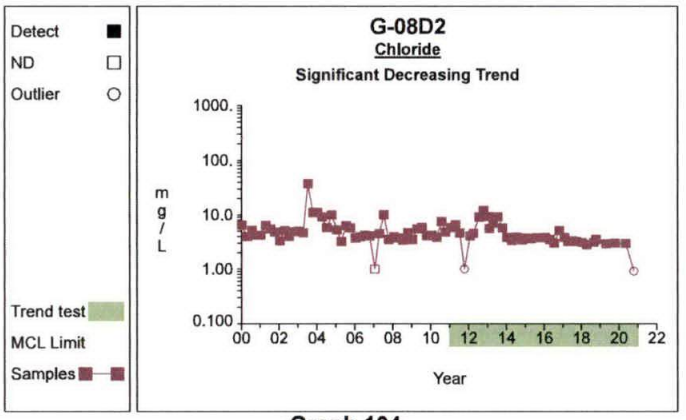
Time Series



Graph 98

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

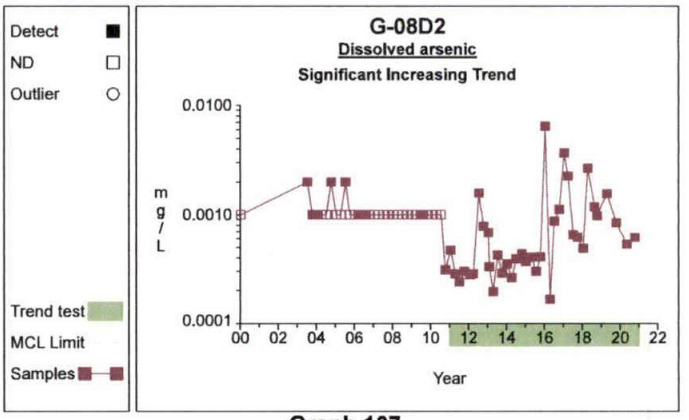
Time Series



Graph 104

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

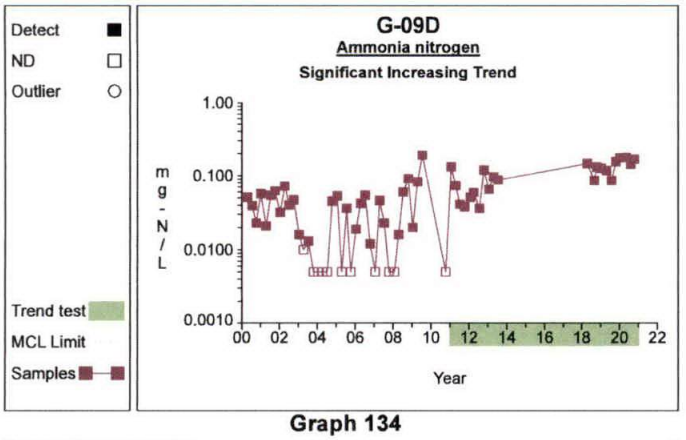
Time Series



Graph 107

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

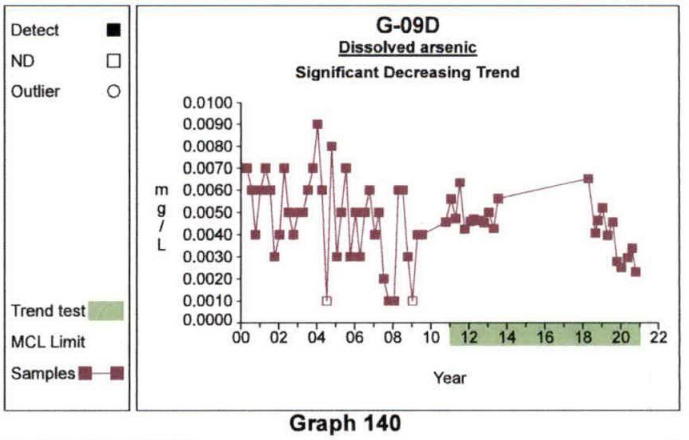
Time Series



Graph 134

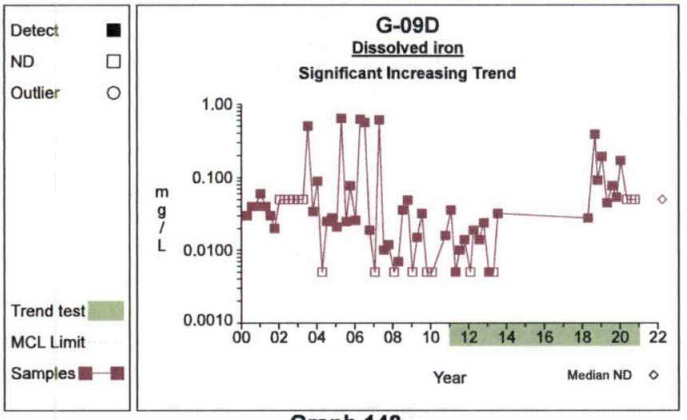
Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

Time Series



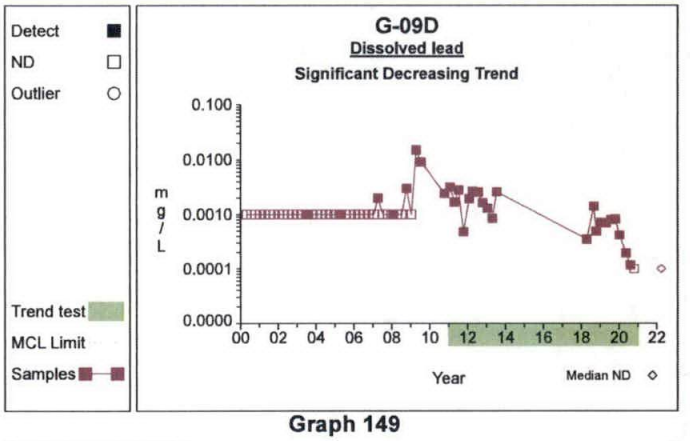
Graph 140

Time Series



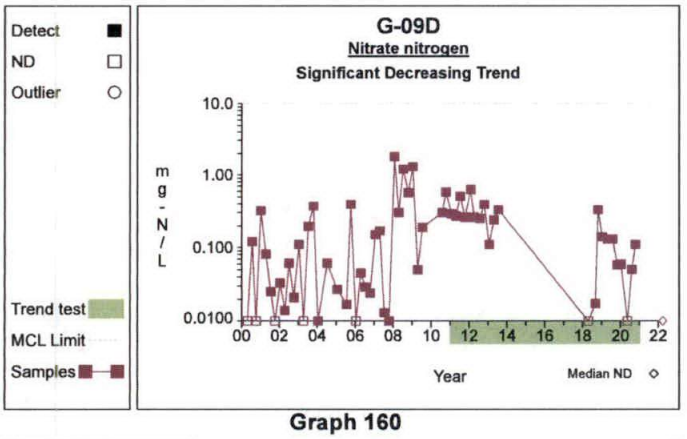
Graph 148

Time Series



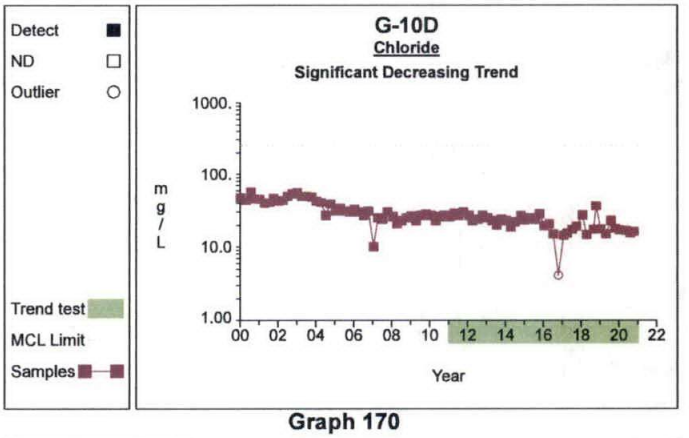
Graph 149

Time Series



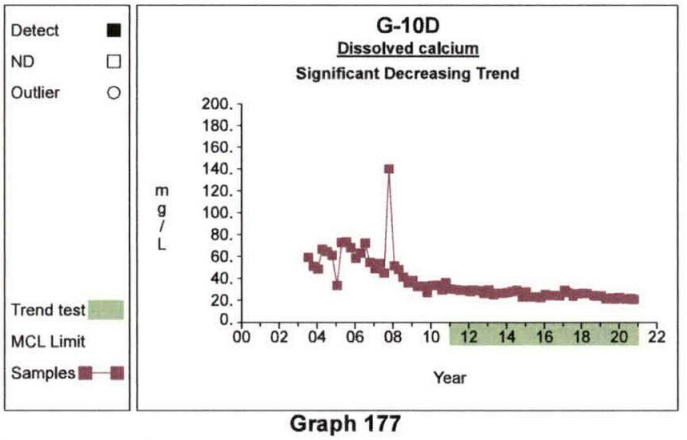
Graph 160

Time Series



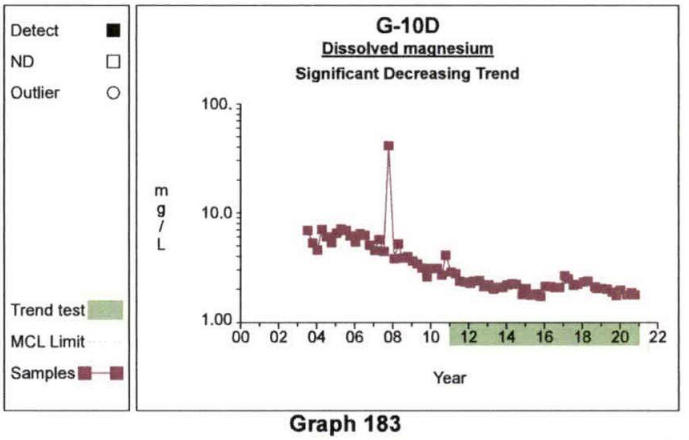
Graph 170

Time Series



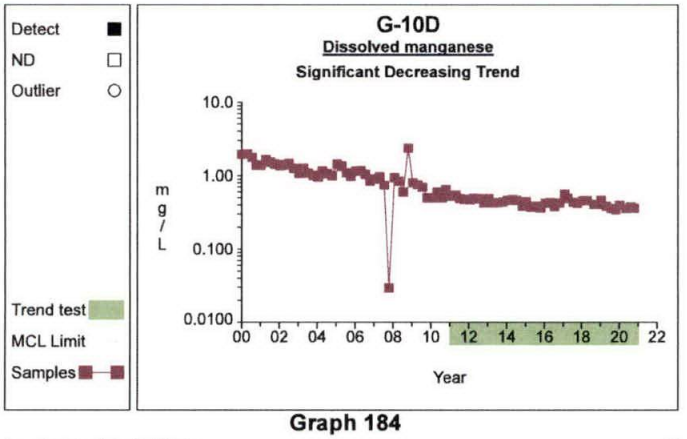
Graph 177

Time Series



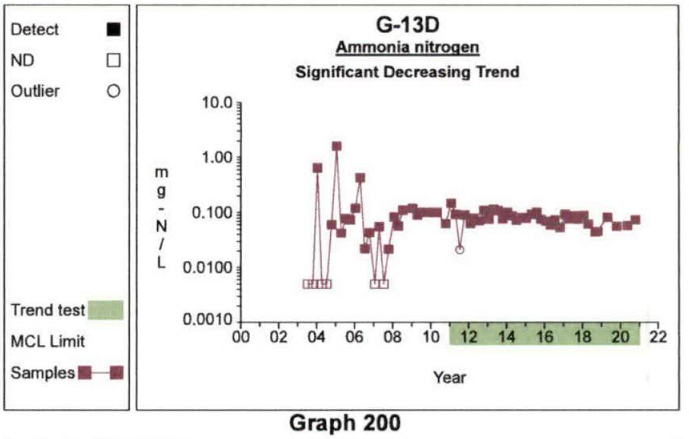
Graph 183

Time Series



Graph 184

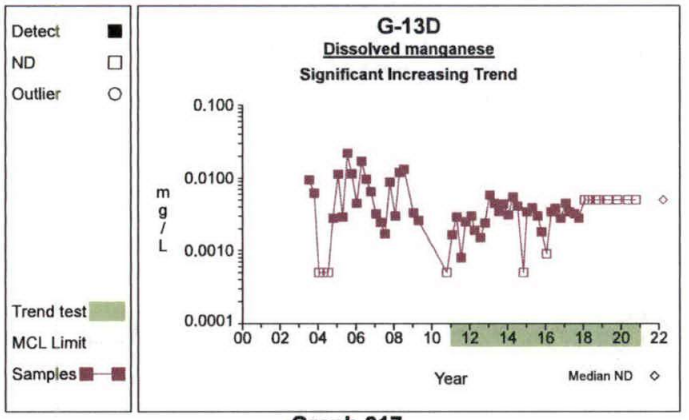
Time Series



Graph 200

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

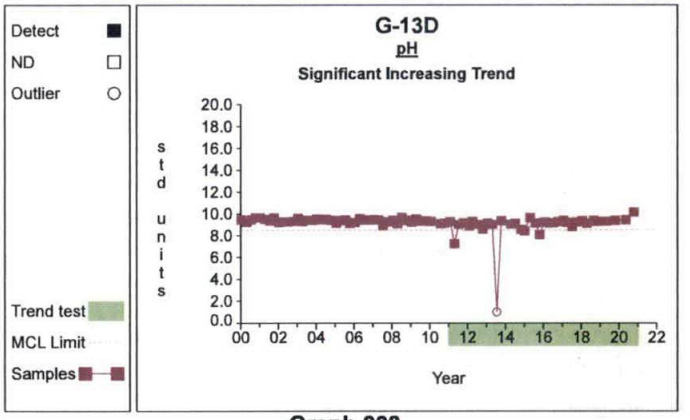
Time Series



Graph 217

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

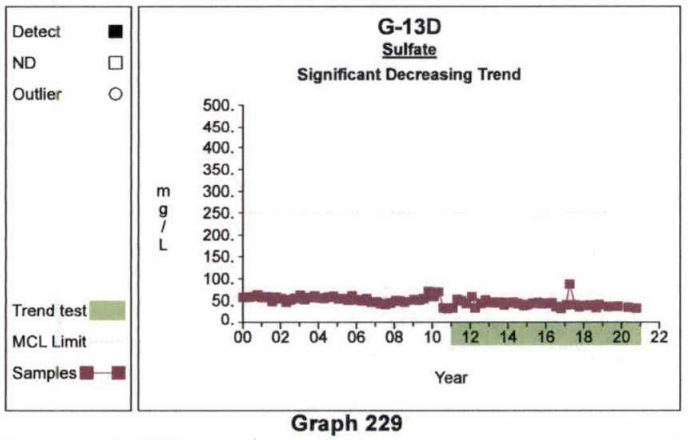
Time Series



Graph 228

Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

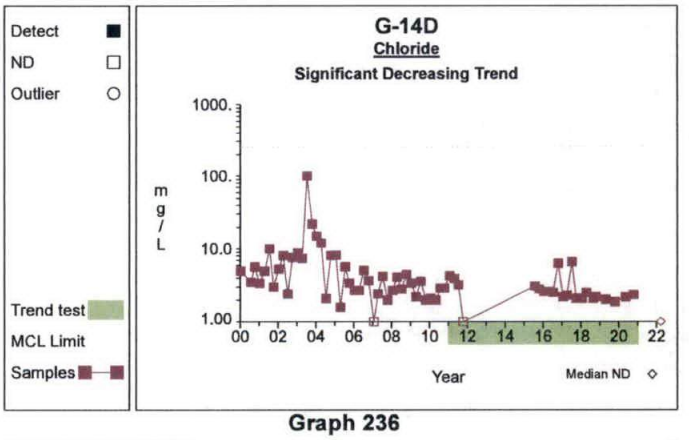
Time Series



Graph 229

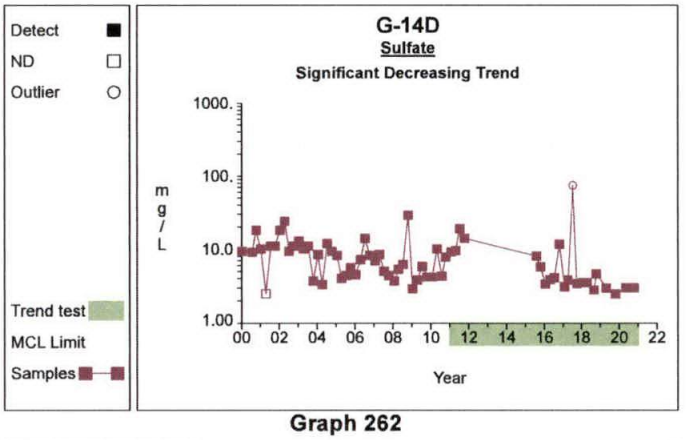
Cathcart Landfill [CCDEEP] Analysis prepared on: 11/24/2020

Time Series



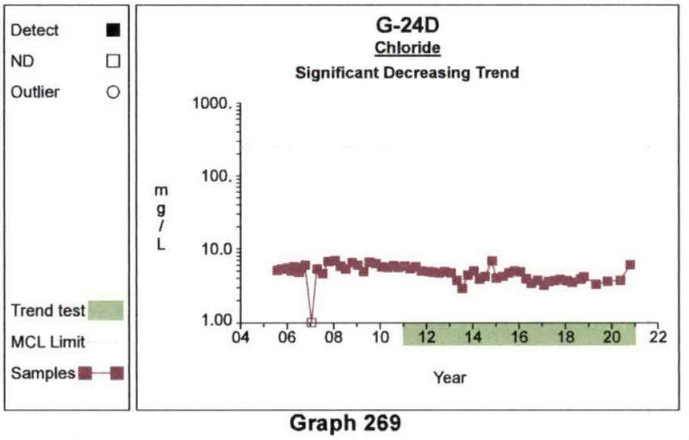
Graph 236

Time Series



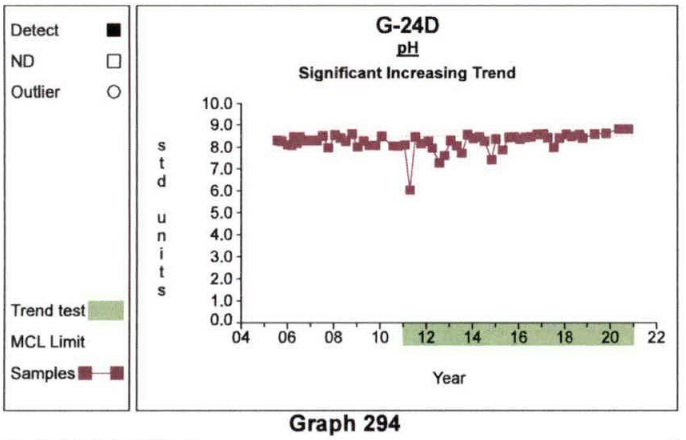
Graph 262

Time Series



Graph 269

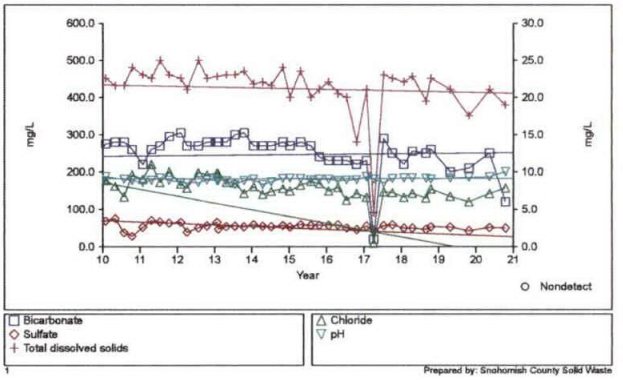
Time Series



Graph 294

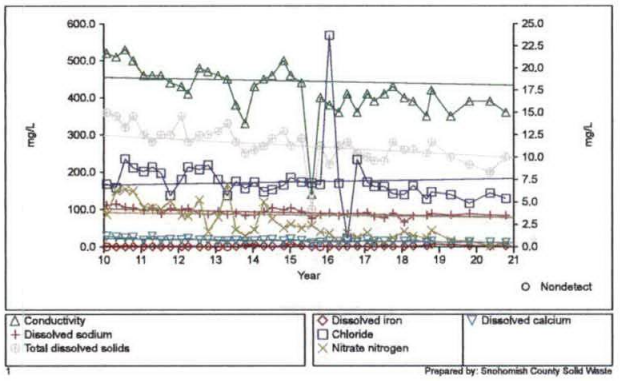
Cathcart Landfill

Time Series Plot for G-01D



Cathcart Landfill

Time Series Plot for G-02D



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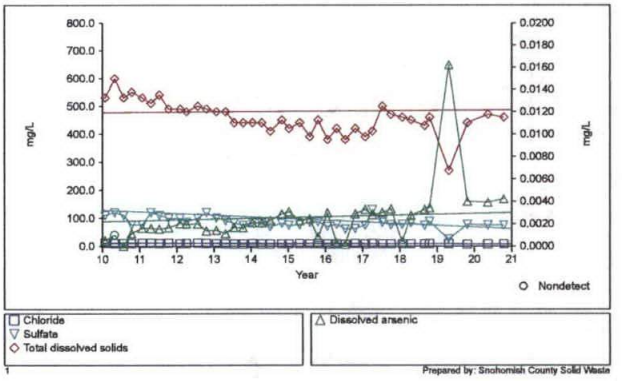
Cathcart Landfill

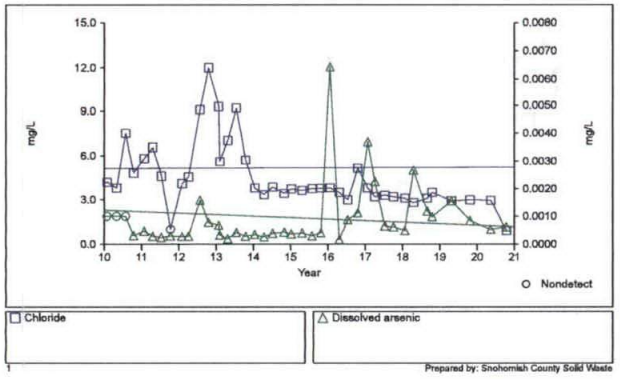
Time Series Plot for G-06B



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

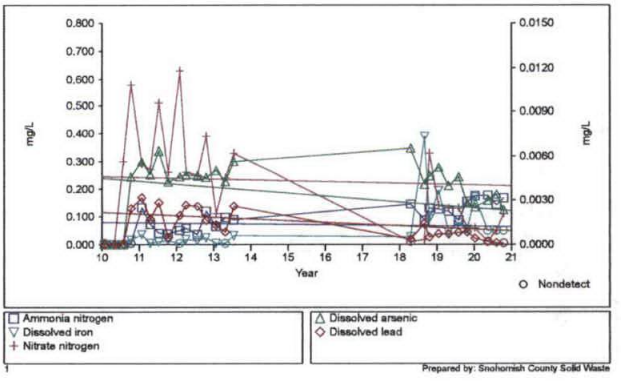
Time Series Plot for G-08D2



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

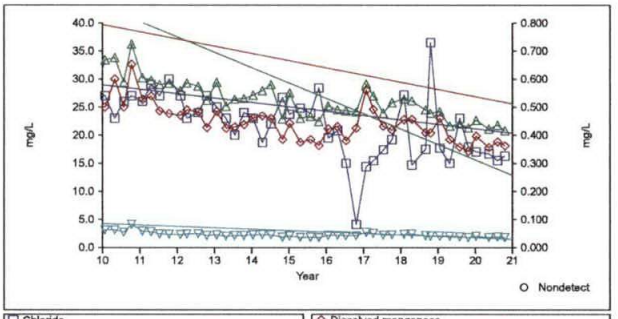
Time Series Plot for G-09D



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

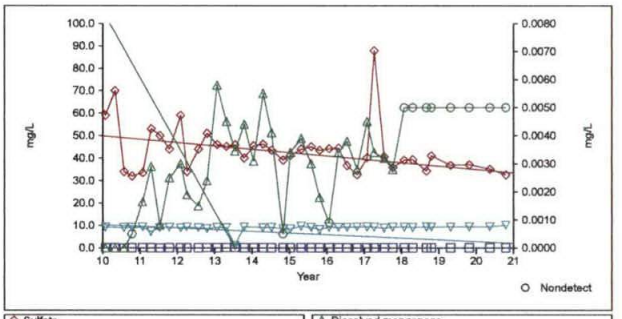
Time Series Plot for G-10D



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

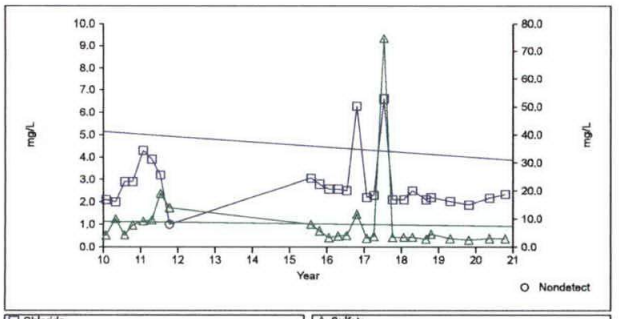
Time Series Plot for G-13D



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

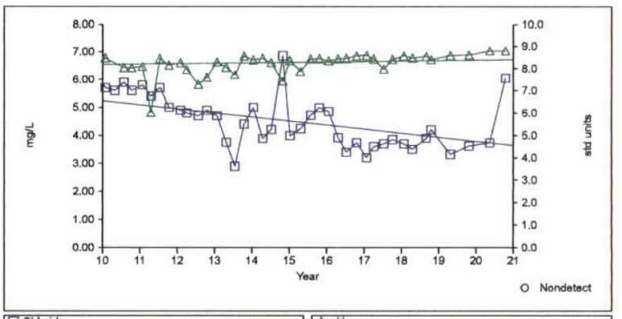
Time Series Plot for G-14D



Prepared by: Snohomish County Solid Waste

Cathcart Landfill

Time Series Plot for G-24D



Prepared by: Snohomish County Solid Waste

Appendix D

Field Monitoring Forms

- **Quarterly Landfill Gas Monitoring**
- **Monthly Vault Inspections**

Snohomish County Department of Public Works

Solid Waste Division

Gas Probe Monitoring Data

QUARTERLY GAS ROUND
DATE: 3-6-20

Site	Location: Probe	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Pressure	Comments
CATHCART	GP-4	1247	0	20	0			
	GP-5(1)	1254	0	19	2			
	GP-5(2)	1255	0	21	0			
	GP-1(1)	1304	0	21	0			
	GP-1(2)	1304	0	21	0			
	GP-2(1)	1306	0	3	5			
	GP-2(2)	1306	0	6	7			
	GP-3	1317	0	21	0			
	GP-6	1321	0	21	0			
	Main Man	1326	64	2	29	210		

Site	Location: Barhole	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Pressure	Comments
CATHCART	BH-3	1251	0	21	0			
	BH-4	1253	0	18	2			
	BH-5	1256	0	21	0			
	BH-6	1302	0	19	1			
	BH-7	1303	0	19	2			
	BH-8	1259	0	21	0			

Site	Location: Structure	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Pressure	Comments
CATHCART	SP-4	1308	0	21	0			
	C-FV-1	1309	0	21	0			
	C-COV-2	1309	0	21	0			
	C-VV-2	1310	0	21	0			
	SP-1	1311	1	20	6			
	C-VV-3	1312	0	21	1			
	Grit Chamber	1310	1	20	4			
	C-FV-2	1312	0	21	0			
	C-VV-5	1315	0	21	0			

Methane/Oxygen Meter Used =	GEM 5000
Barometer =	29.58
Technician Name =	SW, ML, TA
Page =	2 of 2

Snohomish County Department of Public Works
Solid Waste Division
Gas Probe Monitoring Data

QUARTERLY GAS ROUND
DATE: 6-19-20

Site	Location: Probe	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Pressure	Comments
CATHCART	GP-4	1110	0	21	0		29.55	
	GP-5(1)	1115	0	21	0		↓	
	GP-5(2)	1115	0	21	0			
	GP-1(1)	1133	0	21	0			
	GP-1(2)	1133	0	21	0			
	GP-2(1)	1137	0	17	3			
	GP-2(2)	1137	0	11	5			
	GP-3	1148	0	21	0			
	GP-6	1146	0	21	0			
	Main Man	1500	46	4	18	583	↓	
Site	**Location: Barhole**	**Time (Military)**	**Methane (% VOL)**	**Oxygen (% VOL, % LEL, PPM)**	**Carbon Diox. (% VOL)**	**Velocity**	**Pressure**	**Comments**
CATHCART	BH-3	1108	0	21	0		29.55	
	BH-4	1117	0	13	6		↓	
	BH-5	1123	0	21	0			
	BH-6	1129	0	21	0			
	BH-7	1133	0	19	2			
	BH-8	1135	0	20	1		↓	
Site	**Location: Structure**	**Time (Military)**	**Methane (% VOL)**	**Oxygen (% VOL, % LEL, PPM)**	**Carbon Diox. (% VOL)**	**Velocity**	**Pressure**	**Comments**
CATHCART	SP-4	1140	0	21	0		29.55	
	C-FV-1	1140	0	21	0		↓	
	C-COV-2	1141	0	21	0			
	C-VV-2	1141	0	21	0			
	SP-1	1141	0	21	0			
	C-VV-3	1142	0	21	0			
	Grit Chamber	1142	0	21	0			
	C-FV-2	1142	0	21	0			
	C-VV-5	1143	0	21	0		↓	

Methane/Oxygen Meter Used =	GEM 5000
Barometer =	~~GE~~ THERMO SCI
Technician Name =	ML
Page =	2 of 2

Snohomish County Department of Public Works

Solid Waste Division

Gas Probe Monitoring Data

QUARTERLY GAS ROUND
DATE: 9/23/20

Site	Location: Probe	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Pressure	Comments
CATHCART	GP-4	1317	0	21	0		29.41	
	GP-5(1)	1321	0	21	0			
	GP-5(2)	1322	0	21	0			
	GP-1(1)	1335	0	21	0			
	GP-1(2)	1336	0	21	0			
	GP-2(1)	1328	0	21	0			
	GP-2(2)	1329	0	21	0			
	GP-3	1305	0	21	0			
	Main Man	1345	30	6	21	567		

Site	Location: Barhole	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Pressure	Comments
CATHCART	BH-3	1314	0	21	0		29.41	
	BH-4	1316	0	20	1			
	BH-5	1323	0	21	0			
	BH-6	1324	0	21	0			
	BH-7	1325	0	20	2			
	BH-8	1329	0	21	0			

Site	Location: Structure	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Pressure	Comments
CATHCART	SP-4	1336	0	21	0		29.41	
	C-FV-1	1337	0	21	0			
	C-COV-2	1338	0	21	0			
	C-VV-2	1339	0	21	0			
	SP-1	1340	0	21	2			
	C-VV-3	1341	0	21	0			
	Grit Chamber	1342	0	21	0			
	C-FV-2	1343	0	21	0			
	C-VV-5	1344	0	21	0			

Methane/Oxygen Meter Used =	GEM 5000
Barometer =	29.41
Technician Name =	SW/ML
Page =	2 of 2

Snohomish County Department of Public Works
Solid Waste Division
Gas Probe Monitoring Data

QUARTERLY GAS ROUND
DATE: 12/18/20

Site	Location: Probe	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Pressure	Comments
CATHCART	GP-4	1240	0%	20%	1%		29.68	
	GP-5(1)	1250	0%	17%	4%		"	
	GP-5(2)	1250	0%	20%	0%		"	
	GP-1(1)	1317	0%	21%	0%		"	
	GP-1(2)	1317	0%	21%	0%		"	
	GP-2(1)	1322	0%	5%	7%		"	
	GP-2(2)	1322	0%	8%	7%		"	
	GP-3	1335	0%	21%	1%		"	
	GP-6	1333	0%	21%	0%		"	
	Main Man	1445	31%	2%	21%	422	"	
Site	**Location: Barhole**	**Time (Military)**	**Methane (% VOL)**	**Oxygen (% VOL, % LEL, PPM)**	**Carbon Diox. (% VOL)**	**Velocity**	**Pressure**	**Comments**
CATHCART	BH-3	1245	0%	20%	1%		29.68	
	BH-4	1252	0%	19%	2%		"	
	BH-5	1255	0%	21%	0%		"	
	BH-6	1300	0%	19%	1%		"	
	BH-7	1318	0%	21%	0%		"	
	BH-8	1305	0%	20%	1%		"	
Site	**Location: Structure**	**Time (Military)**	**Methane (% VOL)**	**Oxygen (% VOL, % LEL, PPM)**	**Carbon Diox. (% VOL)**	**Velocity**	**Pressure**	**Comments**
CATHCART	SP-4	1325	0%	21%	0%		29.68	
	C-FV-1`	1326	0%	21%	0%		"	
	C-COV-2	1326	0%	21%	0%		"	
	C-VV-2	1326	0%	21%	0%		"	
	SP-1	1327	0%	21%	0%		"	
	C-VV-3	1327	0%	21%	0%		"	
	Grit Chamber	1327	0%	21%	0%		"	
	C-FV-2	1328	0%	21%	0%		"	
	C-VV-5	1328	0%	21%	0%		"	

Methane/Oxygen Meter Used =	GEM 5000
Barometer =	29.68
Technician Name =	ML
Page =	**2 of 2**

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: January 31, 2020 **INSPECTOR(S):** ML - TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION:		SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
			ODORS	DEFECTS			
FD-1	FIRE DEPARTMENT	—	—	—	—	—	UNABLE TO LOCATE
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	-------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	—	-------	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~12"	NO	NONE	—	-------	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	-------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	-------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	-------	
P-VV-9	VALVE VAULT	30"	NO	YES	—	-------	Leaky Gasket
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: February 20, 2020 **INSPECTOR(S):** ML - TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION: ODORS	CONDITION: DEFECTS	SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
FD-1	Flow Distribution	144"	—	—	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	NO	Requested work order
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~12"	NO	NONE	—	------	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-9	VALVE VAULT	0"	NO	YES	—	------	Leaky Gasket - Request work order
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

P-VV-9 Vactored on 2-21-20

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: March 31, 2020 **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION:		SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
			ODORS	DEFECTS			
FD-1	Flow Distribution	144"	—	—	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~12"	NO	NONE	—	------	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-9	VALVE VAULT	4"	NO	YES	—	------	Leaky Gasket - Request work order
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: April 21, 2020 | **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION:		SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
			ODORS	DEFECTS			
FD-1	Flow Distribution	144"	—	—	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~12"	NO	NONE	—	------	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-9	VALVE VAULT	4"	NO	YES	—	------	
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: May 5, 2020 **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION:		SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
			ODORS	DEFECTS			
FD-1	Flow Distribution	144"	—	—	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	———	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~12"	NO	NONE	—	———	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	———	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	———	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	———	
P-VV-9	VALVE VAULT	4"	NO	YES	—	———	
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: June 30, 2020			INSPECTOR(S): TA				
LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION: ODORS	CONDITION: DEFECTS	SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
FD-1	Flow Distribution	144"	No	NONE	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	—	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~12"	NO	NONE	—	—	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	—	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	—	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	—	
P-VV-9	VALVE VAULT	10"	NO	YES	—	—	
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: July 14, 2020 **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION: ODORS	CONDITION: DEFECTS	SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
FD-1	Flow Distribution	0"	No	NONE	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	-------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	—	-------	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	-------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	-------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	-------	
P-VV-9	VALVE VAULT	10"	NO	YES	—	-------	
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: August 25, 2020			INSPECTOR(S): ML				
LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION: ODORS	CONDITION: DEFECTS	SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
FD-1	Flow Distribution	0"	No	NONE	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	—	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	—	—	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	—	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	—	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	—	
P-VV-9	VALVE VAULT	10"	NO	YES	—	—	
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: September 22, 2020 **INSPECTOR(S):** ML

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION: ODORS	CONDITION: DEFECTS	SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
FD-1	Flow Distribution	0"	No	NONE	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	—	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	—	—	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	—	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	—	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	—	
P-VV-9	VALVE VAULT	10"	NO	YES	—	—	
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: October 27, 2020 | **INSPECTOR(S):** ML

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION:		SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
			ODORS	DEFECTS			
FD-1	Flow Distribution	0"	No	NONE	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	———	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	—	———	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	———	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	———	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	———	
P-VV-9	VALVE VAULT	10"	NO	YES	—	———	
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: November 20, 2020 | **INSPECTOR(S):** ML

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION: ODORS	CONDITION: DEFECTS	SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
FD-1	Flow Distribution	0"	No	NONE	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	—	------	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-9	VALVE VAULT	14"	NO	YES	—	------	
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

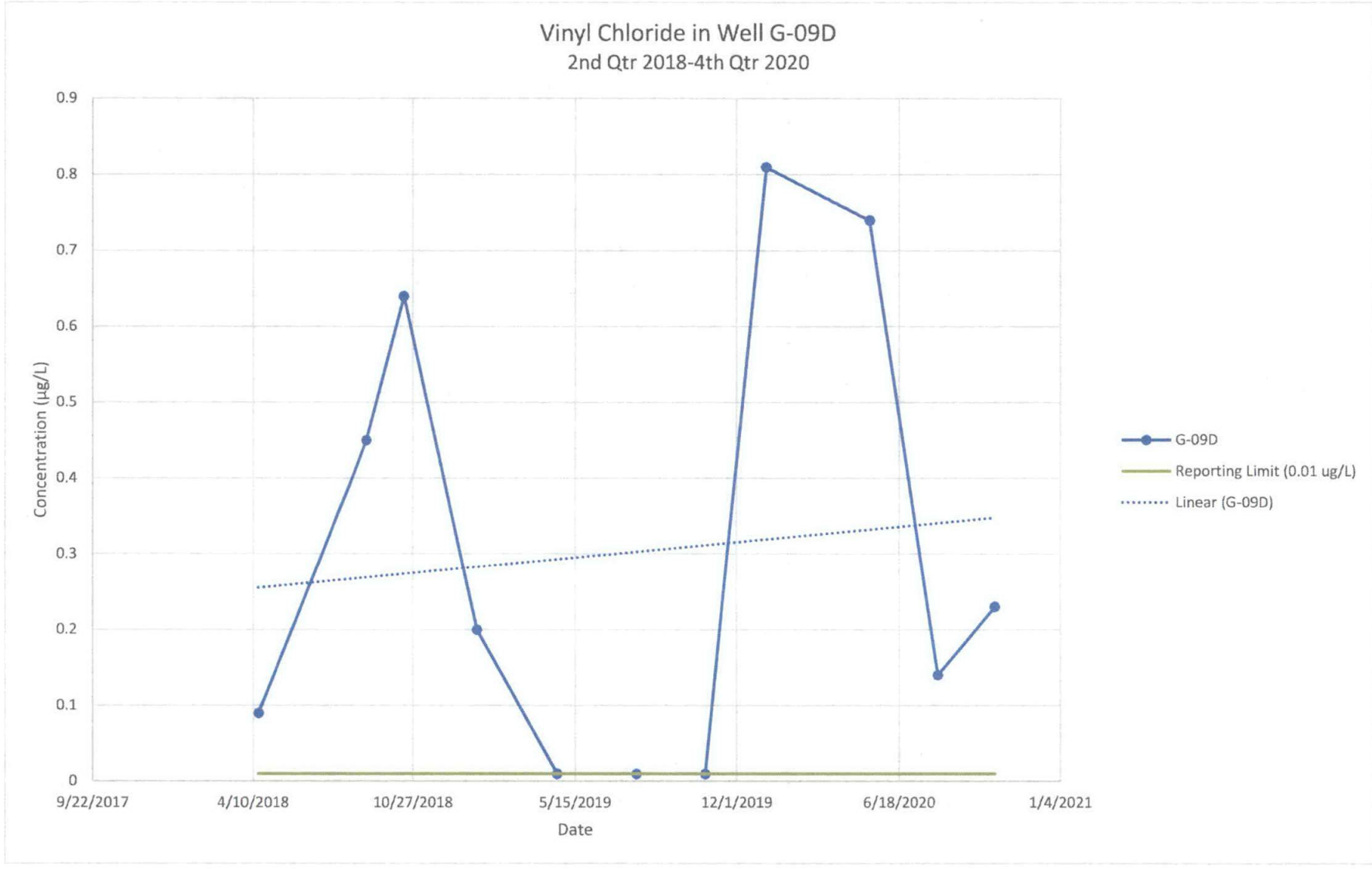
DATE: December 29, 2020 **INSPECTOR(S):** SW

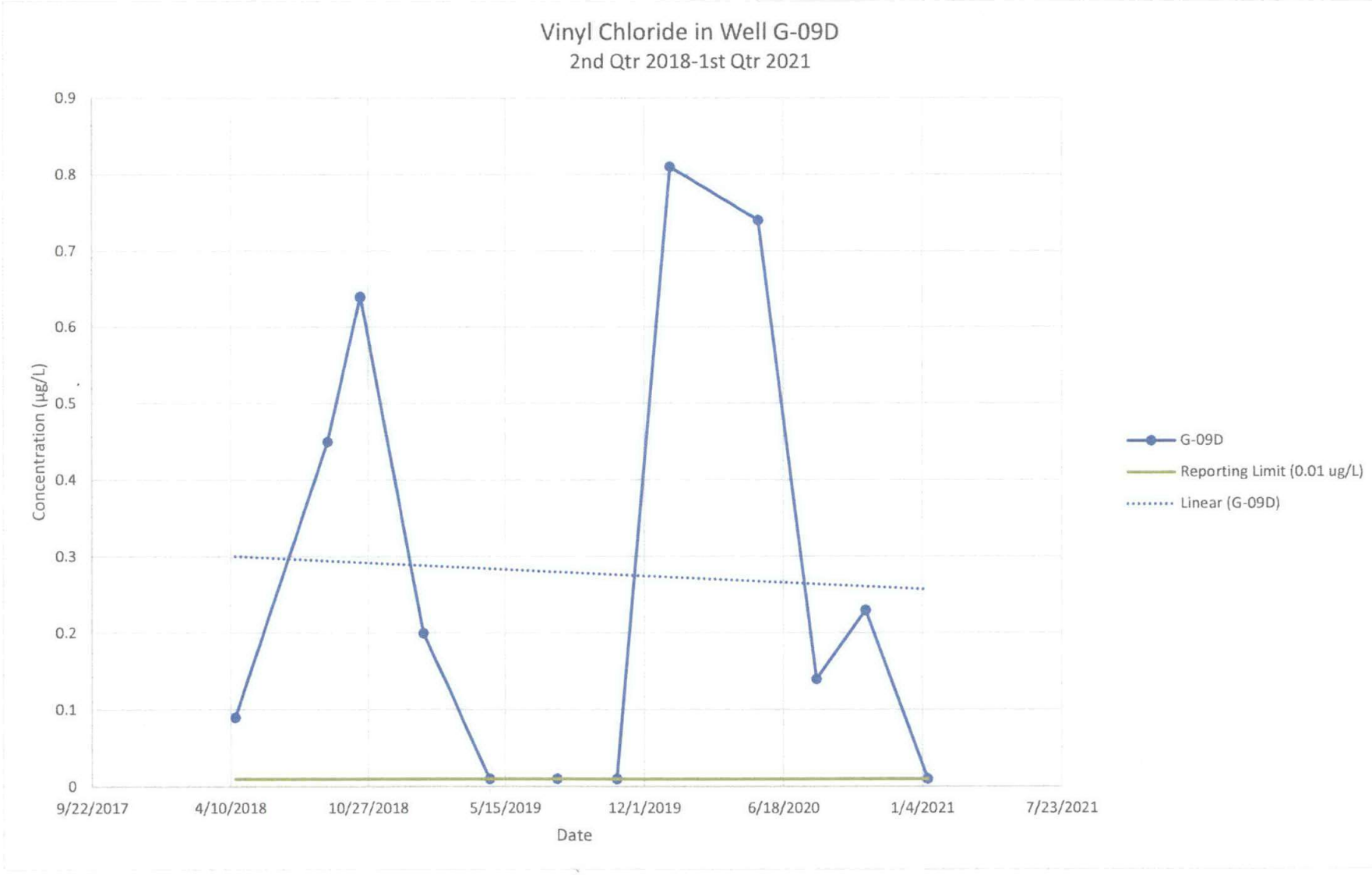
LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION: ODORS	CONDITION: DEFECTS	SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
FD-1	Flow Distribution	0"	No	NONE	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	—	-------	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-9	VALVE VAULT	14"	NO	YES	—	------	Vactored 12/23/20
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

Appendix E

Graphs of Vinyl Chloride in Well G-09D


Vinyl Chloride in Well G-09D
2nd Qtr 2018-4th Qtr 2020
Concentration (µg/L)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
9/22/2017
4/10/2018
10/27/2018
5/15/2019
12/1/2019
6/18/2020
1/4/2021
Date
G-09D
Reporting Limit (0.01 ug/L)
Linear (G-09D)


Vinyl Chloride in Well G-09D
2nd Qtr 2018-1st Qtr 2021
Concentration (µg/L)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
9/22/2017
4/10/2018
10/27/2018
5/15/2019
12/1/2019
6/18/2020
1/4/2021
7/23/2021
Date
G-09D
Reporting Limit (0.01 ug/L)
Linear (G-09D)