

Horn Rapids Landfill 2025 Annual Environmental Monitoring Report

Prepared for
City of Richland



March 2026

ParametriX

Horn Rapids Landfill 2025 Annual Environmental Monitoring Report

Prepared for

City of Richland
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March 2026 | 555-3820-004

Citation

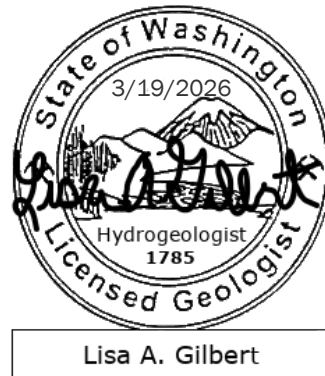
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Environmental Monitoring Report.
Prepared for City of Richland
by Parametrix, Seattle, Washington.
March 2026.

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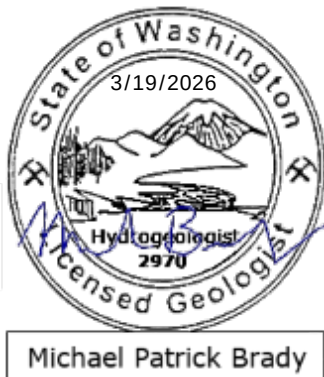
The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional hydrogeologist licensed to practice as such, is affixed below.



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CHECKLIST FOR GROUNDWATER REPORTING
Municipal Solid Waste Landfills
WAC 173-351-415

Include a signed, completed copy of this checklist with each quarterly and annual report.

Quarterly groundwater reports shall be submitted to the jurisdictional health department and Ecology within 60 days of receipt of analytical data. Annual groundwater reports shall be submitted to the jurisdictional health department and Ecology by April 1 of each year.

1 st ☐	2 nd ☐	3 rd ☐	4 th ☒	YEAR: <u>2025</u>	Reference (section, subsection)	Included in this report	Location – page # or appendix #
<i>Quarterly Groundwater Reports: 173-351-415 (2) plus the referenced section</i>							
Statistical calculations and summaries						☒	Page 4-2 to 4-6
Descriptive statistics					420, (1)	☒	Appendix E
Statistical tests					420, (2)	☒	Appendix D
Notification of statistical increase (if applicable)					420, (4)	☒	Page 3-1
Notification of concentrations above Chapter 173-200 WAC criteria (if any)					430, (4)	☒	Tables 3-1 and 3-2
Static water level readings					415, (2)	☒	Appendix G
Potentiometric surface elevation maps depicting flow direction					415, (2)	☒	Appendix G
Flow rate – calculated					415, (2)	☒	Page 5-1
Cation-anion balances					430, (5a)	☒	Appendix F
Explanation of greater than 5% (or 10%) difference if needed					430, (5a)	☒	Page 4-9
Trilinear diagrams					430, (5b)	☒	Appendix F
Leachate analyses (if sampled and tested)					415, (2)	☒	Page 7-1
Data entered into EIM database					415, (3)	☒	Submitted
Complete copy of the lab report with chain of custody record						☒	Appendix B
<i>Annual Groundwater Reports: 173-351-415 (1) YEAR: 2025</i>							
Summary of statistical results and trends					415, (1)	☒	Page 4-2 to 4-7
Summary of groundwater flow rate and direction for the year					415, (1)	☒	Page 5-1
Copy of all potentiometric maps for the year					415, (1)	☒	Appendix G
Summary geochemical evaluation					415, (1)	☒	Page 5-3
<i>For Quarterly and Annual Reports</i>							
Stamped by a licensed professional					RCW 18.220	☒	

Lisa A. Hint

Signature of Report Author

March 2026

Date

Horn Rapids

Landfill

Acronyms and Abbreviations

BFHD	Benton-Franklin Health District
bgs	below ground surface
City Facility	275-acre parcel of City-owned property
City	City of Richland Public Works Department
CULs	Cleanup Levels
CQA	Construction Quality Assurance
DO	dissolved oxygen
DCA	Dichloroethane
DCE	Dichloroethene
Ecology	Washington Department of Ecology
EDC	1,2-dichloroethane
EPA's	U.S. Environmental Protection Agency
FS	Feasibility Study
ft	feet
GWQSSs	Water Quality Standards for Groundwaters of the State of Washington (WAC 173-200-040)
IHS	Indicator Hazardous Substances
LFG	landfill gas
LP1	New Landfill Leachate Pond 1
LP2	New Landfill Leachate Pond 2
MCLs	Maximum Contaminant Levels (WAC 246-290-310)
mg/L	milligrams per liter
MSW	municipal solid waste
MTCA	Model Toxics Control Act (Chapter 173-340 WAC)
New Landfill	104-acre landfill expansion
Old Landfill	46-acre historical landfill
ORP	oxidation-reduction potential
ORV	off-road vehicle
PCE	tetrachloroethene
Permit	Solid Waste Permit
QAPP	Quality Assurance Project Plan
RI	Remedial Investigation
RNG	renewable natural gas
TCE	trichloroethene
TDS	total dissolved solids
TOC	total organic carbon
UTLs	Upper Tolerance Limits
VC	vinyl chloride
VOCs	volatile organic compounds

1. Introduction

This report presents the 2025 environmental monitoring results of groundwater, landfill gas (LFG), and leachate for the City of Richland's Horn Rapids Landfill. Groundwater sampling was conducted by Parametrix personnel and LFG probe monitoring was conducted by City of Richland (City) Public Works Department personnel in accordance with an operating permit issued by the Benton-Franklin Health District (BFHD). The City Facility layout is presented on Figure 1-1 and monitoring well and LFG probe locations are shown on Figures 1-2 and 1-3. Leachate and lysimeter sampling points are shown on Figure 1-4.

The following terminology related to the Horn Rapids Landfill has been developed, as further described in Section 2:

- City Facility: 275-acre permitted waste site, including landfill, customer transfer station, and compost facility (Figure 1-1).
- Old Landfill: 46-acre permitted area within the City Facility where municipal solid waste (MSW) was placed between the 1970's and 2020. The western older portion is referred to as Old Landfill Phase 1 and the newer eastern portion is referred to as Old Landfill Phase 2. The Old Landfill does not have a bottom liner.
- City Property: Contiguous property (approximately 1,820 total acres) owned by the City of Richland, includes the City Facility.
- New Landfill, also referred to as Expansion: 104-acre lined expansion located east of the Old Landfill on the City Facility. The City began placing MSW into Phase 1 of the New Landfill in 2020. The New Landfill has a bottom liner and a double lined leachate storage and evaporation pond (referred to as the New Landfill Phase 1 Leachate Pond or LP1). Phase 2 of the New Landfill has been constructed immediately south of Phase 1. Phase 2 construction also included the installation of a new leachate storage and evaporation pond (LP2) east of the existing Phase 1 Leachate Pond (Figure 1-1).

2. Background

2.1 City Facility Setting

The City Facility is owned and operated by the City. It is located within the city limits of Richland, Washington in a rural area bounded by Twin Bridges Road on the west, Horn Rapids Road on the north, and State Route 240 on the south. The City Facility (Figure 1-1) is a 275-acre parcel that includes the 46-acre historical landfill (Old Landfill), a support facility, an approximately 20-acre composting facility, a City-operated shooting/pistol range, a private renewable natural gas (RNG) plant operated by Pine Creek, a flare facility and condensate pond, a customer service transfer station that includes a small household hazardous waste receiving area, and the 104-acre landfill expansion (New Landfill) permitted for disposal of MSW and its associated leachate pond. The New Landfill began operation in the fall of 2020.

The City also owns contiguous property (City Property) to the west, south and east of the City Facility (a total of approximately 1,820 total acres), with the exception of several small privately-owned parcels, two located along the southwest corner of the City Facility, and one in the northeast corner of the City Facility. Immediately east of the City Facility are circle-irrigated agricultural fields used to grow alfalfa hay, corn, and potatoes. The City Property immediately west of the City Facility has been developed as an off-road vehicle (ORV) park that includes a road-racing track and a motocross track facility. Additional agricultural fields are located further west and northwest. The remaining City Property south and southeast of the City Facility is undeveloped.

2.2 Landfill Description

The Old Landfill began receiving MSW into the western portion referred to as Old Landfill Phase 1 in 1974. The Old Landfill was initially developed by placing MSW into a series of north-south oriented trenches. The waste depths in the trenches ranged from 12 to 30 feet (ft) below ground surface (bgs). From 2005 to 2010, Old Landfill Phase 1 was filled and graded in accordance with the closure grading plan and officially closed in 2011. Closure of this section of the Old Landfill included capping and installation of an active LFG collection system.

MSW was accepted in the eastern portion of the Old Landfill referred to as Old Landfill Phase 2 through September 2020. Closure of Old Landfill Phase 2 began with installation of LFG extraction wells in 2021; closure cover was completed and LFG extraction was initiated in July 2023. Placement of MSW began in Phase 1 of the New Landfill on the eastern portion of the City Facility in 2020. The City is currently in the construction phase for Phase 2 of the New Landfill that will be located south of the New Landfill Phase 1.

Leachate generated from the New Landfill is collected via a network of perforated pipes installed above the liner. The leachate is conveyed to a leachate storage and evaporation ponds (LP1 and LP2) north of Phase 1. The leachate ponds are constructed with a double liner and leak detection sumps to check for the presence of liquids. Leachate pond management and collection details are shown on Figure 1-4. Four lysimeters installed in the vadose zone beneath the MSW in the northeastern portion of the Old Landfill are monitored annually for the presence of leachate (Parametrix 2021a).

2.3 Hydrogeologic Setting

Groundwater in the uppermost aquifer occurs under water table conditions in the sand, silt and gravel sediments of the middle Ringold Formation, and the aquifer thickness is approximately 80 to 110 ft (Parametrix 2017b). The uppermost aquifer beneath the City Facility occurs at depths of approximately 75 to 110 ft bgs at the normal grade of the Facility but at a depth of approximately 17 ft bgs near the Leachate Pond. The pond is approximately 8 feet deep, placing the lowest point of the primary pond liner approximately 9 ft above the water table. Water levels are at elevations of approximately 385 to 388 ft NAVD88 and typically fluctuate less than a foot throughout the year. The overall groundwater gradient across the City Facility is relatively flat, approximately 0.0005 ft/ft.

Regionally, groundwater flow has been documented to be eastward toward the Columbia River (Shaw 2003). However, historical groundwater measurements at the City Facility have shown effects of artificial groundwater recharge from intermittent crop circle irrigation both immediately to the east and further west and northwest, activities at the local ORV Park to the west, and the on-site stormwater infiltration pond located south of the condensate pond. These sources of artificial groundwater recharge cause fluctuations in the groundwater flow direction both temporally and seasonally at the City Facility.

Crop circle irrigation has been used to grow alfalfa hay, corn and potatoes proximate to the City Facility since 1987. The source of the irrigation water is reported to be from the Columbia River. Historical groundwater measurements have indicated the irrigated crop circles on the City Facility's eastern boundary have historically deflected the flow in the eastern portion of the City Facility seasonally toward the southeast.

Activities at the ORV park located west of the City Facility including boat racing, septic system operation, and irrigation may periodically alter local groundwater flow directions at the City Facility. From 1999 to the mid-2000s the ORV park periodically flooded shallow unlined waterways for boat racing then allowed the water to seep into the ground after race events. The ORV park seasonally irrigates the Tri City Kart Club that operates on the ORV park and the ORV park has four septic systems, including a bathroom/shower facility designed for 4,000 uses per day.

The northern on-site stormwater infiltration pond has been active since approximately 2010 and receives drainage from the majority of the Old Landfill Phase 1. The infiltration pond was recently improved in 2023, expanding the capture area of the infiltration pond to also receive drainage from the Old Landfill Phase 2. During the improvements, it was discovered that several low areas of the conveyance ditch were allowing water to infiltrate locally rather than reaching the pond. The low areas north of the Old Landfill Phase 2 were fixed, however, some additional low areas near the Old Landfill Phase 1 may be contributing additional local recharge.

All of these activities contribute to artificial groundwater recharge that may affect groundwater flow direction, steepening the groundwater gradient on the northwest portion of the City Facility and shifting flow slightly toward the south-southeast.

2.4 Monitoring Well History

The initial groundwater monitoring network consisted of one upgradient well (MW-1) located on the western boundary of the City Facility and three downgradient monitoring wells (MW-2, MW-3, and MW-4) located along the eastern boundary of the City Facility. In 1998, two additional wells (MW-5 and MW-6) were installed along the eastern edge of the Old Landfill. Additional downgradient

wells MW-7 through MW-10 were installed in 2001 (Shaw Environmental, Inc. 2003, 2004). Well MW-7 was decommissioned in 2010 because it was located within the construction footprint of the closure of the Old Landfill Phase 1. Additional upgradient well MW-11 was installed in 2010 as part of permitting for the New Landfill. Additional downgradient groundwater well MW-12 was installed on City Property southeast of the City Facility in 2018 as part of the remedial investigation (RI; Parametrix 2021a), described further in Section 2.5 below. Two future monitoring wells are proposed to the north and northeast to monitor the northern portion of the Expansion Area when the New Landfill expands north of Phase 1.

2.5 Regulatory History

The Horn Rapids Landfill was originally permitted under Chapter 173-301 Washington Administrative Code (WAC) and currently operates under the Criteria for Municipal Solid Waste Landfills, Chapter 173-351 WAC and the current Solid Waste Permit (Permit) issued by the BFHD. Groundwater monitoring has been performed since 1987 and is currently documented in quarterly and annual groundwater monitoring reports in accordance with Chapter 173-351 WAC.

Concentrations of volatile organic compounds (VOCs) were detected above the WAC 173-200-040 Groundwater Quality Criteria, including tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride (VC), in groundwater monitoring wells MW-5 and MW-6 installed in 1998 (Shannon & Wilson 1998). The City notified BFHD and Washington Department of Ecology (Ecology) in a letter dated February 18, 2000 that statistically significant increases in groundwater contaminants were confirmed during monitoring activities and that the increases in concentration would be addressed through a formal corrective action process under the Model Toxics Control Act (MTCA; Chapter 173-340 WAC). Ecology sent the City a MTCA Early Notice letter on March 6, 2000, and the Horn Rapids Landfill was placed on Ecology's Confirmed or Suspected Contaminated Sites list for groundwater contamination (Facility/Site No. 308).

To comply with MTCA requirements, the City chose to conduct a MTCA independent cleanup of the groundwater by performing a RI and Feasibility Study (FS). From 2001 through 2004, the City performed an independent, two-phased RI (Shaw Environmental Inc. 2003, 2004), and in 2004, they performed a LFG pilot study/FS (Shaw EMCON/OWT, Inc. 2005). The RI determined that LFG is the likely source of the VOCs impacting groundwater. A LFG pilot study (Parametrix 2005) showed LFG extraction would effectively remove VOCs from the subsurface and supported installation of the LFG extraction system during closure as a remedy.

Between 2005 and 2010, the western portion of the Old Landfill was filled and graded to approved closure grading plans (EMCON 1999; Parametrix 2006, 2008, 2011) and was closed in 2011 (Parametrix 2011, 2012a, 2012b) as an independent remedial action in accordance with Chapter 173-340 WAC. The closure included a final cover and gas collection system consisting of in-refuse LFG wells, collection manifold and laterals, a condensate manhole, and a flare station. The LFG collection system was activated in September 2011 to prevent subsurface LFG migration beyond the Old Landfill perimeter and to remove VOCs from groundwater. The collection system has operated 24 hours a day since startup. The eastern portion of the Old Landfill was filled to grade in September 2020. Closure began with the installation of LFG wells in 2021 and 2022. The cover installation and activation of LFG extraction was completed in late July 2023.

In 2013, Ecology requested that additional activities be conducted to comply with the assessment monitoring requirements of WAC 173-351-440. Assessment monitoring is required whenever statistical increases and concentrations above the criteria in WAC 173-200-040, Water Quality

Standards for Groundwaters of the State of Washington, have been detected for one or more of the constituents listed in WAC 173-351-990 Appendix I. The following activities were completed:

- During the second quarter of 2014, in addition to the groundwater monitoring wells, samples were collected from an additional monitoring well (W-1) located on the east side of the Weidle neighborhood, south of and more than a mile from the Landfill (Parametrix 2014). Although well W-1 is located in a direction that is not downgradient of the Landfill, the sample was collected to confirm that the Landfill was not impacting drinking water wells in the Weidle neighborhood. The groundwater quality data did not indicate any impacts from the Landfill.
- Testing for WAC 173-351-990 Appendix III parameters was conducted annually in phases between 2014 and 2022. Initially, testing included one well near the active cell and one well at the City Facility boundary in the second quarter of each year. The tested wells were MW-6 and MW-9 (2014), MW-5 and MW-8 (2015), and MW-4 and MW-10 (2016). The results of the testing did not detect any Appendix III compounds other than the VOCs identified during the RI. Therefore, beginning in 2017, annual testing for the additional Appendix III parameters was conducted on a rotating schedule at one of the three wells located closest to the Landfill (MW-5, MW-6, and MW-10), or at wells MW-4, MW-8, and MW-9 located at the City Facility boundary. Testing was conducted at well MW-6 in 2017, MW-10 in 2018, MW-5 in 2019, MW-9 in 2020, MW-8 in 2021, and MW-4 in 2022.

As discussed in a letter submitted to BFHD (Parametrix 2022) testing for the WAC 173-351-990 Appendix III assessment monitoring parameters was discontinued in 2023 since none of the additional parameters have been detected other than VOCs which are listed as detection monitoring constituents in WAC 173-351 Appendix I. Therefore, the Site has met the criteria "concentrations of all Appendix III constituents are at or below background values for two consecutive events" per WAC 173 351-440(5).

In July 2017, the City entered into an Agreed Order (No. DE 13717) with Ecology in accordance with MTCA to complete a RI/FS. A Remedial Investigation Work Plan (Parametrix 2017d) was approved by Ecology (Ecology 2017) and Phases 1 and 2 of the Work Plan were completed in November 2017 (Parametrix 2018) and November 2018 (Parametrix 2019), respectively. Phase 1 consisted of a push probe investigation to evaluate the furthest extent of the contamination directly downgradient from the central portion of the contaminant plume, and Phase 2 consisted of installing permanent groundwater monitoring well MW-12 at a location beyond the area of impact to be used as a sentinel well for the assessment monitoring program.

The draft RI Report was submitted to Ecology in January 2021 (Parametrix 2021a) and included quarterly groundwater and LFG monitoring data collected through second quarter 2020. The 2021 draft RI Report expanded upon the findings of the previous RI that showed groundwater impacts were primarily related to LFG migration. The updated RI showed the areal extent of groundwater contamination did not extend beyond 500 ft from the City Facility boundary and that nearby groundwater resources had not been impacted. The draft RI Report developed a preliminary list of Indicator Hazardous Substances (IHS) to be further evaluated in the FS under WAC 173-340-703 that consist of total arsenic, 1,1-dichloroethane (1,1-DCA), bromodichloromethane, chloroform, cis-1,2-dichloroethene (cis-1,2-DCE), PCE, TCE, and VC. The draft RI Report also indicated the likely cleanup remedy to be the planned Old Landfill Phase 2 closure and LFG removal combined with monitored natural attenuation of the groundwater contamination.

Ecology's comments on the draft RI Report (Ecology 2022) included the opinion that the extent of VOCs in groundwater is not fully delineated. This conclusion was based in part on the increasing trends in some VOCs observed over the past 5 years in wells MW-3 and MW-4 located along the eastern City Facility boundary, particularly in consideration of the more easterly flow direction observed over the past few years. The presumptive remedy for the City Facility has remained closure of the Old Landfill, LFG control, and natural attenuation through biodegradation.

The Old Landfill Phase 2 closure is expected to further reduce the source of VOCs to groundwater and address the increasing trends observed in wells near the City Facility boundary. The City developed an approach and timeframe (Parametrix 2024) for evaluating 2 years of additional monitoring data through 2025 to assess the effects of the interim remedial measures completed since the closure of the Old Landfill in late July 2023 with installation of the landfill cover and activation of the LFG extraction system. Ecology has agreed with this approach for the timing of the final RI and FS. The RI will be updated to incorporate the data through 2025 and a FS report will be prepared in accordance with the MTCA Agreed Order. It is anticipated that the FS will focus on the Old Landfill closure, LFG control, and biodegradation as the likely cleanup remedy.

3. Compliance Status Summary

The compliance status with respect to the requirements of Chapter 173-351 WAC and the Permit is described below for groundwater, LFG, and leachate.

3.1 Groundwater

Groundwater monitoring is being conducted to evaluate contaminant trends related to the known release from the Old Landfill being investigated as part of the MTCA RI/FS in accordance with Chapter 173-340 WAC, and to confirm that contaminants are not being contributed from the New Landfill in accordance with Chapter 173-351 WAC. Concentrations of groundwater contaminants in this report are compared to *Water Quality Standards for Groundwaters of the State of Washington* (GWQSS) published in WAC 173-200-040, and *State Drinking Water Regulations/Maximum Contaminant Levels* (MCLs) published in WAC 246-290-310. MTCA Cleanup levels (CULs) will be developed as part of the FS in accordance with Chapter 173-340 WAC.

As summarized in Table 3-1, parameters in groundwater wells during 2025 were detected at concentrations above GWQSS and MCLs. Summaries of the 2025 groundwater monitoring data are provided in Table A-1 (WAC 173-351-990 Appendix I and II parameters) located in Appendix A.

Table 3-2 summarizes the highest 2025 concentrations exceeding criteria in upgradient (MW-1, MW-11) or cross gradient (MW-2) wells, and downgradient wells along the edge of the Old Landfill (MW-5, M-6, and MW-10), along the City Facility boundary (MW-3, MW-4, MW-8, and MW-9), and on City Property (MW-12).

3.2 Landfill Gas

Methane concentrations are monitored in LFG probes at thirteen locations (see Figure 1-3). No methane was detected above the regulatory limit of 5 percent in the 2025.

The extent of LFG migration has remained in close proximity to the perimeter of the Old Landfill and concentrations have not exceeded the 5 percent by volume regulatory action limit at the City Facility boundary.

Table 3-1. Wells with Detected Concentrations above Groundwater Quality Criteria, 2025

Parameter	GWQS		MCL	
	Upgradient or Cross Gradient	Downgradient	Upgradient or Cross Gradient	Downgradient
FIELD PARAMETERS				
Conductivity	--	--	MW-1, MW-11	MW-5, MW-6, MW-8, MW-9, MW-10
pH	MW-11	MW-5, MW-6, MW-9, MW-10	--	--
INORGANICS				
Arsenic	MW-1, MW-2, MW-11	MW-1 through MW-6, MW-8 through MW-12	--	--
Chloride	--	MW-6	--	MW-6
Iron, dissolved	--	MW-10	--	MW-10
Manganese, dissolved	--	MW-5, MW-6, MW-10	--	MW-5, MW-6, MW-10
Nitrate	MW-2, MW-11	MW-4, MW-6, MW-8, MW-10	MW-2, MW-11	MW-4, MW-6, MW-8, MW-10
Sulfate	MW-11	MW-5, MW-6, MW-10	MW-11	MW-5, MW-6, MW-10
Total Dissolved Solids (TDS)	MW-11	MW-5, MW-6, MW-8, MW-9, MW-10	MW-11	MW-5, MW-6, MW-8, MW-9, MW-10
VOCS				
1,1-Dichloroethane (1,1-DCA)	--	MW-4, MW-5, MW-6, MW-9, MW-10, MW-12	--	--
Bromodichloromethane	--	MW-8	--	--
Chloroform	--	MW-8	--	--
Tetrachloroethene (PCE)	MW-1	MW-4, MW-5, MW-6, MW-9, MW-10	MW-1	MW-5, MW-6, MW-9, MW-10
Trichloroethene (TCE)	--	MW-5, MW-6, MW-9	--	--
Vinyl Chloride (VC)	--	MW-5, MW-10	--	--

MW-1 and MW-11 are upgradient from the Landfill; MW-2 is cross-gradient from the Landfill
 GWQS = Water quality standards for groundwaters of the State of Washington (WAC 173-200-040).
 MCL = Maximum Contaminant Level (WAC 246-290-310)
 -- = Not applicable

Table 3-2. Highest Reported Concentrations of Parameters above Groundwater Quality Criteria, 2025

Parameter	Units	GWQS	MCL	Highest Observed Concentration Above Criteria						City Property (MW-12)
				Upgradient or Cross Gradient (MW-1, -2, -11)	Downgradient					
					Adjacent to Landfill (MW-5, -6, -10)		City Facility Boundary (MW -3, -4, -8, -9)			
					Concentration	Well	Concentration	Well	Concentration	
FIELD PARAMETERS										
Conductivity	µmhos/cm	--	700	1960	MW-11	3644	MW-6	1059	MW-9	--
pH	None	6.5-8.5	--	6.45	MW-11	6.14	MW-10	6.42	MW-9	--
INORGANICS										
Arsenic	mg/L	0.00005	0.01	0.00660	MW-11	0.00707	MW-6	0.00902	MW-3	0.00802
Chloride	mg/L	250	250	--	--	290	MW-6	--	--	--
Iron, dissolved	mg/L	0.30	0.30	--	--	0.420	MW-10	--	--	--
Manganese, dissolved	mg/L	0.05	0.05	--	--	3.62	MW-5	--	--	--
Nitrate	mg/L	10	10	54	MW-11	80.4	MW-6	26	MW-8	--
Sulfate	mg/L	250	250	379	MW-11	373	MW-6	--	--	--
Total Dissolved Solids (TDS)	mg/L	500	500	1480	MW-11	1950	MW-6	651	MW-8	--
VOCS										
1,1-Dichloroethane (1,1-DCA)	µg/L	1	--	--	--	3.70	MW-10	3.63	MW-4	1.65
Bromodichloromethane	µg/L	0.3	80	--	--	--	--	0.66	MW-8	--
Chloroform	µg/L	7	80	--	--	--	--	9.37	MW-8	--
Tetrachloroethene (PCE)	µg/L	0.8	5	5.34	MW-1	13.9	MW-6	10.6	MW-9	--
Trichloroethene (TCE)	µg/L	3	5	--	--	6.18	MW-6	3.62	MW-9	--
Vinyl Chloride (VC)	µg/L	0.02	2	--	--	1.32	MW-5	--	--	--

MW-1 and MW-11 are upgradient from the Landfill; MW-2 is cross-gradient from the Landfill

GWQS = Water quality standards for groundwaters of the State of Washington (WAC 173-200-040).

MCL = Maximum Contaminant Level (WAC 246-290-310)

-- = Not applicable

3.3 Leachate

3.3.1 Old Landfill

Four lysimeters monitor the vadose zone directly beneath the MSW located in the northeast corner of the Old Landfill (see Figure 1-4). A permit modification was granted by BFHD (2017) and beginning in 2017, the vadose zone ports have been checked annually during the third quarter. The ports were checked during the third quarter and liquid was not observed in any of the ports, therefore no samples were collected.

3.3.2 New Landfill

Samples from the Phase 1 Leachate Pond (LP1) have been collected annually beginning in 2022. During the first quarter 2025 event, Leachate Pond samples were analyzed for WAC 173-351-990 Appendix I and II parameters (Parametrix 2025d). Table A-2 summarizes the results of the leachate sampling.

A leak was identified in the primary liner of LP1 (Parametrix 2025a; 2025b; 2025c) and is further discussed in Section 7.2. Ecology (2025) recommended that the BFHD require an electrical leak detection test (ASTM D7007) of the primary and secondary pond liners to confirm if a leak is present and to determine its location. The City has yet to schedule the test with BFHD, but measures have been taken in preparation. These measures include constructing LP2 east of LP1 (see Figure 1-1 and 1-4), transferring the contents from LP1 to LP2, and removing the primary liner of LP1. These actions were conducted following completion of the fourth quarter groundwater monitoring event (Richland 2026). Prior to the pond transfer, several measures were taken to avoid potential associated impacts from the Phase 1 primary pond liner leak including control of the level of leachate below the free board and regular evacuation of liquid within the secondary containment sump.

4. Groundwater Monitoring

This report includes the following information for the 2025 groundwater monitoring, per the Permit and the quarterly reporting requirements delineated in WAC 173-351-415 (1) and (2):

- Laboratory reports for fourth quarter 2025 (Appendix B).
- Field measurements and analytical laboratory results for the sampling period (Appendix A).
- Statistical calculations and summaries, including Sen's slope/Mann Kendall tests for trend, (Appendix D); and background groundwater quality statistical summary (Appendix E).
- Notification of results that exceed concentrations above GWQSS (Tables 3-1 and 3-2).
- Cation-anion balances, trilinear diagrams, and stiff diagrams (Appendix F).
- Static water level measurements for each monitoring well and potentiometric surface elevation map depicting groundwater flow rate and direction (Appendix G).

In addition, the report contains the following information required by the Permit and BFHD correspondence:

- Time-series plots for all constituents tested (Appendix C).
- LFG data (Appendix H).

4.1 Sampling and Analysis

Groundwater samples were collected quarterly in 2025 from eleven monitoring wells (MW-1 through MW-6, MW-8 through MW-12) in accordance with the Quality Assurance Project Plan (QAPP; Parametrix 2017a).

Groundwater samples were collected with dedicated sampling pumps using a low-flow purging technique. Samples to be tested for dissolved metals were filtered in the field through 0.45-micron filters. A duplicate sample (MW-21) was collected from a different well during each quarterly event.

The groundwater samples were analyzed for the constituents identified in Appendix I and Appendix II of WAC 173-351-990, and for additional natural attenuation parameters added as part of the RI (Shaw Environmental, Inc. 2003). Laboratory analyses were conducted by Analytical Resources, Inc. in Seattle, Washington, with the exception of the nitrate analyses that were conducted by Energy Northwest in Richland, Washington due to holding time considerations.

4.2 Groundwater Quality Results and Comparison to Criteria

The laboratory reports for the fourth quarter are provided in Appendix B. The data were evaluated with respect to the data validation criteria described in the QAPP, and a memorandum is provided in Appendix B. The laboratory reports and data validation memoranda for the first, second, and third quarters were presented in previous reports (Parametrix 2025d,f,g).

Table A-1 (WAC 173-351-990 Appendix I and II parameters) in Appendix A provides a summary of the 2025 groundwater monitoring results. The groundwater results are compared to the GWQSS (WAC 173-200-040) and MCLs (WAC 246-290-310).

4.3 Groundwater Data Evaluation Approach

Statistical analysis procedures for evaluation of groundwater monitoring data are outlined in the QAPP (Parametrix 2017a) and are summarized in the following paragraphs. The procedures were developed in accordance with U.S. Environmental Protection Agency (EPA's) *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Unified Guidance* (Unified Guidance; EPA 2009) as recommended in Ecology guidance documents (Ecology 2012).

Prior to 2016, quarterly reports included comparison of the downgradient well data to Upper Tolerance Limits (UTLs) calculated based on background data for upgradient well MW-1 (Parametrix 2016). Statistically significant increases over background were identified in the monitoring wells downgradient of the Old Landfill and confirmed a release. As described in Section 2.2, a remedy was partially completed in 2011 with the Old Landfill Phase 1 closure and fully completed in 2023 with the Old Landfill Phase 2 closure. As part of the MTCA RI, data have been evaluated to assess the effectiveness of closure activities on mitigating the existing groundwater contamination. The current statistical approach follows assessment monitoring approaches outlined in the QAPP and WAC-173-351-440 and consists of evaluating trends qualitatively using time-series plots and quantitatively using Sen's slope and Mann-Kendall tests.

Corrective action in the form of final closure construction was completed at the Old Landfill in July 2023. Monitoring wells near the eastern edge of the Old Landfill (MW-5, MW-6, and MW-10) that have shown significant impacts are being monitored for evidence that VOC concentrations in the wells are continuing to decrease indicating that the LFG system is preventing VOC migration to groundwater.

Wells at the City Facility boundary (MW-3, MW-4, MW-8, and MW-9) and on further downgradient City Property (MW-12) are being monitored to assess the degree of attenuation of VOCs. The City has developed an approach and timeframe for evaluating additional monitoring data to assess the effects of the interim remedial measures completed (Parametrix 2024).

4.4 Time-Series Plots

Time-series plots are presented in Appendix C for constituents with concentrations exceeding groundwater quality criteria or that historically exceeded UTLs and regularly detected VOCs. The observed trends are discussed separately in the following sections for VOCs and inorganic parameters. In the case where a parameter is tested for but not detected, the "concentration" of that parameter is plotted at the reporting limit and a hollow symbol is shown.

The groundwater data (Appendix C-1) are separated into two groups, one group with wells along the edge of the Old Landfill Phase 2 Closure (MW-5, MW-6, former well MW-7 (historical data), and MW-10), and a second group with wells along the City Facility boundary (MW-2, MW-3, MW-4, MW-8 and MW-9) and well MW-12 on further downgradient City Property. Upgradient wells MW-1 and MW-11 are included on both sets of plots. VOC data for leachate port samples are included with the wells along the edge of the Old Landfill Phase 2 Closure.

4.4.1 Volatile Organic Compounds

VOCs provide an unambiguous indicator of landfill impacts since other typical landfill indicator parameters have been impacted by upgradient sources. Overall, the time series plots show VOC concentrations appear to have stabilized and/or are decreasing, with limited exceptions, in nearly all the monitoring wells.

4.4.1.1 Downgradient

The greatest number and highest concentrations of VOCs are detected in the monitoring wells immediately downgradient of the Old Landfill (MW-5, MW-6, and MW-10) and are primarily chlorinated solvents including 1,1-dichloroethane (DCA), 1,2-dichloroethene (EDC), cis-1,2-dichloroethene (DCE), trans-1,2-DCE, tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride (VC). Decreasing trends in VOC concentrations have been observed in these wells over the past approximately 20 years.

A similar suite of VOCs has been detected in MW-9, located near the southern City Facility boundary, including cis-1,2-DCE, PCE, and TCE, although concentrations of these VOCs have fluctuated within a stable range over the past approximately 10 years, and concentrations of 1,1-DCA have decreased since approximately 2009.

Along the eastern City Facility boundary, concentrations of VOCs are being evaluated as part of the RI (Parametrix 2024) to determine if additional investigation is necessary. Concentrations of some VOCs including cis-1,2-DCE, PCE, and TCE in well MW-4 have shown increases but have stabilized or decreased over the past 3 years (see Section 4.5, below). 1,1 DCA has also been decreasing at MW-4 since 2020. In well MW-3, chloroform concentrations increased beginning in approximately 2018 but have recently stabilized. Increases in chloroform concentrations have also been observed in wells MW-8 and MW-9, located near the southern City Facility boundary, but have also stabilized.

4.4.1.2 Upgradient/Cross Gradient

PCE in concentrations above the GWQS have consistently been detected in upgradient well MW-1, and its presence is likely related to transport by LFG from the Old Landfill.

In upgradient well MW-11 further north of the Old Landfill, benzene was detected beginning in the third quarter of 2023 and the second and third quarter 2024 concentrations were above the GWQS of 1 µg/L (no sample could be collected in the fourth quarter of 2024). Toluene, ethylbenzene and xylenes were detected in MW-11 the first quarter of 2025, and the presence of these fuel-related compounds may have indicated groundwater impacts from a source upgradient of the Landfill; however, these compounds, including benzene, were no longer present beginning in the second quarter of 2025.

4.4.1.3 City Property

In well MW-12, located downgradient south-southeast of the City Facility on City Property, 1,1-DCA and cis-1,2-DCE were detected. Concentrations were below the GWQS except the fourth quarter 2025 concentration of 1,1-DCA. These detections will continue to be monitored in future events.

4.4.2 Inorganic Parameters

Groundwater quality data collected from wells in the northern portion of the City Facility, in particular upgradient wells MW-1 and MW-11, former upgradient well MW-7, cross gradient well MW-2, and to some extent downgradient well MW-3, indicate that potential upgradient sources are contributing to area-wide background concentrations of inorganic compounds, including conductivity/total dissolved solids (TDS), chloride, nitrate, sulfate, and dissolved cations (calcium, magnesium, and potassium).

Relatively high concentrations of these parameters are observed in upgradient well MW-11, increasing until approximately 2016 and stabilizing since then, although nitrate concentrations have

continued to increase. Data spikes observed in these wells suggest that more than one source may have contributed to pulses of contaminants over time.

Likely potential upgradient sources are those that involve application of water that could drive contaminants to the water table, such as agricultural irrigation and potential fertilizer application at the crop circles and septic systems in the adjacent ORV park. Biosolids applications in the northern portion of the City Facility have also been considered as a source but are not presently believed to have had substantial impacts since the biosolids are dry and applied in thin layers and have largely already been scraped off for other City Facility uses.

Ongoing groundwater monitoring related to the Hanford Reservation has documented occurrences of nitrate plumes in the Richland area with concentrations of greater than 10 milligrams per liter (mg/L) nitrate as N (45 mg/L Nitrate as NO₃). The sources of nitrate have been attributed to agricultural applications of fertilizer to irrigated fields (CH2M 2015). Similarly, chloride can also be leached from fertilizer applications.

4.4.2.1 Downgradient

Concentrations of inorganic parameters in wells located immediately downgradient of the Old Landfill (MW-5, MW-6, and MW-10) were generally higher than in wells located along the southern City Facility boundary (MW-8 and MW-9). However, concentrations of some inorganic parameters in wells MW-8 and MW-9 have shown increasing trends, including conductivity/TDS and chloride, nitrate, sulfate, and dissolved cations (calcium, magnesium, potassium, and sodium), although most have stabilized over the past few years.

In wells MW-5, MW-6, and MW-10, increased specific conductivity/TDS and concentrations of some parameters including alkalinity, chloride, dissolved manganese, nitrate, sulfate, total organic carbon (TOC), and dissolved cations (calcium, magnesium, potassium, and sodium), were observed to increase beginning in the second quarter of 2024. Concentrations in MW-5 and MW-10 generally stabilized throughout 2025 while remaining elevated but continued to increase in MW-6.

Concentrations in MW-6 have surpassed background conditions for several parameters (arsenic, calcium, chloride, conductivity, magnesium, nitrate, potassium, sodium, and TDS) and are now the highest observed at the Facility. Temporary increases in concentrations of some leachate indicator parameters in wells MW-5, MW-6, and MW-10 have been observed previously in the 2019 timeframe.

The increases in inorganic parameters were not correlated with increases in VOC concentrations. Since MW-10 is located directly upgradient of the New Landfill LP1, it was suspected that these increases could be related to a leak in the primary pond liner (Parametrix 2025a; 2025b; 2025c). However, since all three wells have shown increases it is likely that the increases are not related to the pond. Further discussion of a possible leak in the Leachate Pond is provided in Section 7.2. These observations will continue to be evaluated in future monitoring events.

Concentrations of inorganic parameters in downgradient wells along the eastern City Facility boundary (MW-3 and MW-4) were comparatively low. In well MW-3, fluctuating trends in some parameters (including conductivity/TDS, chloride, nitrate, sulfate, and dissolved cations (magnesium, potassium, and sodium) have been observed; concentrations increased between 2011 and 2016, decreased again until 2019, and have since stabilized, although slight increases in conductivity/TDS, alkalinity, and dissolved cations were observed in the third and fourth quarters of 2025.

Concentrations of these parameters in MW-4 increased between 2008 and 2013, decreased until 2019 and then stabilized, although slight increases have been observed over the past few years. It is

not possible to determine if these trends represent natural changes in local groundwater or landfill impacts, since the upgradient wells have shown area-wide impacts by outside sources.

TOC concentrations in most upgradient and downgradient wells were elevated in the third and fourth quarters of 2025. Spikes in TOC have been previously observed historically and may potentially be related to outside factors such as sample handling or laboratory procedures.

4.4.2.2 Upgradient

In upgradient well MW-1, concentrations of some parameters (including alkalinity, calcium, chloride, magnesium, nitrate, potassium, sodium, sulfate, TOC, TDS, and conductivity) began increasing in 2000 but stabilized over approximately 20 years. Recent TOC spikes were observed in 2024 and during the third and fourth quarters of 2025.

In upgradient well MW-11, concentrations of conductivity and TDS and some inorganic parameters (including calcium, chloride, magnesium, and sulfate) began increasing in 2013 but stabilized over the past approximately 9 years. Nitrate and TOC concentrations have continued to slowly increase.

In cross-gradient well MW-2, located in the northeastern corner of the City Facility, conductivity and TDS and the concentrations of some inorganic parameters (calcium, chloride, magnesium, potassium, nitrate, sodium, and sulfate) were higher than observed historically beginning in the third quarter of 2008, although concentrations began decreasing again in 2013. Some recent increases in calcium, conductivity, nitrate, magnesium, and sodium have been observed; however, these concentrations are within historical ranges.

4.4.2.3 City Property

In well MW-12, located further downgradient on City Property, concentrations of inorganic parameters were generally between the range of wells MW-3 and MW-4. Slight increases in some parameters (arsenic, calcium, dissolved oxygen, magnesium, nitrate, and TDS) have been observed since the well was installed in 2018.

4.5 Sen's Slope Plots and Mann-Kendall Tests

Trends in the groundwater data were evaluated using the Mann-Kendall test for trend and Sen's nonparametric estimator of slope (EPA 2009) with the Sanitas™ software (Sanitas Technologies 2025). These tests are well suited to environmental data because there are no distributional assumptions, and missing data (non-detects) or irregularly spaced measurement periods are permitted. The Mann-Kendall test was used to identify whether a trend exists, and then the Sen's slope test was used to determine how steeply the concentration levels are changing.

The nonparametric Mann-Kendall test evaluates the significance of temporal trends at the 95 percent confidence level. A negative value for the Mann Kendall S statistic implies that a majority of the differences between earlier and later values are negative, suggestive of a decreasing trend. An S value near zero indicates a roughly equal number of positive and negative differences. This would be expected if the measurements were randomly fluctuating about a constant mean with no apparent trend.

The Sen's slope test is a nonparametric procedure used to estimate the true slope of the data. The advantage of the Sen's slope test over linear regression methods is that it is not greatly affected by gross data errors or outliers and can be computed when data are missing.

Sen's slope and Mann Kendall tests were analyzed for VOCs (Appendix D) using data for the past 10 years (first quarter 2016 through fourth quarter 2025) and 5 years (first quarter 2021 through fourth quarter 2025). In addition, 2-year trends were analyzed for wells and parameters that had increasing 5-year trends. A summary of statistically significant trends in parameter concentrations for VOCs is presented in Table 4-1. Only well/parameter cases with greater than 50 percent non-detected values were included in the trend evaluations.

Table 4-1. Statistically Significant Trends in Volatile Organic Compounds Calculated Using the Sen's Slope and Mann-Kendall Test

Parameter	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-8	MW-9	MW-10	MW-11	MW-12 ¹
Past 10 Years 1Q2016-4Q2025											
1,1-DCA					↓	↓		↓	↓		
1,2-DCA					↓	↓			↓		
1,2-Dichloropropane					↓	↓					
Benzene						↓					
Chloroform			↑					↑	↓		
cis-1,2-DCE				↑	↓	↓					
PCE	↑				↓	↓			↓		
trans-1,2-DCE					↓	↓					
TCE				↑	↓	↓					
Vinyl Chloride (VC)					↓	↓			↓		
Past 5 Years 1Q2021-4Q2025											
1,1-DCA				↓	↓	↓		↓	↓		
1,2-DCA					↓	↓					
1,2-Dichloropropane					↓						
Benzene						↓					
Chloroform									↓		
cis-1,2-DCE					↓	↓		↓	↓		
PCE				↑	↓	↓		↓	↓		
trans-1,2-DCE						↓					
TCE				↑	↓	↓			↓		
Trichlorofluoromethane				↓							
Vinyl Chloride (VC)						↓					
Past 2 Years 1Q2024-4Q2025*											
PCE				↑							
TCE				NS							

↑ = Statistically significant increasing trend (positive Mann-Kendall and Sen's slope)

↓ = Statistically significant decreasing trend (negative Mann-Kendall and Sen's slope)

↑ or ↓ = Significant trend observed consistently for both past 5 years and past 10 years

NS = Not significant

*2-year trends were analyzed for well/parameter cases with statistically significant increasing trends over the past 5 years

¹ Data for MW-12 available beginning in 2018; 10-year trends were not calculated

4.5.1 Volatile Organic Compounds

4.5.1.1 Upgradient

Upgradient well MW-1 showed a statistically significant increasing trend for PCE over the past 10 years, but the trend was not present over the past 5 years.

4.5.1.2 Adjacent to Old Landfill

As shown in Table 4-1, a number of VOCs in wells located adjacent to the Old Landfill (MW-5, MW-6, and MW-10) showed statistically significant decreasing trends over both the past 5 and 10 years, suggesting that the 2011 Old Landfill Phase 1 closure, 2023 Old Landfill Phase 2 closure, and LFG extraction system operations are having an overall positive effect by removing the source of contaminants to groundwater. These include 1,1-DCA and PCE in wells MW-5, MW-6, and MW-10; 1,2-dichloropropane in well MW-5; benzene, trans-1,2-DCE, and VC in well MW-6; chloroform in well MW-10; and chlorinated ethenes in wells MW-5 and MW-6 (cis-1,2-DCE, EDC and TCE).

Additional decreasing trends are anticipated due to the 2023 Old Landfill Phase 2 closure. However, some of the decreasing 10-year trends observed in MW-10 (1,2-DCA, benzene, PCE, VC) were no longer present over the past 5 years, indicating the concentrations of these parameters may be stabilizing.

4.5.1.3 City Facility Boundary

Wells along the City Facility boundary (MW-4 and MW-9) showed statistically significant increasing trends in some VOCs for both the past 5 and 10 years (TCE in well MW-4; chloroform in well MW-9). A new 5-year increasing trend was observed for PCE in MW-4 beginning in the second quarter of 2025, and, in the fourth quarter of 2025, a 2-year increasing trend was observed. Although these wells are downgradient of the current fill area (Figure 1-2), the increasing trends are believed to be related to the Old Landfill.

However, other data indicate that concentrations of some VOCs in wells located along the City Facility boundary may be stabilizing. As noted in Section 4.4.1 above, concentrations of TCE in MW-4 appear to be stabilizing, and some of the 10-year increasing trends were no longer present over the past 5 years (chloroform in well MW-3; cis-1,2-DCE in MW-4). 1,1-DCA in well MW-4 previously had a 10-year upward trend through the second quarter of 2025 and is now showing a 5-year downward trend.

In MW-9, new decreasing 5-year trends were observed for PCE beginning in the second quarter of 2025 and for cis-1,2-DCE beginning in the third quarter of 2025. The previously observed increasing trend for chloroform in MW-9 was no longer observed in the fourth quarter of 2025.

Overall, these may be signs of success of contaminant source removal related to the Old Landfill LFG collection system. Trends will be further evaluated in the final RI Report in accordance with the RI Work Plan Addendum (Parametrix 2024).

4.5.1.4 City Property

The previously observed statistically significant increasing 5-year trend for cis-1,2-DCE in well MW-12 located on City Property beyond the City Facility boundary has not been present since the second quarter of 2024, indicating the concentrations may be stabilizing. Due to the low groundwater flow

rates (see Section 5), VOC detections in well MW-12 likely reflect LFG impacts occurring prior to remediation efforts.

4.6 Background Statistics

Background statistics (i.e., mean, variance, standard deviation, coefficient of variation, and standard error) for upgradient wells MW-1 and MW-11 are presented in Appendix E in accordance with WAC 173-351-420(1). Variations in concentrations within the upgradient wells are presented in the time-series plots discussed in Section 4.4.

4.7 Natural Attenuation Parameters

Analysis and measurement of additional parameters (dissolved methane, ethane, ethene, dissolved oxygen [DO], and oxidation-reduction potential [ORP]) are being performed to evaluate whether VOCs are degrading through either biological or chemical processes (Shaw Environmental, Inc. 2003). Natural attenuation of VOCs would be indicated by elevated concentrations of ethene or ethane and decreases in DO and ORP (EPA 1998).

Some of the 2025 data (Table A-1) indicate that natural attenuation is likely occurring. DO measurements show anaerobic conditions in downgradient wells MW-5, MW-6, and MW-10 adjacent to the Old Landfill Phase 2 closure (less than 1 mg/L) and some ORP measurements were also lower. The anaerobic conditions are favorable for reductive dechlorination of more highly chlorinated compounds (PCE and TCE) which have shown significant decreases in concentrations over the past 10 years (see Table 4-1).

Quantitative analysis of other evidence for reductive dechlorination is inconclusive. The high nitrate concentrations contributed by an upgradient source as demonstrated at well MW-11 would tend to inhibit reductive dechlorination reactions for more highly chlorinated compounds (PCE and TCE), and the high sulfate concentrations would inhibit reductive dechlorination of lower chlorinated compounds (DCE and VC). The low concentrations of iron and TOC throughout the Site are also unfavorable for reductive dechlorination. Methane is contributed directly by LFG and no ethane or ethene were detected in any of the wells.

Higher DO was measured in upgradient wells (between about 5 and 7 mg/L), and ORP measurements generally followed this pattern with more positive values observed in wells with higher DO. In the downgradient wells, DO measurements were higher and ORP measurements were more positive along the City Facility boundary than in the wells adjacent to the Old Landfill Phase 2 Closure. The relatively higher DO and ORP in wells along the City Facility boundary compared to the wells along the edge of the Old Landfill Phase 2 closure indicates a more aerobic environment which could support degradation of cis-1,2-DCE and VC, and the significantly lower concentrations or non-detections in VC in wells at the City Facility boundary provide evidence that degradation of VC is occurring.

Trends in other parameters that might indicate that biodegradation is occurring (EPA 1998, Jurgens et al 2009), such as increases in chloride and alkalinity, or decreases in nitrate and sulfate, are somewhat ambiguous because concentrations of these parameters have been affected by contributions from upgradient sources.

Dissolved methane continued to be detected in downgradient wells adjacent to the Old Landfill Phase 2 closure: MW-5 (0.0724 to 0.193 mg/L), MW-6 (0.0127 to 0.165 mg/L), and

MW-10 (0.163 to 1.71 mg/L), but concentrations have been decreasing in all three wells. The occurrence of higher concentrations of dissolved methane in the wells with the highest concentrations of VOCs continues to support the hypothesis that LFG generated by the decomposition of solid waste within the Old Landfill is the primary source and transport mechanism for the VOCs impacting groundwater (Shaw Environmental, Inc. 2003).

4.8 Geochemical Evaluation

The geochemical evaluation (Appendix F) included preparing trilinear and Stiff diagrams to illustrate major ion geochemistry and calculating cation/anion balances.

4.8.1 Trilinear and Stiff Diagrams

Trilinear and Stiff diagrams are presented for 2025 and all the trilinear diagrams include the first quarter 2025 data from the New Landfill Leachate Pond.

The trilinear and Stiff diagrams indicate that in most of the wells the dominant anion was bicarbonate and the dominant cation was calcium followed by magnesium. However, as typically observed, the proportions of sulfate and chloride with respect to bicarbonate were higher in upgradient well MW-11 and to a lesser extent in some of the downgradient wells including MW-2, MW-6, and MW-8.

In the Leachate Pond, the dominant anion was chloride followed by bicarbonate, and the dominant cation was sodium followed by magnesium. Compared to the groundwater wells, the Leachate Pond's geochemistry had a higher proportion of the anion chloride and a higher proportion of cations sodium and potassium.

4.8.2 Cation/Anion Balance Calculations

Cation/anion balance calculations for 2025 are presented in Appendix F. All monitoring wells were within the acceptable range except for well MW-11 during the first quarter.

As stated in WAC 173-351-430-5(a), charge balance differences of greater than 5 to 10 percent (5 percent for cation/anion sums of greater than 5 milliequivalents per liter) could indicate laboratory error, poor well conditions, or other ions not accounted for in natural or impacted groundwater conditions. Charge balance differences greater than 5 to 10 percent have periodically been observed in the monitoring wells. Actions taken to improve charge balance differences beginning in 2007 consisted of changing analytical laboratories and reviewing quality assurance records provided by the laboratory to monitor data quality.

5. Groundwater Flow Direction and Rate

Groundwater elevations and potentiometric surface maps for 2025 are presented in Appendix G. The groundwater flow direction continued to be toward the southeast in the northern and southern portions of the City Facility but was easterly in the central portion of the City Facility. Although the overall historical flow direction has ranged from easterly to southeasterly, flow in the central portion of the City Facility has been more easterly over the past few years. Some influences from upgradient and/or on-site sources of recharge have affected the groundwater gradient across the City Facility (see Section 2.3).

The average groundwater flow velocity for 2025 is calculated to be low, ranging from 0.002 to 0.04 ft/day or 0.8 to 20 ft/year, based on the measured groundwater gradients in the vicinity of well MW-6 (0.0004 to 0.0007 ft/ft), hydraulic conductivity values of 2 to 15 ft/day (Shaw Environmental, Inc. 2003; Shannon & Wilson 1998), and estimated porosities between 20 and 35 percent (Walton 1985). However, nearby evaluations of flow within the Ringold Formation at the Hanford site have shown higher average hydraulic conductivities (U.S. DOE 2009) indicating average horizontal flow velocities at the City Facility may be underestimated.

Beginning in 2014, groundwater monitoring has indicated groundwater mounding is occurring beneath the western portion of the City Facility immediately downgradient of the ORV park and is believed to be related to groundwater recharge from precipitation/infiltration related to the Old Landfill, the neighboring facility, or crop circle irrigation further to the west and northwest. The mounding appears to steepen the groundwater gradient on the northwest portion of the City Facility and shift flow slightly toward the south-southeast.

Due to the slow rate of calculated groundwater flow due (less than 20 ft/year), it is difficult to trace the path and timing of specific contributions of recharge containing contaminants added from upgradient sources, but it is known that the ORV park to the west of the facility has irrigation and septic systems, and there are irrigated crop circles further to the northwest that could contribute seasonal pulses of water.

Groundwater levels generally followed the seasonal pattern of precipitation up through approximately 2016 (Figure G-5). Groundwater levels were relatively flat between 2016 and 2019 during a period of increasing precipitation. In 2019, a spike was observed in wells MW-5, MW-6, and MW-10 that has been sustained in MW-10. Since 2019, groundwater levels in all wells have increased during a period of decreased precipitation. The fourth quarter of 2024 and first quarter of 2025 were excessively wet with over 7 inches of precipitation between November and March (NOAA 2025) and water levels appear to have peaked during the second quarter. A decrease occurred in the third quarter along with decreasing precipitation followed by an increase in the fourth quarter.

6. Landfill Gas Monitoring

LFG was measured by City personnel at thirteen LFG monitoring probes (Figure 1-3) and the data are presented in Appendix H. Gas probes GP-1 through GP-4 and GP-7 through GP-11 are screened at two subsurface intervals, and GP-12 is screened at three separate intervals, including one deep probe just above groundwater. The data include measurements collected from three single-completion LFG probes (GP-13, GP-14, and GP-15) that were installed in June 2021 (Parametrix 2021b) to monitor Phase 1 of the New Landfill. These gas probes are completed in alluvium outside the New Landfill.

6.1 Landfill Gas Data

The 2025 methane concentrations were less than 5 percent by volume. The extent of LFG migration remains in close proximity to the perimeter of the Old Landfill and concentrations have not exceeded the 5 percent by volume regulatory action limit at the City Facility boundary.

6.2 Historical Landfill Gas Data Trends

Methane trends in the probes where methane has historically been observed (GP-2, GP-9, and GP-12) are shown in Figure 7-1. The data indicate that despite limited spikes, overall substantial decreases have been observed since the closure activities started in 2011 that included installation and operation of an active LFG control system. Methane concentrations in GP-2 and GP-12 have decreased from 35 to 45 percent by volume prior to the 2011 Old Landfill Phase 1 to 0.0 percent since 2024.

Methane concentrations in GP-12-1 showed a temporary increase beginning in the second quarter of 2023 but have since decreased. GP-12-1 is the shallowest probe at that location, with its screen extending to a depth of 2.5 ft below the bottom of waste (approximately 62 ft above the water table). The temporary increases observed at GP-12-1 were likely related to the placement of the cover in Phase 2 of the Old Landfill and ensuing LFG buildup prior to the beginning of gas extraction that was initiated in late July 2023.

Methane concentrations in GP-12-3 have been significantly reduced since the Old Landfill Phase 1 closure, from typical concentrations of 15 to 25 percent, to generally less than 1 percent. This probe is notable because its screened interval extends to approximately 8 ft above the water table (56.5 ft below the top of waste). Beginning in 2024, methane concentrations measured at GP-12-3 have been near zero.

New gas probes GP-13, GP-14, and GP-15 that monitor Phase 1 of the New Landfill have not detected methane above background concentrations since installation in 2021.

6.3 Landfill Gas System Changes

Figure 1-3 shows the LFG controls on the Old Landfill. As discussed above, the Old Landfill Phase 2 LFG controls were activated in July 2023. The first LFG controls on the New Landfill were installed in the first quarter of 2024 and consist of three horizontal (east-west oriented) perforated pipe trenches installed into the waste. These trenches are connected to the gas control system but have not been activated at this time due to the lack of gas present. Upon presence of landfill gas in the trenches this portion of the gas control system will be activated. A renewable natural gas (RNG) plant

has been constructed west of the flare station near the center of the City Facility (see Figure 1-1). The RNG plant was activated in December 2023 (Pine Creek 2023). Typical gas control system operation routes all LFG to the RNG plant with the City's flare as a backup control measure. In the event of a shutdown of the RNG plant an automated control valve routes gas to the flare until normal operation of the RNG is restored. Future gas generation is expected to exceed the capacity of the RNG plant, and upon reaching this threshold the automatic control valve will modulate flow to both the RNG plant and the City flare to create sufficient capacity to maintain control of the LFG.

Gas probe GP-12 was located within or near the future waste footprint of the New Landfill Phase 2. In March 2025, the City decommissioned GP-12 and replaced it with gas probe GP-12R located adjacent to MW-6 (Parametrix 2025e).

7. Leachate Monitoring

7.1 Old Landfill Vadose Zone Monitoring

Leachate is collected annually during the third quarter from four lysimeters that monitor the vadose zone directly beneath the MSW located in the northeast corner of the Old Landfill. Drains from each lysimeter are connected to a common sampling vault where discrete samples of leachate are collected from four sampling ports. The approximate location of the lysimeters and sampling vault are identified in Figure 1-4. Samples from the four vadose monitoring ports are to be analyzed for leachate parameters listed in Appendix I and II of WAC 173-351-990.

The leachate ports of the Old Landfill were checked in the third quarter and none of the ports contained sufficient volume of liquid to collect a sample to be tested for VOCs.

7.2 New Landfill Phase 1 Leachate Pond

Leachate from the New Landfill Phase 1 is gravity drained from the lined cell into the double lined leachate storage and evaporation pond (LP1). The lowest point of the primary pond liner is approximately 9 ft above the water table at that location. It was originally designed to have 10 feet of separation; however, the groundwater levels have increased since the construction of the pond.

The ground surface elevation at LP1 is approximately 406 ft NAVD88. The inlet pipe from the New Landfill to LP1 is at an elevation of 402 ft NAVD88 and the primary liner bottom elevation is at an elevation of 396 ft NAVD88. LP1 was designed to have 18 inches of free board for a maximum water pond water level of 404.5 ft NAVD88. The secondary liner of the pond is currently approximately 8 - 8.25 ft above the water table which occurs at approximately 386.75 - 387 ft NAVD88 (see Appendix G).

LP2 was constructed east of LP1. A diversion valve was installed between the leachate collection pipe in the landfill and LP1 to allow leachate to be routed to either LP1 or LP2. Additional pipe was installed for transfer from LP1 or its leak detection sump over to the LP2, which occurred following the fourth quarter event.

7.2.1 Pond Level Monitoring and Actions Taken

The LP1 leak detection sump (leachate underdrain) between the liners is checked quarterly for the presence of liquid and the water level of the pond is recorded on the field data sheet. In the case that liquid is detected in the leak detection sump, samples may be collected to compare the results with those of the leachate in the pond. The liquid level and leak detection sump for the Condensate Evaporation Pond near the flare facility are similarly checked quarterly and recorded on field sheets.

7.2.1.1 Leachate Pond

The Landfill experienced a rapid runoff event in late January/early February 2024 and pond levels were observed up into the designed free board (18 inches) of the pond. In April 2024, liquid was detected in the LP1 leak detection sump at a level comparable to levels within LP1.

The leak detection sump was subsequently evacuated by the City but liquid continued to accumulate at levels comparable to the height of water within LP1 but below the inlet piping, suggesting a potential leak in the primary pond liner. Since that time, the City has actively monitored the level of

liquid within LP1 to ensure the leachate remains in containment of the primary liner and removed liquid from the Leachate Sump to mitigate risk of any additional leachate from collecting in annular space between the primary and secondary liner. Since beginning regular evacuation of the underdrain, the volume of liquid in the underdrain has decreased and during the second quarter event, the City noted that recent pumping at the sump had removed all liquid to dryness after approximately 2 to 3 minutes of pumping at a low rate.

Prior to the third quarter event, construction of LP2 began and construction activities removed access to LP1. Access was restored in December 2025, and at the time of the fourth quarter monitoring event, the LP1 leak detection sump was observed to have approximately 5.5 feet of water while the pond level was at 7.5 feet. LP2 is currently undergoing CQA and is inactive. Monitoring of the LP2 sump and pond level will begin once the pond becomes active.

Ecology (2025) recommended that the BFHD require an electrical leak detection test (ASTM D7007) of the primary and secondary pond liners to confirm if a leak is present and determine its location. The City has agreed to work with BFHD to schedule the test and to continue to expediate the construction of the new leachate pond (Richland 2025). Preparation for the leak detection testing is on-going with testing anticipated to occur in the first quarter or early second quarter of 2026.

7.2.1.2 Condensate Pond

The City evacuated the liquid in the leak detection sump following the second quarter due to the observation of approximately 3 feet of liquid. Minimal water (less than 0.3 feet) was observed in the third quarter. In the fourth quarter, approximately 3 feet of liquid was measured in the Condensate Pond leak detection sump while the pond level was at approximately 1 foot. Monitoring of the sump will continue, and the Condensate Pond will be analyzed for electrical leak detection when LP1 is analyzed.

7.2.2 Leachate Pond Sampling

The annual sampling of the LP1 was conducted during the first quarter. Samples were collected with a peristaltic pump and analyzed for Chapter 173-351 WAC Appendix I and II parameters and results were presented in the first quarter 2025 report (Parametrix 2025d). LP2 is currently undergoing CQA and is not active. Samples collected in 2026 will be from either LP1 or LP2 whichever pond is currently active.

7.2.2.1 Leachate Quality Comparison to Groundwater

Historical data for the LP1 leachate pond samples are presented on time-series plots in Appendix C-2 for comparison to the groundwater data. The LP1 samples have shown apparent increases in concentrations of some parameters since sampling was initiated in 2022, likely reflecting the increasing contributions of leachate compared to storm water runoff. Compared to the groundwater wells, concentrations of chloride, dissolved magnesium, TOC, and TDS were higher in the Leachate Pond, and dissolved calcium and sulfate were lower. Nitrate was relatively low in the Leachate Pond sample, although ammonia was higher than in groundwater. Acetone was the only VOC detected in the Leachate Pond sample, at an estimated concentration of 22.0 µg/L.

As discussed in Section 4.4.2, some leachate indicator parameters showed increases in well MW-10 beginning in the second quarter of 2024 (see Appendix C-3), and acetone was detected in the third quarter of 2024. Since MW-10 is located directly upgradient of LP1, it was suspected that the well may have potentially been affected by a leak in the primary pond liner (Parametrix 2025c). However, wells MW-5 and MW-6, located further from the Leachate Pond along the edge of the Old

Landfill, also showed increasing concentrations of leachate indicator parameters beginning in the second quarter of 2024.

In the fourth quarter of 2024, acetone was not detected in MW-10 but was detected in nearby wells MW-4 and MW-5. Although no acetone was detected in any of the wells in the first quarter, acetone was detected in the second quarter in wells MW-5, MW-6, MW-9, and MW-10, and in the third quarter in well MW-10. The evaluation of a potential release related to LP1 or other potential sources remains ongoing.

8. Conclusions and Recommendations

8.1 Conclusions

Environmental monitoring at the Facility was completed in accordance with Chapter 173-351 WAC related to active MSW landfill operations at the New Landfill and in accordance with MTCA related to historical releases related to the Old Landfill. The original RI determined that LFG is the likely source of the VOCs impacting groundwater (Shaw Environmental Inc. 2003, 2004) due to historical LFG releases from the unlined portions of the Old Landfill. The findings of the subsequent 2021 draft RI Report (Parametrix 2021) showed that exceedances of groundwater quality criteria are generally limited to within 500 ft of the City Facility boundary.

Although the overall historical flow direction has ranged from easterly to southeasterly, flow in the central portion of the City Facility has been more easterly over the past few years, potentially due to mounding effects of on-site stormwater infiltration, intermittent crop circle irrigation, and activities at a local ORV Park.

Ecology's comments on the draft RI Report (Ecology 2022) included the opinion that the extent of VOCs in groundwater is not fully delineated. This conclusion was based in part on the increasing trends in some VOCs observed over the past 5 years in wells MW-3 and MW-4 located along the eastern City Facility boundary, particularly in consideration of the more easterly flow direction observed over the past few years. The City developed an approach and 2-year timeframe for evaluating additional monitoring data to assess the effects of the interim remedial measures completed (Parametrix 2024). The 2025 data continued to show that VOCs have largely stabilized and/or are decreasing with limited exceptions.

Since 2011, the Old Landfill Phase 1 LFG collection system has been effective in removing much of the LFG within close proximity of the Old Landfill as demonstrated by the overall decreases in methane concentrations observed at multilevel gas probes GP-2 and GP-12, including GP-12-3, screened immediately above the water table. With completion of the Old Landfill Phase 2 closure in July 2023, the source of VOCs to groundwater has been further reduced as evidenced by the absence of methane at GP-12-3 since 2024. Methane has not been detected above background in new gas probes GP-13, GP-14, and GP-15 that monitor Phase 1 of the New Landfill. GP-12 was replaced in March 2025 with a new gas probe GP-12R located adjacent to MW-6, slightly closer to the Old Landfill, and will continue to be monitored. Methane concentrations in groundwater in wells adjacent to the Old Landfill have shown substantial decreases since completion of the Old Landfill Phase 2 closure.

Trend analyses indicate that the concentrations of VOCs in groundwater wells located near the Old Landfill have shown significant decreases over both the past 5 and 10 years, although some previous 10-year decreasing trends, especially in well MW-10, are no longer significant, indicating the downward trends in those wells may be stabilizing. The previously statistically significant increasing trends observed for some VOCs in wells located along the City Facility boundary (MW-3 and MW-4) and in well MW-12 further downgradient on City Property are no longer significant, suggesting VOC concentrations in these areas are stabilizing.

The trends in VOC concentrations suggest the LFG extraction system at the Old Landfill is reducing the concentration of contaminants reaching the water table and indicate progress during the 2-year period of evaluation (Parametrix 2024) that will enable completion of the FS. These findings are especially promising because the groundwater data reflect LFG impacts occurring prior to remediation efforts and it is expected to take time to observe the effects of remediation due to the

low groundwater flow rates (see Section 5). Evaluation of natural attenuation parameters such as DO and ORP measurements indicate that conditions in groundwater near the Old Landfill source are consistent with anaerobic conditions and attenuation of PCE and TCE, and more aerobic conditions are present further downgradient.

Although VOC concentrations have decreased, concentrations of inorganic parameters in the wells adjacent to the Old Landfill have shown recent increases. Concentrations in wells MW-5 and MW-10 stabilized throughout 2025 at elevated concentrations; however, concentrations in well MW-6 continued to increase and the fourth quarter 2025 concentrations of some parameters including conductivity/TDS and nitrate were the highest observed to date and above those measured in upgradient well MW-11. These observations will continue to be evaluated in future monitoring events and will be further analyzed in the final RI report.

There is a confirmed leak in the LP1 primary liner. Construction of LP2 was expedited to assist with leachate control starting in the wet season. New control valves and pipe were installed to allow for transfer between LP1 and LP2. LP2 construction is complete and leachate has been transferred from LP1 to LP2. Preparation for the leak detection testing is on-going with testing anticipated to occur in the first quarter or early second quarter of 2026. The City continues to periodically pump and remove liquid accumulated in the sump of LP1 to minimize the potential for leaks through the pond's secondary containment and will implement repairs of the primary liner and secondary liner after results of the leak testing.

A potential leak is also suspected in the primary liner of the Condensate Pond. The City pumped out the Condensate Pond leak detection sump following the second quarter event and less than 0.3 feet of liquid was measured in the third quarter. However, liquid was observed again in the fourth quarter. The Condensate Pond will be analyzed for electrical leak detection when pond LP1 is analyzed.

8.2 Recommendations

Ongoing groundwater monitoring will assess whether decreasing trends in VOCs are continuing to occur in downgradient wells, reflecting attenuation of existing VOC contamination related to historical releases from the Old Landfill. To this end, the statistical evaluation for groundwater data will continue to consist of evaluating groundwater time series plots, updating groundwater trend analyses, and updating plots of methane measurements in the LFG probes. Trends in VOC concentrations will be evaluated in the final RI Report in accordance with the RI Work Plan Addendum (Parametrix 2024).

The City should continue leachate management control measures and use LP2 until the LP1 primary liner leak can be detected and repaired. The Condensate Pond is suspected to have a potential leak in the primary liner and should also be tested during the leak detection survey of LP1.

Since the recent groundwater data from monitoring wells MW-5, MW-6, and MW-10 (closest to LP1) that are immediately downgradient from the Old Landfill have indicated increases in leachate indicator parameters, the City should continue evaluating quarterly monitoring data to confirm that the interim actions at the LP1 have been successful in removing it as a potential contaminant source and to evaluate other potential contaminant sources. These trends and potential sources of the contaminants will be further evaluated in the final RI Report.

Following the completion of the final RI Report, a FS report will be prepared in accordance with the MTCA Agreed Order that focuses on the Old Landfill Phase 2 closure including installation of the landfill cover and activation of the LFG extraction system completed in July 2023 as the likely cleanup remedy. The closure is expected to continue reducing the source of VOCs to groundwater and address the previously increasing trends observed in wells near the City Facility boundary.

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Figures

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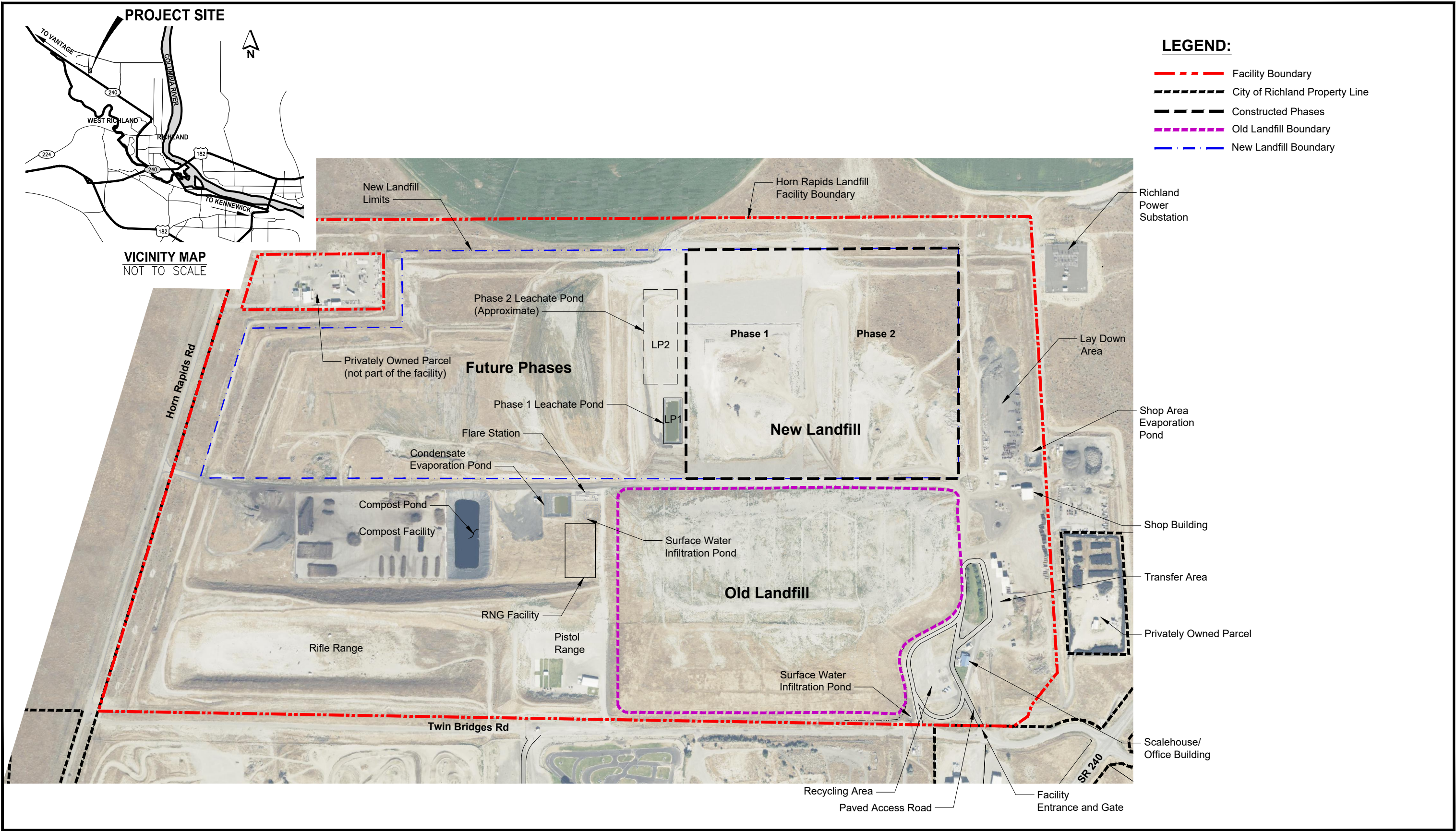
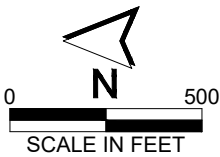


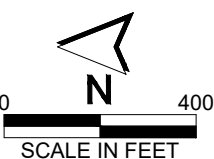
Figure 1-1
Horn Rapids Landfill
Facility Plan

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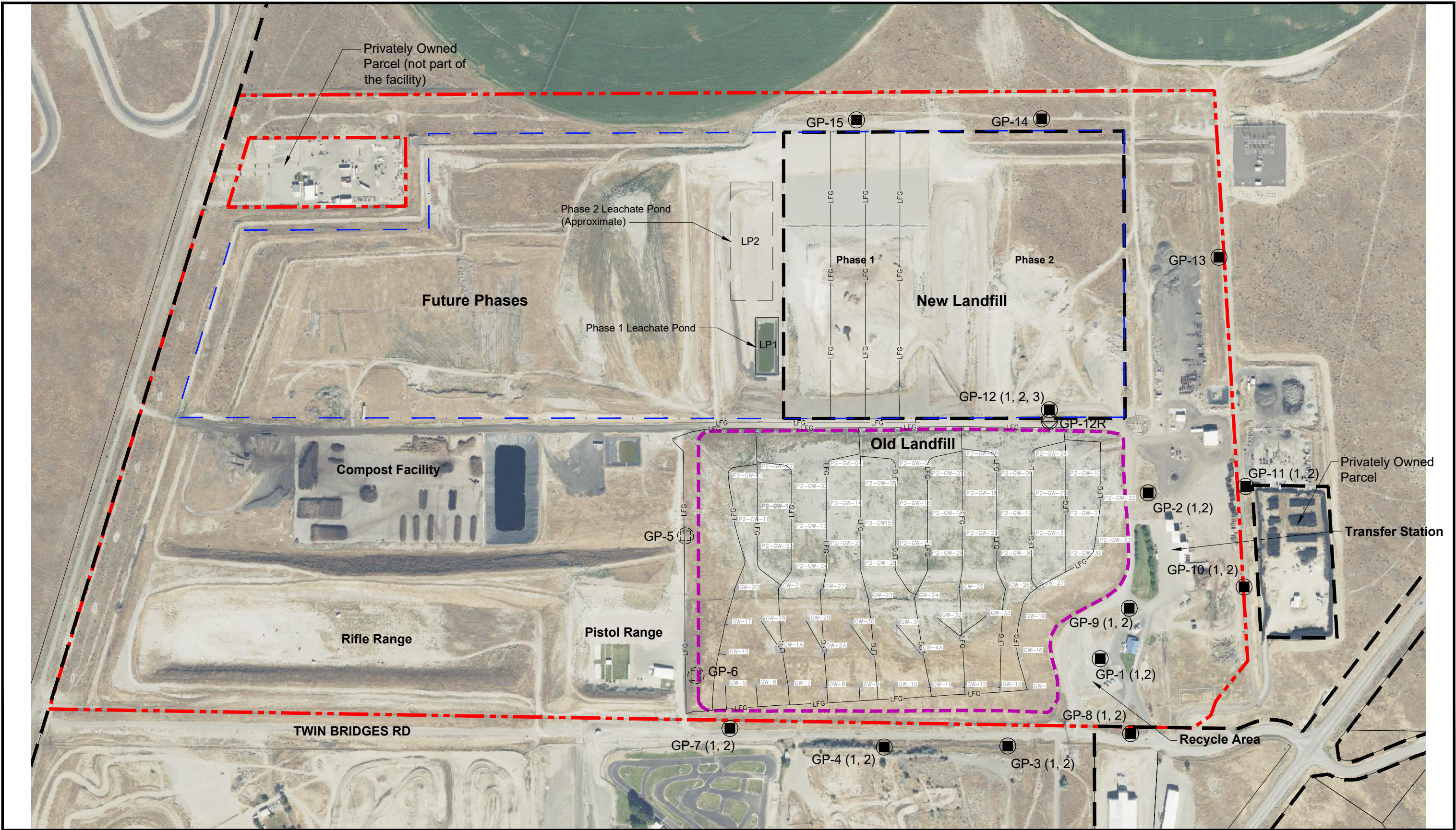
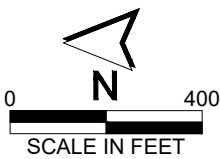
Legend:

- Existing Groundwater Monitoring Well
- Decommissioned Groundwater Monitoring Well

- Facility Boundary
- City of Richland Property Line

- Constructed Phases
- Old Landfill Boundary
- New Landfill Boundary

Figure 1-2
Groundwater Monitoring Well
Locations
Horn Rapids Landfill

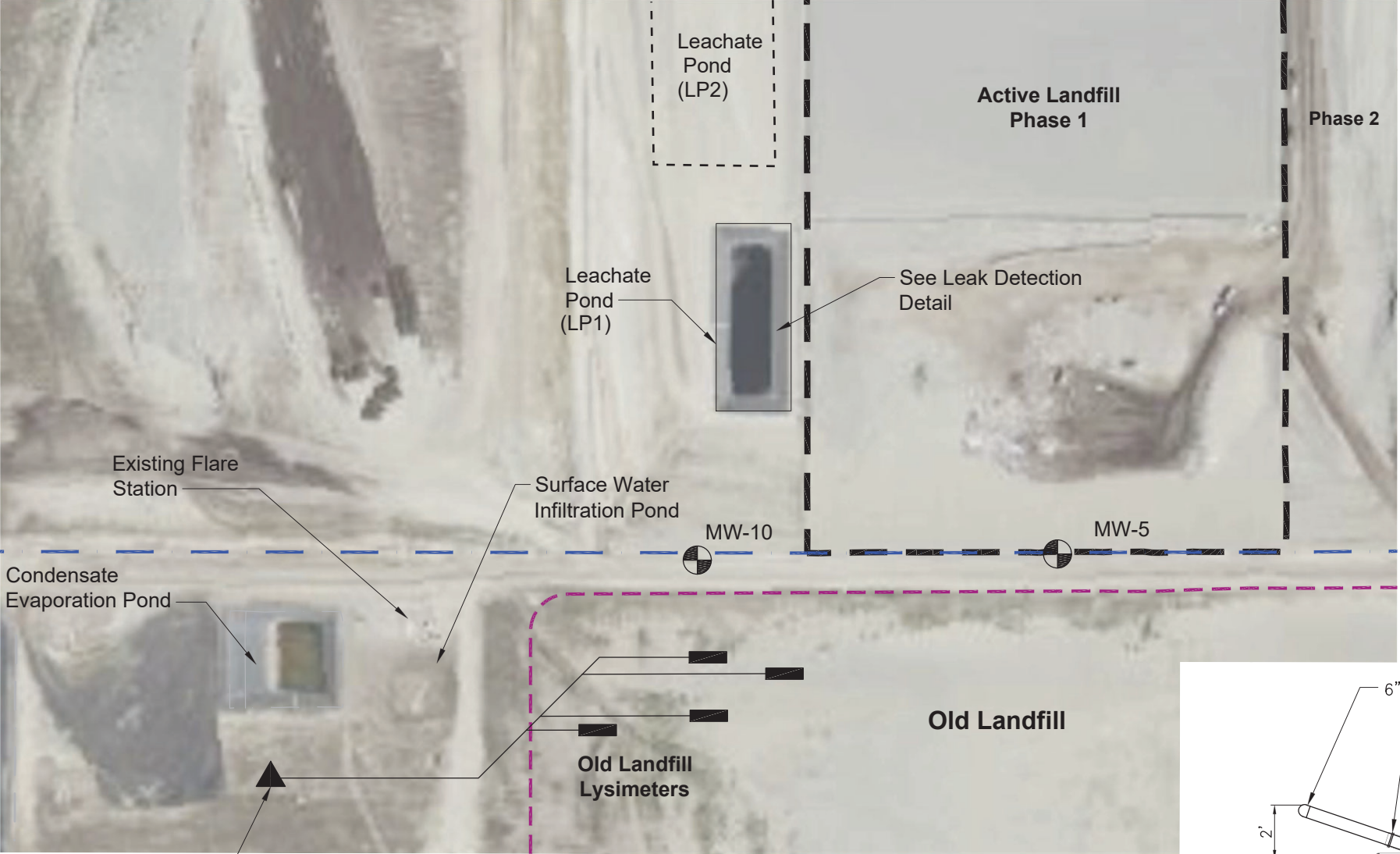


LEGEND:

- | | | | | | |
|--|--------------------------|--|--------------------------------|--|-----------------------|
| | Proposed Gas Probe | | LFG Control System | | Constructed Phases |
| | Existing Gas Probe | | Facility Boundary | | Old Landfill Boundary |
| | Decommissioned Gas Probe | | City of Richland Property Line | | New Landfill Boundary |
| | LFG Gas Extraction Wells | | | | |

Figure 1-3
Gas Probe and
Extraction Well Locations
Horn Rapids Landfill

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LEGEND:

- Existing Groundwater Monitoring Well
- Lysimeter Port
- Lysimeter
- Active Phase
- Old Landfill Boundary
- New Landfill Boundary

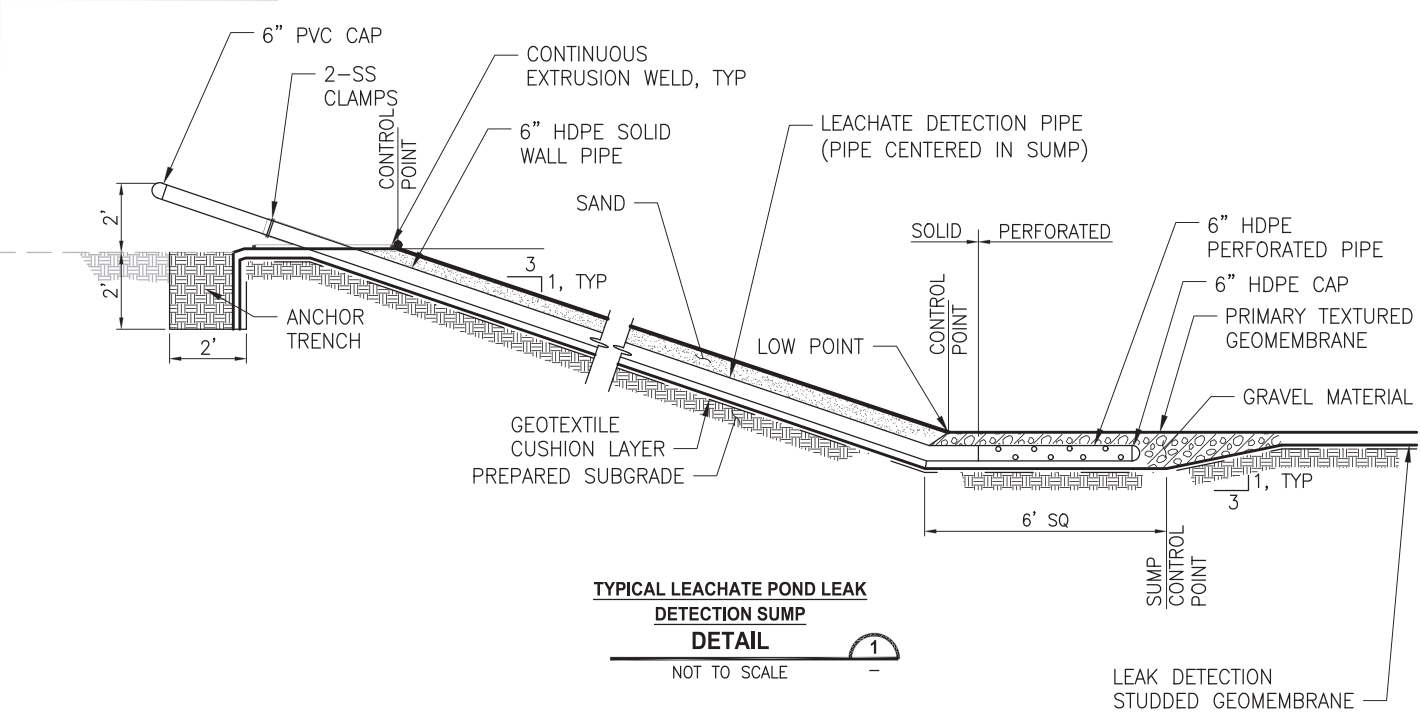
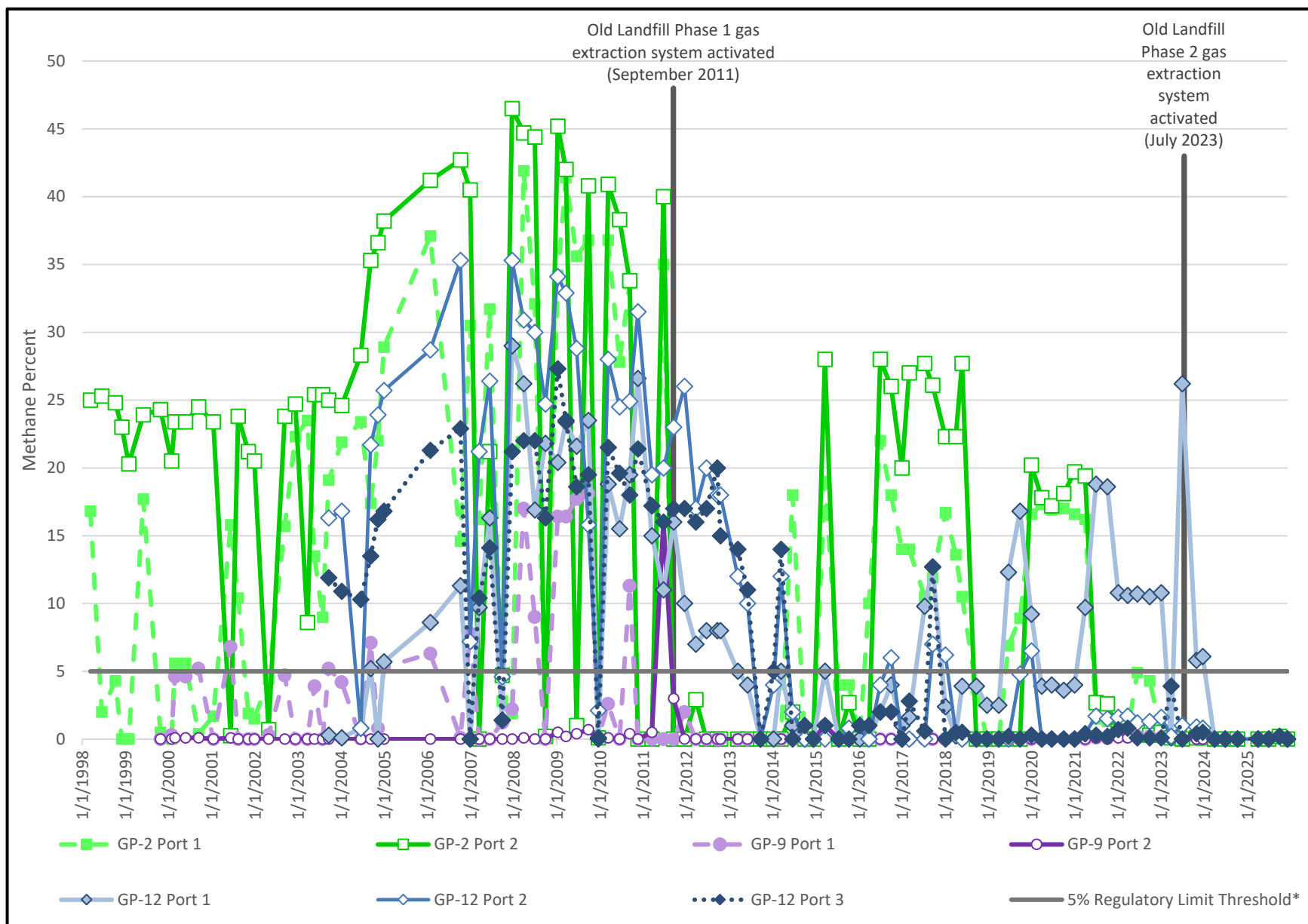


Figure 1-4
Leachate Management Details
Horn Rapids Landfill



Parametrix

*Chapter 173-351 WAC (Threshold for reference only, applies at City Facility Boundary)

Figure 7-1
Methane in Landfill Gas Probes,
Horn Rapids Landfill

Appendix A

Groundwater Quality Data Summary Tables

Table A-1. Groundwater Quality Monitoring Results
2025

Analyte	Units	GWQS	MCL	MW-1	MW-1	MW-1	MW-1	MW-2	MW-21	MW-2	MW-2	MW-2	MW-3	MW-3	MW-21	MW-3	MW-3	
				3/19/2025	6/25/2025	9/16/2025	12/8/2025	3/19/2025	(MW-2 Dup) 3/19/2025	6/26/2025	9/15/2025	12/9/2025	3/18/2025	6/25/2025	6/25/2025	(MW-3 Dup) 6/25/2025	9/15/2025	12/9/2025
FIELD DATA	pH	units	6.5-8.5	6.93	7.66	7.02	7.06	7.38	--	7.74	7.52	6.77	7.65	7.93	--	7.31	7.03	
	Conductivity	µmhos/cm	700 **	663	715	714	825	615	--	626	633	592	320.4	386.0	--	468.6	514	
	Temperature	C°		20.5	22.0	22.3	20.9	17.0	--	20.4	21.7	20.6	23.6	22.8	--	23.0	16.1	
	Redox	mv		-146.9	-50.1	42.8	167.2	-98.1	--	-59.3	113.0	174.6	-153.2	-99.8	--	92.1	160.5	
	Dissolved Oxygen	mg/L		5.23	5.59	7.37	8.05	6.48	--	6.35	9.28	8.47	6.76	7.15	--	10.25	11.21	
	Turbidity	NTU		0.65	0.62	NA	0.99	4.43	--	2.43	0.08	0.59	1.80	1.15	--	0.00	0.23	
WATER QUALITY PARAMETERS	Nitrate-Nitrogen	mg/L	10 *	10 *	5.8	6.67	6.91	6.28	18	18	17.8	17	14	2.4	2.55	2.68	2.41	1.97
	Calcium, Dissolved	mg/L			91.4	101	96.6	91.6	77.0	79.2	83.4	79.3	70.1	37.2	49.4	50.7	62.9	64.4
	Sodium, Dissolved	mg/L			21.7	22.2	22.9	22.3	14.7	15.1	15.6	15.8	14.0	11.3	12.9	13.3	15.5	15.2
	Bicarbonate Alkalinity	mg/L as CaCO3			280	282	281	268	124	125	119	120	124	112	137	142	186	207
	Chloride	mg/L	250 **	250 **	18.1	21.8	22.0	20.8	26.8	28.3	30.3	33.5	28.1	11.3	12.9	12.8	13.8	13.2
	Magnesium, Dissolved	mg/L			18.0	19.7	19.7	18.6	16.5	16.8	17.1	17.6	15.0	7.52	9.75	9.67	12.6	13.0
	Potassium, Dissolved	mg/L			7.46	7.38	7.56	7.59	6.54	6.72	6.60	6.66	6.30	5.35	5.89	5.98	6.99	7.00
	Sulfate	mg/L	250 **	250 **	44.2	44.9	44.8	45.2	74.1	74.0	79.9	77.5	65.8	27.5	27.6	27.3	27.6	27.1
	Total Alkalinity	mg/L as CaCO3			280	282	281	268	124	125	119	120	124	112	137	142	186	207
	Iron, Dissolved	mg/L	0.30 **	0.3 **	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
	Manganese, Dissolved	mg/L	0.05 **	0.05 **	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
	Ammonia-Nitrogen	mg/L as N			<0.040	0.047	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.058	<0.040
	Total Organic Carbon	mg/L			0.76	1.13	10.32	18.29	0.61	0.63	0.74	4.03	8.34	<0.50	<0.50 U	<0.50 U	5.30	13.05
	Total Dissolved Solids	mg/L	500 **	500 **	416	434	443	401	403	405	388	370	346	215	235	243	271	286
	Total Suspended Solids	mg/L			<1 UJ	<0.9	<2	<1	<2 UJ	<1 UJ	<1	<2	<1	<1 UJ	<1	0.9	<2	<1
METALS	Antimony, Total	mg/L		0.006 *	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.000400	<0.00100	<0.000400
	Arsenic, Total	mg/L	0.00005 ***	0.010 *	0.00430	0.00418	0.00404	0.00383	0.00369	0.00341	0.00320	0.00321	0.00336	0.00902	0.00822	0.00875	0.00824	0.00812
	Barium, Total	mg/L	1.0 *	2.0 *	0.0424	0.0519	0.0435	0.0390	0.0398	0.0413	0.0439	0.0384	0.0330	0.0178	0.0225	0.0245	0.0253	0.0268
	Beryllium, Total	mg/L		0.004 *	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.00100	<0.000400	<0.00100	<0.00100	<0.00100	<0.000400	<0.000400	<0.00100	<0.00100
	Cadmium, Total	mg/L	0.01 *	0.005 *	<0.000500	<0.000200	<0.000500	<0.000200	<0.000500	<0.000500	<0.000200	<0.000500	<0.000200	<0.000500	<0.000200	<0.000200	<0.000500	<0.000200
	Chromium, Total	mg/L	0.05 *	0.1 *	<0.0100	0.00348	<0.00500	0.00274	0.0167	0.0175	0.00969	0.00786	0.00891	<0.00500	<0.00250	0.00121	<0.00250	<0.00250
	Cobalt, Total	mg/L			0.0120	0.00553	0.00665	0.00329	<0.00100	<0.00100	0.000518	<0.00100	0.000462	<0.00100	<0.000400	<0.00100	<0.00100	<0.000400
	Copper, Total	mg/L	1.0 **	1.3 *AL	0.00265	0.00279	<0.00250	0.00956	<0.00250	<0.00250	<0.00100	<0.00250	0.00107	<0.00250	<0.00100	<0.00100	<0.00250	<0.00100
	Lead, Total	mg/L	0.05 *	0.015 *AL	<0.00100	0.00276	<0.00100	<0.000400	<0.00100	<0.00100	0.000900	<0.00100	<0.000400	<0.00100	<0.000400	<0.000400	<0.00100	<0.000400
	Nickel, Total	mg/L			<0.00250	0.00182	<0.00250	<0.00100	0.00624	0.00609	0.00767	0.00654	0.00610	<0.00250	<0.00100	<0.00100	<0.00250	<0.00100
	Selenium, Total	mg/L	0.01 *	0.05 *	<0.00500	<0.00200	<0.00500	<0.00200	<0.00500	<0.00500	0.00229	<0.00500	<0.00200	<0.00500	<0.00200	<0.00200	<0.00500	<0.00200
	Silver, Total	mg/L	0.05 *	0.1 **	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.000400	<0.00100	<0.000400
	Thallium, Total	mg/L		0.002 *	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.000400	<0.00100	<0.000400
	Vanadium, Total	mg/L			0.00864	0.00591	0.00799	0.00748	0.00954	0.00990	0.00634	0.00796	0.00905	0.0161	0.00996 J	0.0132 J	0.0124	0.0139
	Zinc, Total	mg/L	5.0 **	5.0 **	<0.0300	0.0219	<0.0300	<0.0120	<0.0300	<0.0300	<0.0120	<0.0300	<0.0120	<0.0300	<0.0120	<0.0120	<0.0300	<0.0120
	VOLATILE ORGANIC COMPOUNDS	1,1,1,2-Tetrachloroethane	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
		1,1,1-Trichloroethane	µg/L	200 *	200 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,2,2-Tetrachloroethane		µg/L			<0.20	<0.20	<0.20 UJ	<0.20	<0.20	<0.20	<0.20	<0.20 UJ	<0.20	<0.20	<0.20	<0.20 UJ	<0.20	
1,1,2-Trichloroethane		µg/L		5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
1,1-Dichloroethane		µg/L	1 ***		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Vinyl Acetate		µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
1,1-Dichloroethene		µg/L		7 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
2-Butanone		µg/L			<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	
1,2,3-Trichloropropane		µg/L			<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50 UJ	<0.50	
1,2-Dibromo-3-Chloropropane		µg/L		0.2 *	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
1,2-Dibromoethane		µg/L	0.001 ***	0.05 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
1,2-Dichlorobenzene		µg/L		600 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
1,2-Dichloroethane		µg/L	0.5 ***	5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
1,2-Dichloropropane		µg/L	0.6 ***	5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
1,4-Dichlorobenzene		µg/L	4 ***	75 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
2-Hexanone		µg/L			<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	
4-Methyl-2-pentanone		µg/L			<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	
Acetone		µg/L			<5.00	<5.00	<5.00	<5.00 UJ	<5.00	<5.00	<5.00	<5.00	<5.00 UJ	<5.00	<5.00	<5.00	<5.00	<5.00 UJ
Benzene		µg/L	1 ***	5 *	<0.20	<0.20	<0.20	&lt										

Table A-1. Groundwater Quality Monitoring Results
2025

Analyte	Units	GWQS	MCL	MW-1	MW-1	MW-1	MW-1	MW-2	MW-21	MW-2	MW-2	MW-2	MW-3	MW-3	MW-21	MW-3	MW-3
				3/19/2025	6/25/2025	9/16/2025	12/8/2025	3/19/2025	(MW-2 Dup) 3/19/2025	6/26/2025	9/15/2025	12/9/2025	3/18/2025	6/25/2025	6/25/2025	9/15/2025	12/9/2025
VOLATILE ORGANIC COMPOUNDS (Cont.)	Chloromethane	µg/L		<0.50	<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50	<0.50 UJ
	cis-1,2-Dichloroethene	µg/L	70 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	cis-1,3-Dichloropropene	µg/L		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Dibromochloromethane	µg/L	80 * THM	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Dibromomethane	µg/L		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Ethylbenzene	µg/L	700 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Iodomethane	µg/L		<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	Methylene Chloride	µg/L	5 *** 5 *	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	m,p-Xylene	µg/L		<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
	o-Xylene	µg/L		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Styrene	µg/L	100 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Tetrachloroethene	µg/L	0.8 *** 5 *	4.64	5.34	4.23	5.15	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Toluene	µg/L	1000 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.33	<0.20	<0.20	<0.20	<0.20
	trans-1,2-Dichloroethene	µg/L	100 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	trans-1,3-Dichloropropene	µg/L		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	trans-1,4-Dichloro-2-butene	µg/L		<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	Trichloroethene	µg/L	3 *** 5 *	0.26	0.29	0.22	0.26	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Trichlorofluoromethane	µg/L		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	<0.20	0.23
	Vinyl Chloride	µg/L	0.02 *** 2 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Acrylonitrile	µg/L	0.07 ***	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
NATURAL ATTENUATION PARAMETERS	Ethane	µg/L		<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12
	Ethene	µg/L		<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14
	Methane	µg/L		<0.65	<0.65	<1.31	<1.31	<0.65	<0.65	<0.65	<1.31	<1.31	<0.65	<0.65	<0.65	<1.31	<1.31
	Acetylene	µg/L		<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06

Notes:

GWQS = Water Quality Standards for Ground Waters of the State of Washington (Chapter 173-200 WAC)

MCL = Maximum Contaminant Level, State Drinking Water Regulations (Chapter 246-290 WAC)

* = Primary

** = Secondary

*** = Carcinogen

*AL = Action level (Chapter 246-290 WAC)

*THM = Primary MCL for the sum of all trihalomethanes

*XYL = Primary MCL for the sum of all xylenes

Bold = Does not meet GWQS or MCL

-- = Not analyzed

H = Estimated value; analyzed beyond specified holding time

J = Estimated value

J- = Estimated value, biased low

R = Rejected value

U = Undetected value

Table A-1. Groundwater Quality Monitoring Results
2025

					MW-4	MW-4	MW-4	MW-21	MW-4	MW-5	MW-5	MW-5	MW-5	MW-21	MW-6	MW-6	MW-6	MW-6	
Analyte	Units		GWQS	MCL	3/19/2025	6/25/2025	9/15/2025	(MW-4 Dup) 9/15/2025	12/9/2025	3/19/2025	6/25/2025	9/16/2025	12/8/2025	(MW-5 Dup) 12/8/2025	3/19/2025	6/25/2025	9/16/2025	12/8/2025	
FIELD DATA	pH	units	6.5-8.5		7.29	7.95	7.40	--	6.90	6.23	6.90	6.02 R	6.40	--	6.17	6.97	5.90 R	6.31	
	Conductivity	µmhos/cm		700 **	656	656	672	--	680	1446	2067	1768	2071	--	1654	2412	2751	3644	
	Temperature	C°			19.9	22.5	21.9	--	19.5	24.2	25.8	25.0	24.6	--	23.4	25.3	26.4	24.9	
	Redox	mv			-152.5	-116.8	85.0	--	153.1	-177.4	-125.4	19.6	152.8	--	-178.1	-119.9	33.6	158.3	
	Dissolved Oxygen	mg/L			3.62	3.71	5.74	--	6.39	0.25	0.38	0.41	0.66	--	0.38	0.26	0.26	0.37	
	Turbidity	NTU			0.55	0.66	NA	--	0.23	0.68	0.64	NA	0.53	--	1.47	0.65	NA	1.03	
WATER QUALITY PARAMETERS	Nitrate-Nitrogen	mg/L	10 *	10 *	11	11.1	11.5	11.4	11.4	1.8	1.15	1.53	1.53	1.38	17	48.7	69.2	80.4	
	Calcium, Dissolved	mg/L			87.9	95.0	90.0	92.1	90.6	205	281	237	226	218	236	345	370	407	
	Sodium, Dissolved	mg/L			14.9	15.7	16.0	16.2	15.7	31.7	<50.0	47.1	43.7	42.4	31.0	50.2	44.6	48.9	
	Bicarbonate Alkalinity	mg/L as CaCO3			264	251	253	251	243	566	641	591	575	582	634	606	568	547	
	Chloride	mg/L	250 **	250 **	14.8	15.8	16.8	17.2	17.4	71.4	139	104	111	109	53.0	130	212	290	
	Magnesium, Dissolved	mg/L			19.3	19.4	19.7	20.1	19.8	54.9	78.9	68.4	64.9	62.9	59.6	85.8	99.0	109	
	Potassium, Dissolved	mg/L			7.12	7.19	7.22	7.35	7.31	13.0	14.8	14.3	14.1	13.8	14.2	17.0	17.6	18.9	
	Sulfate	mg/L	250 **	250 **	41.2	37.8	37.9	39.2	40.4	151	330	213	226	237	171	339	305	373	
	Total Alkalinity	mg/L as CaCO3			264	251	253	251	243	566	641	591	575	582	634	606	568	547	
	Iron, Dissolved	mg/L	0.30 **	0.3 **	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.121	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	
	Manganese, Dissolved	mg/L	0.05 **	0.05 **	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	1.82	3.62	3.00	2.85	2.77	0.589	0.567	0.633	0.588	
	Ammonia-Nitrogen	mg/L as N			<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.049	0.049	<0.040	<0.040	0.105	0.042	0.057	<0.040	
	Total Organic Carbon	mg/L			<0.50	<0.50 U	5.88	6.61	15.58	5.24	15.14	25.28	35.73	37.78	4.19	9.25	23.16	46.65	
	Total Dissolved Solids	mg/L	500 **	500 **	416	384	378 H	414	373	925	1310	1100	1060	1030	1080	1540	1580	1950	
	Total Suspended Solids	mg/L			<1 UJ	<0.9	<2	<2	<1	<1 UJ	<1	<2	<1	<1	<1 UJ	<0.9	<2	<1	
METALS	Antimony, Total	mg/L		0.006 *	<0.00100	<0.000400	<0.00100	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	
	Arsenic, Total	mg/L	0.00005 ***	0.010 *	0.00383	0.00390	0.00396	0.00382	0.00373	0.00363	0.00427	0.00370	0.00342	0.00346	0.00223	0.00707	0.00425	0.00473	
	Barium, Total	mg/L	1.0 *	2.0 *	0.0525	0.0556	0.0504	0.0493	0.0503	0.101	0.110	0.0950	0.0830	0.0805	0.141	0.204	0.171	0.180	
	Beryllium, Total	mg/L		0.004 *	<0.00100	<0.000400	<0.00100	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	
	Cadmium, Total	mg/L	0.01 *	0.005 *	<0.000500	<0.000200	<0.000500	<0.000500	<0.000200	<0.000500	<0.000200	<0.000500	<0.000200	<0.000200	<0.000500	<0.000200	<0.000500	<0.000200	
	Chromium, Total	mg/L	0.05 *	0.1 *	<0.00500	0.00182	<0.00500	<0.00500	0.00216	<0.00500	0.00250	<0.00500	<0.00100	<0.00100	<0.0250	0.0109	<0.0100	0.00117	
	Cobalt, Total	mg/L			0.0114	0.00692	0.00747	0.00708	0.00562	0.00189	0.00521	0.00320	0.00286	0.00278	0.00572	0.00630	0.00278	0.00521	
	Copper, Total	mg/L	1.0 **	1.3 *AL	<0.00250	<0.00100	<0.00250	<0.00250	<0.00100	0.00388	0.00507	0.00529	0.00506	0.00527	0.00662	0.00381	0.00360	0.00446	
	Lead, Total	mg/L	0.05 *	0.015 *AL	<0.00100	<0.000400	<0.00100	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	
	Nickel, Total	mg/L			<0.00250	<0.00100	<0.00250	<0.00250	<0.00100	0.0106	0.0188	0.0140	0.0121	0.0119	0.00351	0.00438	0.00456	0.00541	
	Selenium, Total	mg/L	0.01 *	0.05 *	<0.00500	<0.00200	<0.00500	0.00500	<0.00200	<0.00500	<0.00200	<0.00500	<0.00200	<0.00200	<0.00500	<0.00200	<0.00500	<0.00200	
	Silver, Total	mg/L	0.05 *	0.1 **	<0.00100	<0.000400	<0.00100	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	
	Thallium, Total	mg/L			<0.00100	<0.000400	<0.00100	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	
	Vanadium, Total	mg/L		0.002 *	0.0104	0.00738	0.0102	0.0102	0.00978	<0.0100	0.00376	0.00534	0.00530	0.00519	<0.0100	0.00455	0.00590	0.00516	
	Zinc, Total	mg/L	5.0 **	5.0 **	<0.0300	<0.0120	<0.0300	<0.0300	<0.0120	<0.0300	0.0355	<0.0300	0.0220	0.0216	<0.0300	<0.0120	<0.0300	<0.0120	
	VOLATILE ORGANIC COMPOUNDS	1,1,1,2-Tetrachloroethane	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
		1,1,1-Trichloroethane	µg/L	200 *	200 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
		1,1,2,2-Tetrachloroethane	µg/L			<0.20	<0.20	<0.20 UJ	<0.20 UJ	<0.20	<0.20	<0.20	<0.20 UJ	<0.20	<0.20	<0.20	<0.20	<0.20 UJ	<0.20
		1,1,2-Trichloroethane	µg/L		5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
		1,1-Dichloroethane	µg/L	1 ***		3.63	3.54	2.70	2.51	2.98	2.27	2.03	1.80	1.80	1.72	1.69	0.89	0.86	0.83
Vinyl Acetate		µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
1,1-Dichloroethene		µg/L		7 *	<0.20	<0.20	<0.20	<0.20	<0.20	0.27	0.38	0.27	0.27	0.24	<0.20	<0.20	<0.20	<0.20	
2-Butanone		µg/L			<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	
1,2,3-Trichloropropane		µg/L			<0.50	<0.50	<0.50 UJ	<0.50 UJ	<0.50	<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50	<0.50 UJ	<0.50	
1,2-Dibromo-3-Chloropropane		µg/L		0.2 *	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
1,2-Dibromoethane		µg/L	0.001 ***	0.05 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
1,2-Dichlorobenzene		µg/L		600 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
1,2-Dichloroethane		µg/L	0.5 ***	5 *	<0.20	<0.20	<0.20	<0.20	<0.20	0.32	0.29	0.27	0.29	0.27	<0.20	<0.20	<0.20	<0.20	
1,2-Dichloropropane		µg/L	0.6 ***	5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.21	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
1,4-Dichlorobenzene		µg/L	4 ***	75 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
2-Hexanone		µg/L			<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	
4-Methyl-2-pentanone		µg/L			<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	
Acetone		µg/L			<5.00	<5.00	<5.00	<5.00	<5.00 UJ	<5.00	5.69	<5.00	<5.00 UJ	<5.00 UJ	<5.00	13.9	<5.00.		

Table A-1. Groundwater Quality Monitoring Results
2025

Analyte	Units	GWQS	MCL	MW-4	MW-4	MW-4	MW-21	MW-4	MW-5	MW-5	MW-5	MW-5	MW-21	MW-6	MW-6	MW-6	MW-6
				3/19/2025	6/25/2025	9/15/2025	(MW-4 Dup) 9/15/2025	12/9/2025	3/19/2025	6/25/2025	9/16/2025	12/8/2025	(MW-5 Dup) 12/8/2025	3/19/2025	6/25/2025	9/16/2025	12/8/2025
VOLATILE ORGANIC COMPOUNDS (Cont.)	Chloromethane	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50 UJ	<0.50 UJ	<0.50	<0.50	<0.50	<0.50 UJ
	cis-1,2-Dichloroethene	µg/L	70 *	4.82	4.63	3.60	3.49	4.33	16.6	14.5	12.9	13.1	12.6	20.4	8.20	10.0	7.66
	cis-1,3-Dichloropropene	µg/L		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Dibromochloromethane	µg/L	80 * THM	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Dibromomethane	µg/L		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Ethylbenzene	µg/L	700 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Iodomethane	µg/L		<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	Methylene Chloride	µg/L	5 *** 5 *	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	m,p-Xylene	µg/L		<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
	o-Xylene	µg/L		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Styrene	µg/L	100 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Tetrachloroethene	µg/L	0.8 *** 5 *	0.72	0.81	0.65	0.63	0.87	8.73	7.96	6.77	7.42	7.26	13.9	11.0	11.5	12.3
	Toluene	µg/L	1000 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	trans-1,2-Dichloroethene	µg/L	100 *	<0.20	<0.20	<0.20	<0.20	<0.20	0.25	0.27	0.23	<0.20	0.22	0.36	<0.20	<0.20	<0.20
	trans-1,3-Dichloropropene	µg/L		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	trans-1,4-Dichloro-2-butene	µg/L		<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	Trichloroethene	µg/L	3 *** 5 *	0.80	0.86	0.70	0.67	0.92	3.55	3.21	2.80	3.03	3.05	6.18	3.90	4.41	4.37
	Trichlorofluoromethane	µg/L		0.68	0.65	0.47	0.49	0.56	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Vinyl Chloride	µg/L	0.02 *** 2 *	<0.20	<0.20	<0.20	<0.20	<0.20	0.46	1.32	1.10	0.90 J	<0.20 UJ	<0.20	<0.20	<0.20	<0.20
	Acrylonitrile	µg/L	0.07 ***	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
NATURAL ATTENUATION PARAMETERS	Ethane	µg/L		<1.12	<1.12	<1.12 UJ	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12
	Ethene	µg/L		<1.14	<1.14	<1.14 UJ	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14
	Methane	µg/L		<0.65	<0.65	<1.31 UJ	<1.31	<1.31	72.4	193	81.4	80.0	82.8	165	47.2	24.4	12.7
	Acetylene	µg/L		<1.06	<1.06	<1.06 UJ	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06

Notes:

GWQS = Water Quality Standards for Ground Waters of the State of Washington (Chapter 173-200 WAC)

MCL = Maximum Contaminant Level, State Drinking Water Regulations (Chapter 246-290 WAC)

* = Primary

** = Secondary

*** = Carcinogen

*AL = Action level (Chapter 246-290 WAC)

*THM = Primary MCL for the sum of all trihalomethanes

*XYL = Primary MCL for the sum of all xylenes

Bold = Does not meet GWQS or MCL

-- = Not analyzed

H = Estimated value; analyzed beyond specified holding time

J = Estimated value

J- = Estimated value, biased low

R = Rejected value

U = Undetected value

Table A-1. Groundwater Quality Monitoring Results
2025

Analyte		Units	GWQS	MCL	MW-8 3/18/2025	MW-8 6/25/2025	MW-8 9/15/2025	MW-8 12/9/2025	MW-9 3/18/2025	MW-9 6/25/2025	MW-9 9/15/2025	MW-9 12/9/2025	MW-10 3/19/2025	MW-10 6/25/2025	MW-10 9/16/2025	MW-10 12/8/2025
FIELD DATA	pH	units	6.5-8.5		7.59	7.80	7.71	6.76	6.71	7.21	6.57	6.42	6.14	6.89	5.85 R	6.61
	Conductivity	µmhos/cm		700 **	923	934	714	653	985	1051	1047	1059	1830	1925	2015	247.2 R
	Temperature	C°			21.8	24.4	24.5	22.5	23.5	24.5	24.1	21.1	24.5	27.2	26.1	22.7
	Redox	mv			-156.1	-87.4	69.9	163.1	-162.6	-136.9	54.3	147.1	-190.1	-127.9	-50.4	119.0
	Dissolved Oxygen	mg/L			6.86	6.96	8.83	7.03	2.04	2.36	3.23	3.17	0.18	0.21	0.33	0.50
	Turbidity	NTU			0.98	0.97	NA	0.64	0.74	0.93	NA	0.07	0.99	1.31	NA	1.09
WATER QUALITY PARAMETERS	Nitrate-Nitrogen	mg/L	10 *	10 *	26	25.6	16	12.1	8.6	9.28	8.91	9.1	25	16.9	33.5	37.7
	Calcium, Dissolved	mg/L			114	125	86.8	77.1	142	149	149	141	302	322	359	349
	Sodium, Dissolved	mg/L			27.3	29.2	23.3	19.9	24.1	26.0	27.4	25.1	28.2	29.7	31.9	31.9
	Bicarbonate Alkalinity	mg/L as CaCO3			153	152	161	174	384	391	386	363	750	762	714	665
	Chloride	mg/L	250 **	250 **	89.8	96.4	50.9	30.2	45.5	52.0	53.6	54.5	57.0	60.9	98.6	109
	Magnesium, Dissolved	mg/L			23.7	25.7	18.6	16.1	31.4	33.3	34.3	32.7	67.2	70.0	85.6	78.1
	Potassium, Dissolved	mg/L			9.51	9.60	8.07	7.68	9.39	9.14	9.75	9.55	15.1	14.7	16.0	16.4
	Sulfate	mg/L	250 **	250 **	83.4	87.4	63.8	55.5	73.0	85.8	78.9	80.6	185	245	320	308
	Total Alkalinity	mg/L as CaCO3			153	152	161	174	384	391	386	363	750	762	714	665
	Iron, Dissolved	mg/L	0.30 **	0.3 **	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.157	0.232	0.420	0.319
	Manganese, Dissolved	mg/L	0.05 **	0.05 **	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.178	0.279	0.489	0.553
	Ammonia-Nitrogen	mg/L as N			<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.081	0.097	0.123	0.081
	Total Organic Carbon	mg/L			0.86	0.92	5.36	10.09	0.95	5.57 J	13.27	24.96	8.54	17.96 J	29.39	55.85
	Total Dissolved Solids	mg/L	500 **	500 **	651	636	419	372	597	631	605	605	1240	936	1460	1400
	Total Suspended Solids	mg/L			<1 UJ	3	<2	<2	<1 UJ	<0.9	<2	<1	<1 UJ	2	<2	<1
METALS	Antimony, Total	mg/L		0.006 *	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400
	Arsenic, Total	mg/L	0.00005 ***	0.010 *	0.00704	0.00685	0.00809	0.00722	0.00176	0.00172	0.00172	0.00171	0.00215	0.00306	0.00359	0.00343
	Barium, Total	mg/L	1.0 *	2.0 *	0.0696	0.0869	0.0551	0.0444	0.0731	0.0881	0.0787	0.0727	0.166	0.208	0.208	0.176
	Beryllium, Total	mg/L		0.004 *	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400
	Cadmium, Total	mg/L	0.01 *	0.005 *	<0.000500	<0.000200	<0.000500	<0.000200	<0.000500	<0.000200	<0.000500	<0.000200	<0.000500	<0.000200	<0.000500	<0.000200
	Chromium, Total	mg/L	0.05 *	0.1 *	<0.0100	0.00606	0.00309	<0.0100	<0.0100	<0.00250	<0.00500	0.00208	<0.0250	<0.00250	<0.00500	0.00196
	Cobalt, Total	mg/L			<0.00100	0.000798	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	0.00116	0.00147	0.00147
	Copper, Total	mg/L	1.0 **	1.3 *AL	<0.00250	<0.00100	<0.00250	<0.00100	<0.00250	<0.00100	<0.00250	<0.00100	0.00276	0.00426	0.00322	0.00461
	Lead, Total	mg/L	0.05 *	0.015 *AL	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400
	Nickel, Total	mg/L			<0.00250	0.00372	0.00370	0.00208	<0.00250	0.00145	<0.00250	0.00154	0.00405	0.00459	0.00489	0.00550
	Selenium, Total	mg/L	0.01 *	0.05 *	<0.00500	0.00395	<0.00500	<0.00200	<0.00500	0.00239	<0.00500	<0.00200	<0.00500	<0.00200	<0.00500	<0.00200
	Silver, Total	mg/L	0.05 *	0.1 **	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400
	Thallium, Total	mg/L		0.002 *	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400
	Vanadium, Total	mg/L			0.0137	0.00892	0.0148	0.0129	0.00672	0.00584	0.00604	0.00584	<0.0100	0.00489	0.00409	0.00425
	Zinc, Total	mg/L	5.0 **	5.0 **	<0.0300	<0.0120	<0.0300	<0.0120	<0.0300	<0.0120	<0.0300	<0.0120	<0.0300	0.0143	<0.0300	<0.0120
VOLATILE ORGANIC COMPOUNDS	1,1,1,2-Tetrachloroethane	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,1,1-Trichloroethane	µg/L	200 *	200 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,1,2,2-Tetrachloroethane	µg/L			<0.20	<0.20	<0.20 UJ	<0.20	<0.20	<0.20	<0.20 UJ	<0.20	<0.20	<0.20	<0.20 UJ	<0.20
	1,1,2-Trichloroethane	µg/L		5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,1-Dichloroethane	µg/L	1 ***		<0.20	<0.20	0.35	0.82	1.26	1.20	1.11	1.12	3.70	2.52	1.67	1.54
	Vinyl Acetate	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,1-Dichloroethene	µg/L		7 *	<0.20	<0.20	<0.20	<0.20	0.25	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2-Butanone	µg/L			<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	1,2,3-Trichloropropane	µg/L			<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50 UJ	<0.50
	1,2-Dibromo-3-Chloropropane	µg/L		0.2 *	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	1,2-Dibromoethane	µg/L	0.001 ***	0.05 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,2-Dichlorobenzene	µg/L		600 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,2-Dichloroethane	µg/L	0.5 ***	5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.37	0.37	0.22	0.25
	1,2-Dichloropropane	µg/L	0.6 ***	5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,4-Dichlorobenzene	µg/L	4 ***	75 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2-Hexanone	µg/L			<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	4-Methyl-2-pentanone	µg/L			<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Acetone	µg/L			<5.00	<5.00	<5.00	<5.00 UJ	<5.00	7.03	<5.00	<5.00 UJ	<5.00	6.44	8.88	<5.00 UJ
	Benzene	µg/L	1 ***	5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Bromochloromethane	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Bromodichloromethane	µg/L	0.3 ***	80 * THM	0.37	0.34	0.49	0.66	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Bromoform	µg/L	5 ***	80 * THM	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Bromomethane	µg/L			<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	Carbon Disulfide	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Carbon Tetrachloride	µg/L	0.3 ***	5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Chlorobenzene	µg/L		100 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Chloroethane	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Chloroform	µg/L	7 ***	80 * THM	5.74	5.48	7.36	9.37	1.65	1.34	1.08	1.12	0.37	<0.20	<0.20	<0.20

Table A-1. Groundwater Quality Monitoring Results
2025

Analyte		Units	GWQS	MCL	MW-8 3/18/2025	MW-8 6/25/2025	MW-8 9/15/2025	MW-8 12/9/2025	MW-9 3/18/2025	MW-9 6/25/2025	MW-9 9/15/2025	MW-9 12/9/2025	MW-10 3/19/2025	MW-10 6/25/2025	MW-10 9/16/2025	MW-10 12/8/2025
VOLATILE ORGANIC COMPOUNDS (Cont.)	Chloromethane	µg/L			<0.50	<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50 UJ
	cis-1,2-Dichloroethene	µg/L		70 *	<0.20	<0.20	0.25	0.75	7.75	6.88	6.97	7.48	12.7	10.8	7.39	6.68
	cis-1,3-Dichloropropene	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Dibromochloromethane	µg/L		80 * THM	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Dibromomethane	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Ethylbenzene	µg/L		700 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Iodomethane	µg/L			<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	Methylene Chloride	µg/L	5 ***	5 *	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	m,p-Xylene	µg/L			<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
	o-Xylene	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Styrene	µg/L		100 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Tetrachloroethene	µg/L	0.8 ***	5 *	<0.20	<0.20	<0.20	<0.20	9.52	10.6	9.07	10.1	4.94	5.48	3.44	3.66
	Toluene	µg/L		1000 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	trans-1,2-Dichloroethene	µg/L		100 *	<0.20	<0.20	<0.20	<0.20	0.27	0.24	0.22	0.25	<0.20	<0.20	<0.20	<0.20
	trans-1,3-Dichloropropene	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	trans-1,4-Dichloro-2-butene	µg/L			<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	Trichloroethene	µg/L	3 ***	5 *	<0.20	<0.20	<0.20	<0.20	3.47	3.37	3.35	3.62	2.39	2.63	1.74	1.85
	Trichlorofluoromethane	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Vinyl Chloride	µg/L	0.02 ***	2 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.30	0.21	<0.20
	Acrylonitrile	µg/L	0.07 ***		<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
NATURAL ATTENUATION PARAMETERS	Ethane	µg/L			<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12
	Ethene	µg/L			<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14
	Methane	µg/L			<0.65	<0.65	<1.31	<1.31	4.37	1.07 J	<1.31	3.66	1710	999	469	163
	Acetylene	µg/L			<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06

Notes:

GWQS = Water Quality Standards for Ground Waters of the State of Washington (Chapter 173-200 WAC)

MCL = Maximum Contaminant Level, State Drinking Water Regulations (Chapter 246-290 WAC)

* = Primary

** = Secondary

*** = Carcinogen

*AL = Action level (Chapter 246-290 WAC)

*THM = Primary MCL for the sum of all trihalomethanes

*XYL = Primary MCL for the sum of all xylenes

Bold = Does not meet GWQS or MCL

-- = Not analyzed

H = Estimated value; analyzed beyond specified holding time

J = Estimated value

J- = Estimated value, biased low

R = Rejected value

U = Undetected value

Table A-1. Groundwater Quality Monitoring Results
2025

Analyte		Units	GWQS	MCL	MW-11 3/18/2025	MW-11 6/25/2025	MW-11 9/16/2025	MW-11 12/9/2025	MW-12 3/19/2025	MW-12 6/26/2025	MW-12 9/16/2025	MW-12 12/9/2025	Trip Blank 3/18/2025	Trip Blank 6/25/2025	Trip Blank 9/15/2025	Trip Blank 12/8/2025
FIELD DATA	pH	units	6.5-8.5		7.58	7.81	6.99	6.45	7.35	7.69	7.36	7.09	--	--	--	--
	Conductivity	µmhos/cm		700 **	1859	1734	1888	1960	446.4	423.7	495	596	--	--	--	--
	Temperature	C°			19.6	24.1	23.5	21.6	22.3	24.3	25.2	20.0	--	--	--	--
	Redox	mv			-115.1	-102.7	55.7	185.8	-88.1	-58.5	45.9	168.1	--	--	--	--
	Dissolved Oxygen	mg/L			8.09	6.81	11.28	10.35	5.87	7.04	7.57	7.22	--	--	--	--
	Turbidity	NTU			NA	2.89	NA	6.05	37.9	7.03	NA	30.7	--	--	--	--
WATER QUALITY PARAMETERS	Nitrate-Nitrogen	mg/L	10 *	10 *	48	49.2	53.6	54	6.5	6.28	6.38	7.04	--	--	--	--
	Calcium, Dissolved	mg/L			298	258	277	273	54.9	49.9	58.5	74.3	--	--	--	--
	Sodium, Dissolved	mg/L			21.4	20.6	21.9	21.5	20.3	20.4	22.2	21.5	--	--	--	--
	Bicarbonate Alkalinity	mg/L as CaCO3			170	172	163	161	161	144	171	206	--	--	--	--
	Chloride	mg/L	250 **	250 **	172	167	196	204	11.5	11.3	14.1	17.8	--	--	--	--
	Magnesium, Dissolved	mg/L			61.7	53.6	60.4	59.3	10.6	9.93	11.7	13.4	--	--	--	--
	Potassium, Dissolved	mg/L			12.9	11.6	12.4	12.5	7.55	7.10	7.80	7.81	--	--	--	--
	Sulfate	mg/L	250 **	250 **	358	297	355	379	33.8	34.4	35.1	40.0	--	--	--	--
	Total Alkalinity	mg/L as CaCO3			170	172	163	161	161	144	171	206	--	--	--	--
	Iron, Dissolved	mg/L	0.30 **	0.3 **	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	--	--	--	--
	Manganese, Dissolved	mg/L	0.05 **	0.05 **	0.0063	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	--	--	--	--
	Ammonia-Nitrogen	mg/L as N			<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	--	--	--	--
	Total Organic Carbon	mg/L			6.46	4.37	8.50	13.92	<0.50	<0.50 U	4.24	11.79	--	--	--	--
	Total Dissolved Solids	mg/L	500 **	500 **	1480	928	1330	1310	301	267	328	334	--	--	--	--
	Total Suspended Solids	mg/L			116 J	2	<2	4	28 J	3	21	45	--	--	--	--
METALS	Antimony, Total	mg/L		0.006 *	0.00228	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	--	--	--	--
	Arsenic, Total	mg/L	0.00005 ***	0.010 *	0.00660	0.00455	0.00426	0.00400	0.00776	0.00858	0.00802	0.00587	--	--	--	--
	Barium, Total	mg/L	1.0 *	2.0 *	0.126	0.100	0.0897	0.0811	0.0502	0.0456	0.0505	0.0533	--	--	--	--
	Beryllium, Total	mg/L		0.004 *	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	--	--	--	--
	Cadmium, Total	mg/L	0.01 *	0.005 *	<0.000500	<0.000200	<0.000500	<0.000200	<0.000500	<0.000200	<0.000500	<0.000200	--	--	--	--
	Chromium, Total	mg/L	0.05 *	0.1 *	<0.0250	0.0114	0.00778	0.0131	0.0128	0.0105	0.00656	0.0114	--	--	--	--
	Cobalt, Total	mg/L			0.00828	0.000658	<0.00100	0.000440	0.00123	0.00276	0.00131	0.00670	--	--	--	--
	Copper, Total	mg/L	1.0 **	1.3 *AL	0.0113	0.00124	<0.00250	0.0103	0.00497	0.00173	<0.00250	0.00858	--	--	--	--
	Lead, Total	mg/L	0.05 *	0.015 *AL	0.00399	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	0.000432	--	--	--	--
	Nickel, Total	mg/L			0.0127	0.00715	0.00508	0.00813	0.00611	0.00623	0.00371	0.0122	--	--	--	--
	Selenium, Total	mg/L	0.01 *	0.05 *	0.00546	0.00411	<0.00500	0.00450	<0.00500	<0.00200	<0.00500	<0.00200	--	--	--	--
	Silver, Total	mg/L	0.05 *	0.1 **	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	--	--	--	--
	Thallium, Total	mg/L		0.002 *	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	<0.00100	<0.000400	--	--	--	--
	Vanadium, Total	mg/L			0.0217	0.00939	0.00906	0.00802	0.0155	0.0131	0.0151	0.0114	--	--	--	--
	Zinc, Total	mg/L	5.0 **	5.0 **	0.0579	<0.0120	<0.0300	<0.0120	<0.0300	<0.0120	<0.0300	<0.0120	--	--	--	--
VOLATILE ORGANIC COMPOUNDS	1,1,1,2-Tetrachloroethane	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,1,1-Trichloroethane	µg/L	200 *	200 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,1,2,2-Tetrachloroethane	µg/L			<0.20	<0.20	<0.20 UJ	<0.20	<0.20	<0.20	<0.20 UJ	<0.20	<0.20	<0.20	<0.20 UJ	<0.20
	1,1,2-Trichloroethane	µg/L		5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,1-Dichloroethane	µg/L	1 ***		<0.20	<0.20	<0.20	<0.20	0.61	0.32	0.74	1.65	<0.20	<0.20	<0.20	<0.20
	Vinyl Acetate	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,1-Dichloroethene	µg/L		7 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2-Butanone	µg/L			<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	1,2,3-Trichloropropane	µg/L			<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50 UJ	<0.50
	1,2-Dibromo-3-Chloropropane	µg/L		0.2 *	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	1,2-Dibromoethane	µg/L	0.001 ***	0.05 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,2-Dichlorobenzene	µg/L		600 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,2-Dichloroethane	µg/L	0.5 ***	5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,2-Dichloropropane	µg/L	0.6 ***	5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1,4-Dichlorobenzene	µg/L	4 ***	75 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2-Hexanone	µg/L			<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	4-Methyl-2-pentanone	µg/L			<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Acetone	µg/L			<5.00	<5.00	<5.00	<5.00 UJ	<5.00	<5.00	<5.00	<5.00 UJ	5.20	<5.00	<5.00	<5.00 UJ
	Benzene	µg/L	1 ***	5 *	0.26	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Bromochloromethane	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Bromodichloromethane	µg/L	0.3 ***	80 * THM	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Bromoform	µg/L	5 ***	80 * THM	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Bromomethane	µg/L			<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	Carbon Disulfide	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Carbon Tetrachloride	µg/L	0.3 ***	5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Chlorobenzene	µg/L		100 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Chloroethane	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Chloroform	µg/L	7 ***	80 * THM	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.46	<0.20	<0.20	<0.20	<0.20

Table A-1. Groundwater Quality Monitoring Results
2025

Analyte		Units	GWQS	MCL	MW-11 3/18/2025	MW-11 6/25/2025	MW-11 9/16/2025	MW-11 12/9/2025	MW-12 3/19/2025	MW-12 6/26/2025	MW-12 9/16/2025	MW-12 12/9/2025	Trip Blank 3/18/2025	Trip Blank 6/25/2025	Trip Blank 9/15/2025	Trip Blank 12/8/2025
VOLATILE ORGANIC COMPOUNDS (Cont.)	Chloromethane	µg/L			<0.50	<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50 UJ	<0.50	<0.50	<0.50	<0.50 UJ
	cis-1,2-Dichloroethene	µg/L	70 *		<0.20	<0.20	<0.20	<0.20	0.51	0.27	0.67	1.81	<0.20	<0.20	<0.20	<0.20
	cis-1,3-Dichloropropene	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Dibromochloromethane	µg/L	80 * THM		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Dibromomethane	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Ethylbenzene	µg/L	700 *		0.40	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Iodomethane	µg/L			<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	Methylene Chloride	µg/L	5 ***	5 *	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	m,p-Xylene	µg/L			1.94	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
	o-Xylene	µg/L			0.77	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Styrene	µg/L	100 *		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Tetrachloroethene	µg/L	0.8 ***	5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Toluene	µg/L		1000 *	2.80	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	trans-1,2-Dichloroethene	µg/L		100 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	trans-1,3-Dichloropropene	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	trans-1,4-Dichloro-2-butene	µg/L			<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	Trichloroethene	µg/L	3 ***	5 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Trichlorofluoromethane	µg/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Vinyl Chloride	µg/L	0.02 ***	2 *	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Acrylonitrile	µg/L	0.07 ***		<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
NATURAL ATTENUATION PARAMETERS	Ethane	µg/L			<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	<1.12	NA	--
	Ethene	µg/L			<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	<1.14	NA	--
	Methane	µg/L			<0.65	<0.65	<1.31	<1.31	<0.65	<0.65	<1.31	<1.31	<0.65	<0.65	NA	--
	Acetylene	µg/L			<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	NA	--

Notes:

GWQS = Water Quality Standards for Ground Waters of the State of Washington (Chapter 173-200 WAC)

MCL = Maximum Contaminant Level, State Drinking Water Regulations (Chapter 246-290 WAC)

* = Primary

** = Secondary

*** = Carcinogen

*AL = Action level (Chapter 246-290 WAC)

*THM = Primary MCL for the sum of all trihalomethanes

*XYL = Primary MCL for the sum of all xylenes

Bold = Does not meet GWQS or MCL

-- = Not analyzed

H = Estimated value; analyzed beyond specified holding time

J = Estimated value

J- = Estimated value, biased low

R = Rejected value

U = Undetected value

Table A-2. Leachate Pond Results, Horn Rapids Landfill, First Quarter 2025

Analyte		Units	Leachate Pond 3/18/2025	Trip Blank 3/18/2025
FIELD DATA	pH	units	8.81	--
	Conductivity	µmhos/cm	4706	--
	Temperature	C°	9.7	--
	Redox	mv	-106.5	--
	Dissolved Oxygen	mg/L	7.08	--
	Turbidity	NTU	13.9	--
WATER QUALITY PARAMETERS	Nitrate-Nitrogen	mg/L	1.1	--
	Calcium, Total	mg/L	35.8	--
	Sodium, Total	mg/L	648	--
	Bicarbonate Alkalinity	mg/L as CaCO3	1070	--
	Chloride	mg/L	964	--
	Magnesium, Total	mg/L	184	--
	Potassium, Total	mg/L	289	--
	Sulfate	mg/L	67.8	--
	Total Alkalinity	mg/L as CaCO3	1200	--
	Iron, Total	mg/L	0.576	--
	Manganese, Total	mg/L	0.103	--
	Ammonia-Nitrogen	mg/L as N	8.09	--
	Total Organic Carbon	mg/L	72.99	--
	Total Dissolved Solids	mg/L	2580	--
	Total Suspended Solids	mg/L	28	--
METALS	Antimony, Total	mg/L	0.00246	--
	Arsenic, Total	mg/L	0.0192	--
	Barium, Total	mg/L	0.0408	--
	Beryllium, Total	mg/L	<0.00100	--
	Cadmium, Total	mg/L	<0.00100	--
	Chromium, Total	mg/L	<0.0100	--
	Cobalt, Total	mg/L	0.00840	--
	Copper, Total	mg/L	0.00681	--
	Lead, Total	mg/L	<0.00100	--
	Nickel, Total	mg/L	0.0699	--
	Selenium, Total	mg/L	<0.00500	--
	Silver, Total	mg/L	<0.00100	--
	Thallium, Total	mg/L	<0.00100	--
	Vanadium, Total	mg/L	0.00910	--
	Zinc, Total	mg/L	<0.0300	--

Table A-2. Leachate Pond Results, Horn Rapids Landfill, First Quarter 2025

			Leachate Pond 3/18/2025	Trip Blank 3/18/2025
Analyte		Units		
VOLATILE ORGANIC COMPOUNDS	1,1,1,2-Tetrachloroethane	µg/L	<0.20	<0.20
	1,1,1-Trichloroethane	µg/L	<0.20	<0.20
	1,1,2,2-Tetrachloroethane	µg/L	<0.20	<0.20
	1,1,2-Trichloroethane	µg/L	<0.20	<0.20
	1,1-Dichloroethane	µg/L	<0.20	<0.20
	Vinyl Acetate	µg/L	<0.20	<0.20
	1,1-Dichloroethene	µg/L	<0.20	<0.20
	2-Butanone	µg/L	<5.00	<5.00
	1,2,3-Trichloropropane	µg/L	<0.50	<0.50
	1,2-Dibromo-3-Chloropropane	µg/L	<0.50	<0.50
	1,2-Dibromoethane	µg/L	<0.20	<0.20
	1,2-Dichlorobenzene	µg/L	<0.20	<0.20
	1,2-Dichloroethane	µg/L	<0.20	<0.20
	1,2-Dichloropropane	µg/L	<0.20	<0.20
	1,4-Dichlorobenzene	µg/L	<0.20	<0.20
	2-Hexanone	µg/L	<5.00	<5.00
	4-Methyl-2-pentanone	µg/L	<5.00	<5.00
	Acetone	µg/L	22.0 J	5.20
	Benzene	µg/L	<0.20	<0.20
	Bromochloromethane	µg/L	<0.20	<0.20
	Bromodichloromethane	µg/L	<0.20	<0.20
	Bromoform	µg/L	<0.20	<0.20
	Bromomethane	µg/L	<1.00	<1.00
	Carbon Disulfide	µg/L	<0.20	<0.20
	Carbon Tetrachloride	µg/L	<0.20	<0.20
	Chlorobenzene	µg/L	<0.20	<0.20
	Chloroethane	µg/L	<0.20	<0.20
	Chloroform	µg/L	<0.20	<0.20
	Chloromethane	µg/L	<0.50	<0.50
	cis-1,2-Dichloroethene	µg/L	<0.20	<0.20
	cis-1,3-Dichloropropene	µg/L	<0.20	<0.20
	Dibromochloromethane	µg/L	<0.20	<0.20
	Dibromomethane	µg/L	<0.20	<0.20
	Ethylbenzene	µg/L	<0.20	<0.20
	Iodomethane	µg/L	<1.00	<1.00
	Methylene Chloride	µg/L	<1.00	<1.00
	m,p-Xylene	µg/L	<0.40	<0.40
	o-Xylene	µg/L	<0.20	<0.20
	Styrene	µg/L	<0.20	<0.20
	Tetrachloroethene	µg/L	<0.20	<0.20
	Toluene	µg/L	<0.20	<0.20
	trans-1,2-Dichloroethene	µg/L	<0.20	<0.20
	trans-1,3-Dichloropropene	µg/L	<0.20	<0.20
	trans-1,4-Dichloro-2-butene	µg/L	<1.00	<1.00
	Trichloroethene	µg/L	<0.20	<0.20
	Trichlorofluoromethane	µg/L	<0.20	<0.20
	Vinyl Chloride	µg/L	<0.20	<0.20
	Acrylonitrile	µg/L	<1.00	<1.00
NATURAL ATTENUATION PARAMETERS	Ethane	µg/L	<1.12	<1.12
	Ethene	µg/L	<1.14	<1.14
	Methane	µg/L	167	<0.65
	Acetylene	µg/L	<1.06	<1.06

Notes:

J = Estimated value
-- = Not analyzed

Appendix B

Fourth Quarter 2025
Laboratory Data Reports
and Data Review
Memorandum



Analytical Resources, LLC
Analytical Chemists and Consultants
Tukwila, WA

07 January 2026

Lisa Gilbert
Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle, WA 98104

RE: City of Richland Horn Rapids Landfill (555-3820-004)

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

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

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

Associated Work Order(s)

25L0244

Associated SDG ID(s)

N/A

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

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

Phillip Bates, Project Manager



Chain of Custody Record & Laboratory Analysis Request

AR Assigned Number: 25L0244		Turn-around Requested: 2 weeks		Date: 12/10/25		 Analytical Resources, LLC Analytical Chemists and Consultants 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6202 (fax)							
AR Client Company: Parametrix		Phone: 206.394.3667		Page: 1 of 2									
Client Contact: Lisa Gilbert				No. of Coolers: 3 Cooler Temps: 0.2° 1.3° 0.4°									
Client Project Name: City of Richland Horn Rapids Landfill				Analysis Requested								Notes/Comments	
Client Project #: 555-3820-004		Samplers: Nguyen		VOCs (173-351 App1)	Alk/Bicarb	TDS/TSS	TOC, NH3	Chloride, SO4	Dissolved Metals	Total Metals	RSK 175		
Sample ID	Date	Time	Matrix	No. Containers									
MW-1	12/8	1540	GW	12	✓	✓	✓	✓	✓	✓	✓	D Metals=Fe,Mn,Ca,Na,K,Mg	
MW-2	12/9	1500	GW	12	✓	✓	✓	✓	✓	✓	✓		
MW-3		1400	GW	12	✓	✓	✓	✓	✓	✓	✓		
MW-4		1320	GW	12	✓	✓	✓	✓	✓	✓	✓		
MW-5	12/8	1328	GW	12	✓	✓	✓	✓	✓	✓	✓		
MW-6	12/8	1435	GW	12	✓	✓	✓	✓	✓	✓	✓		
MW-8	12/9	1230	GW	16	✓	✓	✓	✓	✓	✓	✓	MS/MSD VOCs	
MW-9	12/9	1125	GW	12	✓	✓	✓	✓	✓	✓	✓		
MW-10	12/8	1200	GW	12	✓	✓	✓	✓	✓	✓	✓		
MW-11	12/9	1550	GW	12	✓	✓	✓	✓	✓	✓	✓		
Comments/Special Instructions TMetals=Sb,As,Ba,Be,Cd,Cr,Co,Cu,Pb,Ni,Se,Ag,Th,V,Zn				Relinquished by: (Signature) <i>[Signature]</i>		Received by: (Signature) <i>[Signature]</i>		Relinquished by: (Signature)		Received by: (Signature)			
				Printed Name: <i>Sally Nguyen</i>		Printed Name: <i>Matthew...</i>		Printed Name:		Printed Name:			
				Company: <i>PMX</i>		Company: <i>AR</i>		Company:		Company:			
				Date & Time: <i>12/10/25 @ 1340</i>		Date & Time: <i>12/10/25 1346</i>		Date & Time:		Date & Time:			

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

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

Chain of Custody Record & Laboratory Analysis Request

AR Assigned Number: 25L0244		Turn-around Requested: 2 weeks		Date: 12/10/25				Analytical Resources, LLC Analytical Chemists and Consultants 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6202 (fax)						
AR Client Company: Parametrix		Phone: 206.394.3667		Page: 2 of 2										
Client Contact: Lisa Gilbert				No. of Coolers: 3 Cooler Temps: 0.2° 1.3° 0.4°										
Client Project Name: City of Richland Horn Rapids Landfill					Analysis Requested								Notes/Comments	
Client Project #: 555-3820-004		Samplers: Nguyen			VOCs (173-351 App1)	Alk/Bicarb	TDS/TSS	TOC, NH3	Chloride, SO4	Dissolved Metals	Total Metals	RSK 175		
Sample ID	Date	Time	Matrix	No. Containers										
MW-12	12/9	1030	GW	12	✓	✓	✓	✓	✓	✓	✓	✓	D Metals=Fe,Mn,Ca,Na,K,Mg	
MW-21	12/8	1100	GW	12	✓	✓	✓	✓	✓	✓	✓	✓		
Trip blanks	—	—	W	4	✓									
Comments/Special Instructions TMetals=Sb,As,Ba,Be,Cd,Cr,Co,Cu,Pb,Ni,Se,Ag,Th,V,Zn				Relinquished by: (Signature) 		Received by: (Signature) 		Relinquished by: (Signature)		Received by: (Signature)				
				Printed Name: Sally Nguyen		Printed Name: Melissa Brown		Printed Name:		Printed Name:				
				Company: PMX		Company: AR		Company:		Company:				
				Date & Time: 12/10/25 @ 1340		Date & Time: 12/10/25 1340		Date & Time:		Date & Time:				

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

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



Analytical Resources, LLC
Analytical Chemists and Consultants

SUBCONTRACT ORDER
To: AmTest Laboratories
ARI Work Order:25L0244

SENDING LABORATORY:

Analytical Resources, LLC
4611 S. 134th Place, Suite 100
Tukwila, WA 98168
Phone: (206) 695-6200
Fax: (206) 695-6202
Project Manager: Phillip Bates
E-Mail: phillip.bates@arilabs.com

RECEIVING LABORATORY:

AmTest Laboratories
13600 NE 126th Pl Suite C
Kirkland, WA 98034
Phone :425-885-1664
Fax: -

PLEASE SEND DATA AND INVOICE TO subdata@arilabs.com

Analysis	Due	Expires	Sub Laboratory ID	Comments
Sample ID: 25L0244-01				
Sampled: 12/08/25 15:40 Matrix: Water				
Sulfate, IC, EPA 300.0	12/24/25	01/05/26 15:40		
Chloride, IC, EPA 300.0	12/24/25	01/05/26 15:40		
<i>Containers Supplied:</i>				
25L0244-01 I HDPE NM, 250mL				
Sample ID: 25L0244-03				
Sampled: 12/09/25 15:00 Matrix: Water				
Chloride, IC, EPA 300.0	12/24/25	01/06/26 15:00		
Sulfate, IC, EPA 300.0	12/24/25	01/06/26 15:00		
<i>Containers Supplied:</i>				
25L0244-03 I HDPE NM, 250mL				
Sample ID: 25L0244-05				
Sampled: 12/09/25 14:00 Matrix: Water				
Chloride, IC, EPA 300.0	12/24/25	01/06/26 14:00		
Sulfate, IC, EPA 300.0	12/24/25	01/06/26 14:00		
<i>Containers Supplied:</i>				
25L0244-05 I HDPE NM, 250mL				
Sample ID: 25L0244-07				
Sampled: 12/09/25 13:20 Matrix: Water				
Sulfate, IC, EPA 300.0	12/24/25	01/06/26 13:20		
Chloride, IC, EPA 300.0	12/24/25	01/06/26 13:20		
<i>Containers Supplied:</i>				
25L0244-07 I HDPE NM, 250mL				

Released By  AR LLC Date 12/11/25 0935 Received By  Date 12/11/25 11:13

Released By _____ Date _____ Received By _____ Date _____



SUBCONTRACT ORDER
To: AmTest Laboratories
ARI Work Order:25L0244

Analysis	Due	Expires	Sub Laboratory ID	Comments
Sample ID: 25L0244-09				
Sampled: 12/08/25 13:28 Matrix: Water				
Chloride, IC, EPA 300.0	12/24/25	01/05/26 13:28		
Sulfate, IC, EPA 300.0	12/24/25	01/05/26 13:28		
<i>Containers Supplied:</i>				
25L0244-09 I HDPE NM, 250mL				
Sample ID: 25L0244-11				
Sampled: 12/08/25 14:35 Matrix: Water				
Sulfate, IC, EPA 300.0	12/24/25	01/05/26 14:35		
Chloride, IC, EPA 300.0	12/24/25	01/05/26 14:35		
<i>Containers Supplied:</i>				
25L0244-11 I HDPE NM, 250mL				
Sample ID: 25L0244-13				
Sampled: 12/09/25 12:30 Matrix: Water				
Sulfate, IC, EPA 300.0	12/24/25	01/06/26 12:30		MS/MSD
Chloride, IC, EPA 300.0	12/24/25	01/06/26 12:30		
<i>Containers Supplied:</i>				
25L0244-13 I HDPE NM, 250mL				
Sample ID: 25L0244-15				
Sampled: 12/09/25 11:25 Matrix: Water				
Sulfate, IC, EPA 300.0	12/24/25	01/06/26 11:25		
Chloride, IC, EPA 300.0	12/24/25	01/06/26 11:25		
<i>Containers Supplied:</i>				
25L0244-15 I HDPE NM, 250mL				
Sample ID: 25L0244-17				
Sampled: 12/08/25 12:00 Matrix: Water				
Chloride, IC, EPA 300.0	12/24/25	01/05/26 12:00		
Sulfate, IC, EPA 300.0	12/24/25	01/05/26 12:00		
<i>Containers Supplied:</i>				
25L0244-17 I HDPE NM, 250mL				

ARLLC
Released By

12/11/25 0935
Date

Received By

Date

Released By

Date

Received By

Date



SUBCONTRACT ORDER
To: AmTest Laboratories
ARI Work Order:25L0244

Analysis	Due	Expires	Sub Laboratory ID	Comments
Sample ID: 25L0244-19				
Sampled: 12/09/25 15:50 Matrix: Water				
Chloride, IC, EPA 300.0	12/24/25	01/06/26 15:50		
Sulfate, IC, EPA 300.0	12/24/25	01/06/26 15:50		
<i>Containers Supplied:</i>				
25L0244-19 I HDPE NM, 250mL				
Sample ID: 25L0244-21				
Sampled: 12/09/25 10:30 Matrix: Water				
Chloride, IC, EPA 300.0	12/24/25	01/06/26 10:30		
Sulfate, IC, EPA 300.0	12/24/25	01/06/26 10:30		
<i>Containers Supplied:</i>				
25L0244-21 I HDPE NM, 250mL				
Sample ID: 25L0244-23				
Sampled: 12/08/25 11:00 Matrix: Water				
Sulfate, IC, EPA 300.0	12/24/25	01/05/26 11:00		
Chloride, IC, EPA 300.0	12/24/25	01/05/26 11:00		
<i>Containers Supplied:</i>				
25L0244-23 I HDPE NM, 250mL				

Released By ARLLC Date 12/11/25 0935 Received By [Signature] Date 12/11/25 1113



Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	25L0244-01	Water	08-Dec-2025 15:40	10-Dec-2025 13:40
MW-1	25L0244-02	Water	08-Dec-2025 15:40	10-Dec-2025 13:40
MW-2	25L0244-03	Water	09-Dec-2025 15:00	10-Dec-2025 13:40
MW-2	25L0244-04	Water	09-Dec-2025 15:00	10-Dec-2025 13:40
MW-3	25L0244-05	Water	09-Dec-2025 14:00	10-Dec-2025 13:40
MW-3	25L0244-06	Water	09-Dec-2025 14:00	10-Dec-2025 13:40
MW-4	25L0244-07	Water	09-Dec-2025 13:20	10-Dec-2025 13:40
MW-4	25L0244-08	Water	09-Dec-2025 13:20	10-Dec-2025 13:40
MW-5	25L0244-09	Water	08-Dec-2025 13:28	10-Dec-2025 13:40
MW-5	25L0244-10	Water	08-Dec-2025 13:28	10-Dec-2025 13:40
MW-6	25L0244-11	Water	08-Dec-2025 14:35	10-Dec-2025 13:40
MW-6	25L0244-12	Water	08-Dec-2025 14:35	10-Dec-2025 13:40
MW-8	25L0244-13	Water	09-Dec-2025 12:30	10-Dec-2025 13:40
MW-8	25L0244-14	Water	09-Dec-2025 12:30	10-Dec-2025 13:40
MW-9	25L0244-15	Water	09-Dec-2025 11:25	10-Dec-2025 13:40
MW-9	25L0244-16	Water	09-Dec-2025 11:25	10-Dec-2025 13:40
MW-10	25L0244-17	Water	08-Dec-2025 12:00	10-Dec-2025 13:40
MW-10	25L0244-18	Water	08-Dec-2025 12:00	10-Dec-2025 13:40
MW-11	25L0244-19	Water	09-Dec-2025 15:50	10-Dec-2025 13:40
MW-11	25L0244-20	Water	09-Dec-2025 15:50	10-Dec-2025 13:40
MW-12	25L0244-21	Water	09-Dec-2025 10:30	10-Dec-2025 13:40
MW-12	25L0244-22	Water	09-Dec-2025 10:30	10-Dec-2025 13:40
MW-21	25L0244-23	Water	08-Dec-2025 11:00	10-Dec-2025 13:40
MW-21	25L0244-24	Water	08-Dec-2025 11:00	10-Dec-2025 13:40
Trip Blanks	25L0244-25	Water	08-Dec-2025 11:00	10-Dec-2025 13:40



Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Work Order Case Narrative

Client: Parametrix, Inc.
Project: City of Richland Horn Rapids Landfill
Work Order: 25L0244

Sample receipt

Samples as listed on the preceding page were received 10-Dec-2025 13:40 under ARI work order 25L0244. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Ion Chromatography

The sample(s) were submitted to AmTest Laboratories for analysis. The AmTest report is included here in its entirety.

Volatiles - EPA Method SW8260D

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

Initial and continuing calibrations were within method requirements with allowed exceedances. The "Q"-flagged analytes were recovered low in SNL0195-ICV1.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

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

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

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

Volatile Gases - MEE by RSK175

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

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

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

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

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

Dissolved Metals - EPA Method 6010D



Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

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

Initial and continuing calibrations were within method requirements.

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

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

Total Metals - EPA Method 200.8

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

Initial and continuing calibrations including interference checks were within method requirements for reported elements.

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

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

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

Wet Chemistry

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

Initial and continuing calibrations were within method requirements.

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

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

The reference material (SRM) percent recoveries were within control limits.

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



WORK ORDER

25L0244

Client: Parametrix, Inc.

Project Manager: Phillip Bates

Project: City of Richland Horn Rapids Landfill

Project Number: 555-3820-004

Preservation Confirmation

Container ID	Container Type	pH	pH Paper Lot#: <u>N000119</u>
25L0244-01 A	VOA Vial, Clear, 40 mL, HCL		
25L0244-01 B	VOA Vial, Clear, 40 mL, HCL		
25L0244-01 C	VOA Vial, Clear, 40 mL, HCL		
25L0244-01 D	VOA Vial, Clear, 40 mL, HCL		
25L0244-01 E	VOA Vial, Clear, 40 mL, HCL		
25L0244-01 F	HDPE NM, 1000 mL		
25L0244-01 G	HDPE NM, 1000 mL		
25L0244-01 H	HDPE NM, 500 mL		
25L0244-01 I	HDPE NM, 250mL		
25L0244-01 J	Glass NM, Amber, 250 mL, 9N H2SO4	<u>4.2p</u>	
25L0244-01 K	HDPE NM, 250mL HNO3	<u>1</u>	
25L0244-02 A	HDPE NM, 250mL HNO3 (FF)		
25L0244-03 A	VOA Vial, Clear, 40 mL, HCL		
25L0244-03 B	VOA Vial, Clear, 40 mL, HCL		
25L0244-03 C	VOA Vial, Clear, 40 mL, HCL		
25L0244-03 D	VOA Vial, Clear, 40 mL, HCL		
25L0244-03 E	VOA Vial, Clear, 40 mL, HCL		
25L0244-03 F	HDPE NM, 1000 mL		
25L0244-03 G	HDPE NM, 1000 mL		
25L0244-03 H	HDPE NM, 500 mL		
25L0244-03 I	HDPE NM, 250mL		
25L0244-03 J	Glass NM, Amber, 250 mL, 9N H2SO4	<u>4.2p</u>	
25L0244-03 K	HDPE NM, 250mL HNO3	<u>1</u>	
25L0244-04 A	HDPE NM, 250mL HNO3 (FF)		
25L0244-05 A	VOA Vial, Clear, 40 mL, HCL		
25L0244-05 B	VOA Vial, Clear, 40 mL, HCL		
25L0244-05 C	VOA Vial, Clear, 40 mL, HCL		
25L0244-05 D	VOA Vial, Clear, 40 mL, HCL		
25L0244-05 E	VOA Vial, Clear, 40 mL, HCL		
25L0244-05 F	HDPE NM, 1000 mL		
25L0244-05 G	HDPE NM, 1000 mL		
25L0244-05 H	HDPE NM, 500 mL		



WORK ORDER

25L0244

Client: Parametrix, Inc.

Project Manager: Phillip Bates

Project: City of Richland Horn Rapids Landfill

Project Number: 555-3820-004

25L0244-05 I	HDPE NM, 250mL	
25L0244-05 J	Glass NM, Amber, 250 mL, 9N H2SO4	L2p I
25L0244-05 K	HDPE NM, 250mL HNO3	
25L0244-06 A	HDPE NM, 250mL HNO3 (FF)	
25L0244-07 A	VOA Vial, Clear, 40 mL, HCL	
25L0244-07 B	VOA Vial, Clear, 40 mL, HCL	
25L0244-07 C	VOA Vial, Clear, 40 mL, HCL	
25L0244-07 D	VOA Vial, Clear, 40 mL, HCL	
25L0244-07 E	VOA Vial, Clear, 40 mL, HCL	
25L0244-07 F	HDPE NM, 1000 mL	
25L0244-07 G	HDPE NM, 1000 mL	
25L0244-07 H	HDPE NM, 500 mL	
25L0244-07 I	HDPE NM, 250mL	
25L0244-07 J	Glass NM, Amber, 250 mL, 9N H2SO4	L2p I
25L0244-07 K	HDPE NM, 250mL HNO3	
25L0244-08 A	HDPE NM, 250mL HNO3 (FF)	
25L0244-09 A	VOA Vial, Clear, 40 mL, HCL	
25L0244-09 B	VOA Vial, Clear, 40 mL, HCL	
25L0244-09 C	VOA Vial, Clear, 40 mL, HCL	
25L0244-09 D	VOA Vial, Clear, 40 mL, HCL	
25L0244-09 E	VOA Vial, Clear, 40 mL, HCL	
25L0244-09 F	HDPE NM, 1000 mL	
25L0244-09 G	HDPE NM, 1000 mL	
25L0244-09 H	HDPE NM, 500 mL	
25L0244-09 I	HDPE NM, 250mL	
25L0244-09 J	Glass NM, Amber, 250 mL, 9N H2SO4	L2p I
25L0244-09 K	HDPE NM, 250mL HNO3	
25L0244-10 A	HDPE NM, 250mL HNO3 (FF)	
25L0244-11 A	VOA Vial, Clear, 40 mL, HCL	
25L0244-11 B	VOA Vial, Clear, 40 mL, HCL	
25L0244-11 C	VOA Vial, Clear, 40 mL, HCL	
25L0244-11 D	VOA Vial, Clear, 40 mL, HCL	
25L0244-11 E	VOA Vial, Clear, 40 mL, HCL	
25L0244-11 F	HDPE NM, 1000 mL	



WORK ORDER

25L0244

Client: Parametrix, Inc.

Project Manager: Phillip Bates

Project: City of Richland Horn Rapids Landfill

Project Number: 555-3820-004

25L0244-11 G	HDPE NM, 1000 mL	
25L0244-11 H	HDPE NM, 500 mL	
25L0244-11 I	HDPE NM, 250mL	
25L0244-11 J	Glass NM, Amber, 250 mL, 9N H2SO4	L2p
25L0244-11 K	HDPE NM, 250mL HNO3	I
25L0244-12 A	HDPE NM, 250mL HNO3 (FF)	
25L0244-13 A	VOA Vial, Clear, 40 mL, HCL	
25L0244-13 B	VOA Vial, Clear, 40 mL, HCL	
25L0244-13 C	VOA Vial, Clear, 40 mL, HCL	
25L0244-13 D	VOA Vial, Clear, 40 mL, HCL	
25L0244-13 E	VOA Vial, Clear, 40 mL, HCL	
25L0244-13 F	HDPE NM, 1000 mL	
25L0244-13 G	HDPE NM, 1000 mL	
25L0244-13 H	HDPE NM, 500 mL	
25L0244-13 I	HDPE NM, 250mL	
25L0244-13 J	Glass NM, Amber, 250 mL, 9N H2SO4	L2p
25L0244-13 K	HDPE NM, 250mL HNO3	I
25L0244-13 L	VOA Vial, Clear, 40 mL, HCL	
25L0244-13 M	VOA Vial, Clear, 40 mL, HCL	
25L0244-13 N	VOA Vial, Clear, 40 mL, HCL	
25L0244-13 O	VOA Vial, Clear, 40 mL, HCL	
25L0244-14 A	HDPE NM, 250mL HNO3 (FF)	L2p
25L0244-15 A	VOA Vial, Clear, 40 mL, HCL	
25L0244-15 B	VOA Vial, Clear, 40 mL, HCL	
25L0244-15 C	VOA Vial, Clear, 40 mL, HCL	
25L0244-15 D	VOA Vial, Clear, 40 mL, HCL	
25L0244-15 E	VOA Vial, Clear, 40 mL, HCL	
25L0244-15 F	HDPE NM, 1000 mL	
25L0244-15 G	HDPE NM, 1000 mL	
25L0244-15 H	HDPE NM, 500 mL	
25L0244-15 I	HDPE NM, 250mL	
25L0244-15 J	Glass NM, Amber, 250 mL, 9N H2SO4	L2p
25L0244-15 K	HDPE NM, 250mL HNO3	I
25L0244-16 A	HDPE NM, 250mL HNO3 (FF)	



WORK ORDER

25L0244

Client: Parametrix, Inc.

Project Manager: Phillip Bates

Project: City of Richland Horn Rapids Landfill

Project Number: 555-3820-004

25L0244-17 A	VOA Vial, Clear, 40 mL, HCL
25L0244-17 B	VOA Vial, Clear, 40 mL, HCL
25L0244-17 C	VOA Vial, Clear, 40 mL, HCL
25L0244-17 D	VOA Vial, Clear, 40 mL, HCL
25L0244-17 E	VOA Vial, Clear, 40 mL, HCL
25L0244-17 F	HDPE NM, 1000 mL
25L0244-17 G	HDPE NM, 1000 mL
25L0244-17 H	HDPE NM, 500 mL
25L0244-17 I	HDPE NM, 250mL
25L0244-17 J	Glass NM, Amber, 250 mL, 9N H2SO4
25L0244-17 K	HDPE NM, 250mL HNO3
25L0244-18 A	HDPE NM, 250mL HNO3 (FF)
25L0244-19 A	VOA Vial, Clear, 40 mL, HCL
25L0244-19 B	VOA Vial, Clear, 40 mL, HCL
25L0244-19 C	VOA Vial, Clear, 40 mL, HCL
25L0244-19 D	VOA Vial, Clear, 40 mL, HCL
25L0244-19 E	VOA Vial, Clear, 40 mL, HCL
25L0244-19 F	HDPE NM, 1000 mL
25L0244-19 G	HDPE NM, 1000 mL
25L0244-19 H	HDPE NM, 500 mL
25L0244-19 I	HDPE NM, 250mL
25L0244-19 J	Glass NM, Amber, 250 mL, 9N H2SO4
25L0244-19 K	HDPE NM, 250mL HNO3
25L0244-20 A	HDPE NM, 250mL HNO3 (FF)
25L0244-21 A	VOA Vial, Clear, 40 mL, HCL
25L0244-21 B	VOA Vial, Clear, 40 mL, HCL
25L0244-21 C	VOA Vial, Clear, 40 mL, HCL
25L0244-21 D	VOA Vial, Clear, 40 mL, HCL
25L0244-21 E	VOA Vial, Clear, 40 mL, HCL
25L0244-21 F	HDPE NM, 1000 mL
25L0244-21 G	HDPE NM, 1000 mL
25L0244-21 H	HDPE NM, 500 mL
25L0244-21 I	HDPE NM, 250mL
25L0244-21 J	Glass NM, Amber, 250 mL, 9N H2SO4

L2p
L

L2p
L

L2p



WORK ORDER

25L0244

Client: Parametrix, Inc.

Project Manager: Phillip Bates

Project: City of Richland Horn Rapids Landfill

Project Number: 555-3820-004

25L0244-21 K	HDPE NM, 250mL HNO ₃
25L0244-22 A	HDPE NM, 250mL HNO ₃ (FF)
25L0244-23 A	VOA Vial, Clear, 40 mL, HCL
25L0244-23 B	VOA Vial, Clear, 40 mL, HCL
25L0244-23 C	VOA Vial, Clear, 40 mL, HCL
25L0244-23 D	VOA Vial, Clear, 40 mL, HCL
25L0244-23 E	VOA Vial, Clear, 40 mL, HCL
25L0244-23 F	HDPE NM, 1000 mL
25L0244-23 G	HDPE NM, 1000 mL
25L0244-23 H	HDPE NM, 500 mL
25L0244-23 I	HDPE NM, 250mL
25L0244-23 J	Glass NM, Amber, 250 mL, 9N H ₂ SO ₄
25L0244-23 K	HDPE NM, 250mL HNO ₃
25L0244-24 A	HDPE NM, 250mL HNO ₃ (FF)
25L0244-25 A	VOA Vial, Clear, 40 mL, HCL
25L0244-25 B	VOA Vial, Clear, 40 mL, HCL
25L0244-25 C	VOA Vial, Clear, 40 mL, HCL
25L0244-25 D	VOA Vial, Clear, 40 mL, HCL

L2p
L

L2p
L

SA

Preservation Confirmed By

12/11/25

Date



Cooler Receipt Form

ARI Client: Parametrix

Project Name: Ham Register

COC No(s): _____ NA

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

Assigned ARI Job No: 2510244

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler? _____

YES NO

Were custody papers included with the cooler? _____

YES NO

Were custody papers properly filled out (ink, signed, etc.) _____

YES NO

Temperature of Cooler(s) (°C) Time 1240 0.2 L3 0.4

Temp Gun ID#: 509708

Was a temperature blank included in the cooler? _____

YES NO

Were coolers received between 0° - 6° (°C) _____

YES NO

Was an attempt made to cool the samples? _____

NA YES NO

Cooler Accepted by: MD Date: 12/10/25 Time: 1340

Complete custody forms and attach all shipping documents

Log-In Phase:

What kind of packing material was used? Bubble Wrap Wet Ice Gel Packs Baggies Foam Block N/A Other: _____

Are any samples that were out of temperature compliance documented in LIMS? _____

YES NO

How were bottles sealed in plastic bags? _____

Individually Grouped Not

Did all bottles arrive in good condition (unbroken)? _____

YES NO

Were all bottle labels complete and legible? _____

YES NO

Did the number of containers listed on COC match with the number of containers received? _____

YES NO ①

Did all bottle labels and tags agree with custody papers? _____

YES NO

Were all bottles used correct for the requested analyses? _____

YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ...

NA YES NO

Were all VOC vials free of air bubbles? _____

NA YES NO

Was sufficient amount of sample sent in each bottle? _____

YES NO

Date VOC Trip Blank was made at ARI _____

NA 12/02/25

Were the sample(s) split by ARI? _____

NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: SA Date: 12/11/25 Time: 0849 Labels checked by: SA

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

Additional Notes, Discrepancies, & Resolutions:

① 18 containers received for MS/MSD Sample line -13, 16 listed on COC.

By: SA Date: 12/11/25

Am Test Inc.
13600 NE 126th Place Suite C
Kirkland, WA
(425) 885-1664
www.amtestlab.com



***Professional
Analytical
Services***

December 30, 2025

Analytical Resources LLC
4611 S 134th Pl Suite 100
Tukwila, WA 98168
Attention: Phillip Bates

Project: ARI CHEM
Project Number: 25L0244
COC Number: 25L0244

Phillip Bates:

Enclosed please find the analytical data for your ARI CHEM project.

Your sample(s) were received on Thursday, December 11, 2025 and properly maintained prior to the subsequent analysis. The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA, Standard Methods or the Army Corps of Engineers.

Following the analytical results you will find the Quality Control (QA/QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Aaron Young". The signature is fluid and cursive, with the first name "Aaron" and last name "Young" clearly distinguishable.

ElementStationManager For Aaron Young

President

aarony@amtestlab.com

Am Test Inc.
13600 NE 126th Place Suite C
Kirkland, WA
(425) 885-1664
www.amtestlab.com



**Professional
Analytical
Services**

ANALYSIS REPORT

Date Received: 12/11/25
Date Reported: 12/30/25

Analytical Resources LLC
4611 S 134th Pl Suite 100
Tukwila, WA 98168
Attention: Phillip Bates
Project Name: ARI CHEM
Project #: 25L0244

Reported Samples

Lab ID	Sample	Matrix	Qualifiers	Date Sampled	Date Received
A25L0259-01	25L0244-01	Water		12/08/2025	12/11/2025
A25L0259-02	25L0244-03	Water		12/09/2025	12/11/2025
A25L0259-03	25L0244-05	Water		12/09/2025	12/11/2025
A25L0259-04	25L0244-07	Water		12/09/2025	12/11/2025
A25L0259-05	25L0244-09	Water		12/08/2025	12/11/2025
A25L0259-06	25L0244-11	Water		12/08/2025	12/11/2025
A25L0259-07	25L0244-13	Water		12/09/2025	12/11/2025
A25L0259-08	25L0244-15	Water		12/09/2025	12/11/2025
A25L0259-09	25L0244-17	Water		12/08/2025	12/11/2025
A25L0259-10	25L0244-19	Water		12/09/2025	12/11/2025
A25L0259-11	25L0244-21	Water		12/09/2025	12/11/2025
A25L0259-12	25L0244-23	Water		12/08/2025	12/11/2025

Am Test Inc.
13600 NE 126th Place Suite C
Kirkland, WA
(425) 885-1664
www.amtestlab.com



**Professional
Analytical
Services**

ANALYSIS REPORT

Date Received: 12/11/25

Date Reported: 12/30/25

Analytical Resources LLC

4611 S 134th Pl Suite 100
Tukwila, WA 98168
Attention: Phillip Bates
Project Name: ARI CHEM
Project #: 25L0244

AMTEST Identification Number: A25L0259-01

Client Identification: 25L0244-01

Sampling Date: 12/08/25 15:40

Anions by EPA Method 300.0

PARAMETER	RESULT	UNITS	Q	R.L.	METHOD	ANALYST	DATE
Chloride	20.8	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025
Sulfate	45.2	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025

AMTEST Identification Number: A25L0259-02

Client Identification: 25L0244-03

Sampling Date: 12/09/25 15:00

Anions by EPA Method 300.0

PARAMETER	RESULT	UNITS	Q	R.L.	METHOD	ANALYST	DATE
Chloride	28.1	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025
Sulfate	65.8	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025

AMTEST Identification Number: A25L0259-03

Client Identification: 25L0244-05

Sampling Date: 12/09/25 14:00

Anions by EPA Method 300.0

PARAMETER	RESULT	UNITS	Q	R.L.	METHOD	ANALYST	DATE
Chloride	13.2	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025
Sulfate	27.1	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025

AMTEST Identification Number: A25L0259-04

Client Identification: 25L0244-07

Sampling Date: 12/09/25 13:20

Anions by EPA Method 300.0

PARAMETER	RESULT	UNITS	Q	R.L.	METHOD	ANALYST	DATE
Chloride	17.4	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025
Sulfate	40.4	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025

Am Test Inc.
13600 NE 126th Place Suite C
Kirkland, WA
(425) 885-1664
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ANALYSIS REPORT

Date Received: 12/11/25

Date Reported: 12/30/25

Analytical Resources LLC

4611 S 134th Pl Suite 100
Tukwila, WA 98168
Attention: Phillip Bates
Project Name: ARI CHEM
Project #: 25L0244

AMTEST Identification Number: A25L0259-05

Client Identification: 25L0244-09

Sampling Date: 12/08/25 13:28

Anions by EPA Method 300.0

PARAMETER	RESULT	UNITS	Q	R.L.	METHOD	ANALYST	DATE
Chloride	111	mg/L	D	10.0	EPA 300.0_2.1_1993	AL	12/26/2025
Sulfate	226	mg/L	D	10.0	EPA 300.0_2.1_1993	AL	12/26/2025

AMTEST Identification Number: A25L0259-06

Client Identification: 25L0244-11

Sampling Date: 12/08/25 14:35

Anions by EPA Method 300.0

PARAMETER	RESULT	UNITS	Q	R.L.	METHOD	ANALYST	DATE
Chloride	290	mg/L	D	10.0	EPA 300.0_2.1_1993	AL	12/26/2025
Sulfate	373	mg/L	D	10.0	EPA 300.0_2.1_1993	AL	12/26/2025

AMTEST Identification Number: A25L0259-07

Client Identification: 25L0244-13

Sampling Date: 12/09/25 12:30

Anions by EPA Method 300.0

PARAMETER	RESULT	UNITS	Q	R.L.	METHOD	ANALYST	DATE
Chloride	30.2	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025
Sulfate	55.5	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025

AMTEST Identification Number: A25L0259-08

Client Identification: 25L0244-15

Sampling Date: 12/09/25 11:25

Anions by EPA Method 300.0

PARAMETER	RESULT	UNITS	Q	R.L.	METHOD	ANALYST	DATE
Chloride	54.5	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025
Sulfate	80.6	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025

Am Test Inc.
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Kirkland, WA
(425) 885-1664
www.amtestlab.com



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ANALYSIS REPORT

Date Received: 12/11/25
Date Reported: 12/30/25

Analytical Resources LLC
4611 S 134th Pl Suite 100
Tukwila, WA 98168
Attention: Phillip Bates
Project Name: ARI CHEM
Project #: 25L0244

AMTEST Identification Number: A25L0259-09
Client Identification: 25L0244-17
Sampling Date: 12/08/25 12:00

Anions by EPA Method 300.0

PARAMETER	RESULT	UNITS	Q	R.L.	METHOD	ANALYST	DATE
Chloride	109	mg/L	D	10.0	EPA 300.0_2.1_1993	AL	12/26/2025
Sulfate	308	mg/L	D	10.0	EPA 300.0_2.1_1993	AL	12/26/2025

AMTEST Identification Number: A25L0259-10
Client Identification: 25L0244-19
Sampling Date: 12/09/25 15:50

Anions by EPA Method 300.0

PARAMETER	RESULT	UNITS	Q	R.L.	METHOD	ANALYST	DATE
Chloride	204	mg/L	D	10.0	EPA 300.0_2.1_1993	AL	12/26/2025
Sulfate	379	mg/L	D	10.0	EPA 300.0_2.1_1993	AL	12/26/2025

AMTEST Identification Number: A25L0259-11
Client Identification: 25L0244-21
Sampling Date: 12/09/25 10:30

Anions by EPA Method 300.0

PARAMETER	RESULT	UNITS	Q	R.L.	METHOD	ANALYST	DATE
Chloride	17.8	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025
Sulfate	40.0	mg/L	D	1.00	EPA 300.0_2.1_1993	AL	12/23/2025

AMTEST Identification Number: A25L0259-12
Client Identification: 25L0244-23
Sampling Date: 12/08/25 11:00

Anions by EPA Method 300.0

PARAMETER	RESULT	UNITS	Q	R.L.	METHOD	ANALYST	DATE
Chloride	109	mg/L	D	10.0	EPA 300.0_2.1_1993	AL	12/26/2025
Sulfate	237	mg/L	D	10.0	EPA 300.0_2.1_1993	AL	12/26/2025



Analytical Resources LLC
4611 S 134th Pl Suite 100
Tukwila, WA 98168
Attention: Phillip Bates
Project Name: ARI CHEM
Project #: 25L0244

Date Received: 12/11/25
Date Reported: 12/30/25

ANALYSIS REPORT

Quality Control

Anions by EPA Method 300.0

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BCL0425 - No Prep - WetChem

LCS (BCL0425-BS1)					Prepared & Analyzed: 12/23/25					
Chloride	1.01		0.10	mg/L	1.000		101%	90-110%		
Sulfate	0.99		0.10	mg/L	1.000		99%	90-110%		

LCS (BCL0425-BS2)					Prepared & Analyzed: 12/23/25					
Chloride	1.03		0.10	mg/L	1.000		103%	90-110%		
Sulfate	1.00		0.10	mg/L	1.000		100%	90-110%		

Calibration Blank (BCL0425-CCB1)					Prepared & Analyzed: 12/23/25					
Chloride	ND	U		mg/L						
Sulfate	ND	U		mg/L						

Calibration Blank (BCL0425-CCB2)					Prepared & Analyzed: 12/23/25					
Chloride	ND	U		mg/L						
Sulfate	ND	U		mg/L						

Calibration Blank (BCL0425-CCB3)					Prepared & Analyzed: 12/23/25					
Chloride	ND	U		mg/L						
Sulfate	ND	U		mg/L						

Calibration Blank (BCL0425-CCB4)					Prepared & Analyzed: 12/24/25					
Chloride	ND	U		mg/L						
Sulfate	ND	U		mg/L						

Calibration Blank (BCL0425-CCB5)					Prepared & Analyzed: 12/24/25					
Chloride	ND	U		mg/L						
Sulfate	ND	U		mg/L						

Calibration Check (BCL0425-CCV1)					Prepared & Analyzed: 12/23/25					
Chloride	2.00		0.10	mg/L	2.000		100%	85-115%		
Sulfate	2.02		0.10	mg/L	2.000		101%	85-115%		

Calibration Check (BCL0425-CCV2)					Prepared & Analyzed: 12/23/25					
Chloride	2.01		0.10	mg/L	2.000		101%	85-115%		
Sulfate	2.03		0.10	mg/L	2.000		102%	85-115%		

Calibration Check (BCL0425-CCV3)					Prepared & Analyzed: 12/23/25					
----------------------------------	--	--	--	--	-------------------------------	--	--	--	--	--



Analytical Resources LLC
4611 S 134th Pl Suite 100
Tukwila, WA 98168
Attention: Phillip Bates
Project Name: ARI CHEM
Project #: 25L0244

ANALYSIS REPORT

Date Received: 12/11/25
Date Reported: 12/30/25

Quality Control
(Continued)

Anions by EPA Method 300.0 (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCL0425 - No Prep - WetChem (Continued)										
Calibration Check (BCL0425-CCV3)					Prepared & Analyzed: 12/23/25					
Chloride	2.02		0.10	mg/L	2.000		101%	85-115%		
Sulfate	2.04		0.10	mg/L	2.000		102%	85-115%		
Calibration Check (BCL0425-CCV4)					Prepared & Analyzed: 12/24/25					
Chloride	2.03		0.10	mg/L	2.000		102%	85-115%		
Sulfate	2.03		0.10	mg/L	2.000		102%	85-115%		
Calibration Check (BCL0425-CCV5)					Prepared & Analyzed: 12/24/25					
Chloride	2.02		0.10	mg/L	2.000		101%	85-115%		
Sulfate	2.05		0.10	mg/L	2.000		102%	85-115%		
Duplicate (BCL0425-DUP1)					Source: A25L0505-01 Prepared & Analyzed: 12/23/25					
Chloride	22.1		0.10	mg/L		22.1			0.008	20
Sulfate	7.23		0.10	mg/L		7.31			1	20
Duplicate (BCL0425-DUP2)					Source: A25L0259-09RX1 Prepared & Analyzed: 12/23/25					
Chloride	107	D	1.00	mg/L		109			2	20
Sulfate	284	D	1.00	mg/L		308			8	20
Duplicate (BCL0425-DUP3)					Source: A25L0260-07 Prepared & Analyzed: 12/23/25					
Chloride	7.85	D	1.00	mg/L		7.85			0.03	20
Sulfate	ND	U	1.00	mg/L		ND				20
Duplicate (BCL0425-DUP4)					Source: A25L0504-01 Prepared & Analyzed: 12/24/25					
Chloride	167		0.10	mg/L		167			0.1	20
Sulfate	28.7		0.10	mg/L		28.6			0.3	20
MRL Check (BCL0425-MRL1)					Prepared & Analyzed: 12/23/25					
Chloride	0.10		0.10	mg/L	0.1000		104%	50-150%		
Sulfate	0.09	J	0.10	mg/L	0.1000		88%	50-150%		
Matrix Spike (BCL0425-MS1)					Source: A25L0505-01 Prepared & Analyzed: 12/23/25					
Chloride	23.9	D	0.20	mg/L	2.000	22.1	89%	80-120%		
Sulfate	9.16	D	0.20	mg/L	2.000	7.31	92%	80-120%		
Matrix Spike (BCL0425-MS3)					Source: A25L0260-07 Prepared & Analyzed: 12/23/25					



ANALYSIS REPORT

Date Received: 12/11/25
Date Reported: 12/30/25

Analytical Resources LLC
4611 S 134th Pl Suite 100
Tukwila, WA 98168
Attention: Phillip Bates
Project Name: ARI CHEM
Project #: 25L0244

Quality Control
(Continued)

Anions by EPA Method 300.0 (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BCL0425 - No Prep - WetChem (Continued)

Matrix Spike (BCL0425-MS3)		Source: A25L0260-07			Prepared & Analyzed: 12/23/25					
Chloride	28.3	D	2.00	mg/L	20.00	7.85	102%	80-120%		
Sulfate	20.2	D	2.00	mg/L	20.00	ND	101%	80-120%		

Matrix Spike (BCL0425-MS4)		Source: A25L0504-01			Prepared & Analyzed: 12/24/25					
Sulfate	30.5	D	0.20	mg/L	2.000	28.6	97%	80-120%		

Reference (BCL0425-SRM1)		Prepared & Analyzed: 12/23/25								
Chloride	4.87		0.10	mg/L	5.000		97%	0-200%		
Sulfate	4.91		0.10	mg/L	5.000		98%	0-200%		

Batch: BCL0448 - No Prep - WetChem

LCS (BCL0448-BS1)		Prepared & Analyzed: 12/26/25								
Chloride	1.05		0.10	mg/L	1.000		105%	90-110%		
Sulfate	1.01		0.10	mg/L	1.000		101%	90-110%		

LCS (BCL0448-BS2)		Prepared & Analyzed: 12/26/25								
Chloride	1.05		0.10	mg/L	1.000		105%	90-110%		
Sulfate	1.02		0.10	mg/L	1.000		102%	90-110%		

Calibration Blank (BCL0448-CCB1)		Prepared & Analyzed: 12/26/25								
Chloride	ND	U		mg/L						
Sulfate	ND	U		mg/L						

Calibration Blank (BCL0448-CCB2)		Prepared & Analyzed: 12/26/25								
Chloride	ND	U		mg/L						
Sulfate	ND	U		mg/L						

Calibration Blank (BCL0448-CCB3)		Prepared & Analyzed: 12/26/25								
Chloride	ND	U		mg/L						
Sulfate	ND	U		mg/L						

Calibration Blank (BCL0448-CCB4)		Prepared & Analyzed: 12/27/25								
Chloride	ND	U		mg/L						
Sulfate	ND	U		mg/L						



Analytical Resources LLC
4611 S 134th Pl Suite 100
Tukwila, WA 98168
Attention: Phillip Bates
Project Name: ARI CHEM
Project #: 25L0244

ANALYSIS REPORT

Date Received: 12/11/25
Date Reported: 12/30/25

Quality Control
(Continued)

Anions by EPA Method 300.0 (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BCL0448 - No Prep - WetChem (Continued)										
Calibration Check (BCL0448-CCV1)					Prepared & Analyzed: 12/26/25					
Chloride	2.03		0.10	mg/L	2.000		101%	85-115%		
Sulfate	2.04		0.10	mg/L	2.000		102%	85-115%		
Calibration Check (BCL0448-CCV2)					Prepared & Analyzed: 12/26/25					
Chloride	2.04		0.10	mg/L	2.000		102%	85-115%		
Sulfate	2.04		0.10	mg/L	2.000		102%	85-115%		
Calibration Check (BCL0448-CCV3)					Prepared & Analyzed: 12/26/25					
Chloride	2.05		0.10	mg/L	2.000		102%	85-115%		
Sulfate	2.04		0.10	mg/L	2.000		102%	85-115%		
Calibration Check (BCL0448-CCV4)					Prepared & Analyzed: 12/27/25					
Chloride	2.05		0.10	mg/L	2.000		103%	85-115%		
Sulfate	2.05		0.10	mg/L	2.000		103%	85-115%		
Duplicate (BCL0448-DUP1)					Source: A25L0544-01 Prepared & Analyzed: 12/26/25					
Chloride	1.75		0.10	mg/L		1.75			0.2	20
MRL Check (BCL0448-MRL1)					Prepared & Analyzed: 12/26/25					
Chloride	0.11		0.10	mg/L	0.1000		112%	50-150%		
Sulfate	0.09	J	0.10	mg/L	0.1000		87%	50-150%		
Matrix Spike (BCL0448-MS1)					Source: A25L0544-01 Prepared & Analyzed: 12/26/25					
Chloride	3.82	D	0.20	mg/L	2.000	1.75	104%	80-120%		
Reference (BCL0448-SRM1)					Prepared & Analyzed: 12/26/25					
Chloride	4.99		0.10	mg/L	5.000		100%	0-200%		
Sulfate	4.96		0.10	mg/L	5.000		99%	0-200%		

Am Test Inc.
13600 NE 126th Place Suite C
Kirkland, WA
(425) 885-1664
www.amtestlab.com



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ANALYSIS REPORT

Date Received: 12/11/25
Date Reported: 12/30/25

Analytical Resources LLC
4611 S 134th Pl Suite 100
Tukwila, WA 98168
Attention: Phillip Bates
Project Name: ARI CHEM
Project #: 25L0244

Notes and Definitions

Item	Definition
D	The reported value is from a dilution.
Dry	Sample results reported on a dry weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.
RPD	Relative Percent Difference
%REC	Percent Recovery
Source	Sample that was matrix spiked or duplicated.



SUBCONTRACT ORDER
To: AmTest Laboratories
ARI Work Order:25L0244

A'25 L 0 2 5 9

SENDING LABORATORY:

Analytical Resources, LLC
4611 S. 134th Place, Suite 100
Tukwila, WA 98168
Phone: (206) 695-6200
Fax: (206) 695-6202
Project Manager: Phillip Bates
E-Mail: phillip.bates@arilabs.com

RECEIVING LABORATORY:

AmTest Laboratories
13600 NE 126th Pl Suite C
Kirkland, WA 98034
Phone :425-885-1664
Fax: -

PLEASE SEND DATA AND INVOICE TO subdata@arilabs.com

Analysis	Due	Expires	Sub Laboratory ID	Comments
Sample ID: 25L0244-01				
Sampled: 12/08/25 15:40 Matrix: Water			01	
Sulfate, IC, EPA 300.0	12/24/25	01/05/26 15:40		
Chloride, IC, EPA 300.0	12/24/25	01/05/26 15:40		
Containers Supplied:				
25L0244-01 I HDPE NM, 250mL				
Sample ID: 25L0244-03				
Sampled: 12/09/25 15:00 Matrix: Water			02	
Chloride, IC, EPA 300.0	12/24/25	01/06/26 15:00		
Sulfate, IC, EPA 300.0	12/24/25	01/06/26 15:00		
Containers Supplied:				
25L0244-03 I HDPE NM, 250mL				
Sample ID: 25L0244-05				
Sampled: 12/09/25 14:00 Matrix: Water			03	
Chloride, IC, EPA 300.0	12/24/25	01/06/26 14:00		
Sulfate, IC, EPA 300.0	12/24/25	01/06/26 14:00		
Containers Supplied:				
25L0244-05 I HDPE NM, 250mL				
Sample ID: 25L0244-07				
Sampled: 12/09/25 13:20 Matrix: Water			04	
Sulfate, IC, EPA 300.0	12/24/25	01/06/26 13:20		
Chloride, IC, EPA 300.0	12/24/25	01/06/26 13:20		
Containers Supplied:				
25L0244-07 I HDPE NM, 250mL				

ARLLC
Released By

12/11/25

0935
Date

Received By

Date

11:13

12/11/25

Released By

Date

Received By

Date

Printed: 12/11/2025 9:33:51AM

ARI Sample

Page 1 of 3



A'25 L 0 2 5 9

SUBCONTRACT ORDER
To: AmTest Laboratories
ARI Work Order:25L0244

Analysis	Due	Expires	Sub Laboratory ID	Comments
Sample ID: 25L0244-09				
Sampled: 12/08/25 13:28 Matrix: Water			05	
Chloride, IC, EPA 300.0	12/24/25	01/05/26 13:28		
Sulfate, IC, EPA 300.0	12/24/25	01/05/26 13:28		
Containers Supplied:				
25L0244-09 I HDPE NM, 250mL				
Sample ID: 25L0244-11				
Sampled: 12/08/25 14:35 Matrix: Water			06	
Sulfate, IC, EPA 300.0	12/24/25	01/05/26 14:35		
Chloride, IC, EPA 300.0	12/24/25	01/05/26 14:35		
Containers Supplied:				
25L0244-11 I HDPE NM, 250mL				
Sample ID: 25L0244-13				
Sampled: 12/09/25 12:30 Matrix: Water			07	MS/MSD
Sulfate, IC, EPA 300.0	12/24/25	01/06/26 12:30		
Chloride, IC, EPA 300.0	12/24/25	01/06/26 12:30		
Containers Supplied:				
25L0244-13 I HDPE NM, 250mL				
Sample ID: 25L0244-15				
Sampled: 12/09/25 11:25 Matrix: Water			08	
Sulfate, IC, EPA 300.0	12/24/25	01/06/26 11:25		
Chloride, IC, EPA 300.0	12/24/25	01/06/26 11:25		
Containers Supplied:				
25L0244-15 I HDPE NM, 250mL				
Sample ID: 25L0244-17				
Sampled: 12/08/25 12:00 Matrix: Water			09	
Chloride, IC, EPA 300.0	12/24/25	01/05/26 12:00		
Sulfate, IC, EPA 300.0	12/24/25	01/05/26 12:00		
Containers Supplied:				
25L0244-17 I HDPE NM, 250mL				

ARLLC
Released By

12/11/25 0935
Date

Received By

Date

11:13
12/11/25

Released By

Date

Received By

Date



A 25 L 0 2 5 9

SUBCONTRACT ORDER
To: AmTest Laboratories
ARI Work Order:25L0244

Analysis	Due	Expires	Sub Laboratory ID	Comments
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Sample ID: 25L0244-19

Sampled: 12/09/25 15:50 Matrix: Water

10

Chloride, IC, EPA 300.0

12/24/25

01/06/26 15:50

Sulfate, IC, EPA 300.0

12/24/25

01/06/26 15:50

Containers Supplied:

25L0244-19 I

HDPE NM, 250mL

Sample ID: 25L0244-21

Sampled: 12/09/25 10:30 Matrix: Water

11

Chloride, IC, EPA 300.0

12/24/25

01/06/26 10:30

Sulfate, IC, EPA 300.0

12/24/25

01/06/26 10:30

Containers Supplied:

25L0244-21 I

HDPE NM, 250mL

Sample ID: 25L0244-23

Sampled: 12/08/25 11:00 Matrix: Water

12

Sulfate, IC, EPA 300.0

12/24/25

01/05/26 11:00

Chloride, IC, EPA 300.0

12/24/25

01/05/26 11:00

Containers Supplied:

25L0244-23 I

HDPE NM, 250mL

Released By

Date

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Date

Released By

Date

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Date

Printed: 12/11/2025 9:33:51AM

ARI

Page 3 of 3



Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-1
25L0244-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/08/2025 15:40

Instrument: NT3 Analyst: FCL

Analyzed: 12/11/2025 17:31

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 25L0244-01 A

Preparation Batch: BNL0268

Sample Size: 10 mL

Prepared: 12/11/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	0.26	ug/L	
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	5.15	ug/L	
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U



Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-1
25L0244-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/08/2025 15:40

Instrument: NT3 Analyst: FCL

Analyzed: 12/11/2025 17:31

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			80-129 %	99.8	%	
Surrogate: Toluene-d8			80-120 %	97.9	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	97.1	%	
Surrogate: 1,2-Dichlorobenzene-d4			80-120 %	103	%	



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Reported:
07-Jan-2026 15:59

MW-1
25L0244-01 (Water)

Dissolved Gases

Method: EPA RSK-175

Sampled: 12/08/2025 15:40

Instrument: FID6 Analyst: PKC

Analyzed: 12/12/2025 12:01

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 25L0244-01 B

Preparation Batch: BNL0302

Sample Size: 10 mL

Prepared: 12/12/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acetylene	74-86-2	1	1.06	ND	ug/L	U
Methane	74-82-8	1	1.31	ND	ug/L	U
Ethane	74-84-0	1	1.12	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Surrogate: Propane			62-122 %	105	%	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-1
25L0244-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/08/2025 15:40

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/16/2025 19:38

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 25L0244-01 K 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	2	0.000400	ND	mg/L	U
Arsenic UCT	7440-38-2	2	0.000400	0.00383	mg/L	D
Barium	7440-39-3	2	0.00100	0.0390	mg/L	D
Beryllium	7440-41-7	2	0.000400	ND	mg/L	U
Cadmium UCT	7440-43-9	2	0.000200	ND	mg/L	U
Chromium	7440-47-3	2	0.00100	0.00274	mg/L	D
Cobalt UCT	7440-48-4	2	0.000400	0.00329	mg/L	D
Copper UCT	7440-50-8	2	0.00100	0.00956	mg/L	D
Lead	7439-92-1	2	0.000400	ND	mg/L	U
Nickel UCT	7440-02-0	2	0.00100	ND	mg/L	U
Selenium UCT	7782-49-2	2	0.00200	ND	mg/L	U
Silver	7440-22-4	2	0.000400	ND	mg/L	U
Thallium	7440-28-0	2	0.000400	ND	mg/L	U
Vanadium	7440-62-2	2	0.000400	0.00748	mg/L	D
Zinc UCT	7440-66-6	2	0.0120	ND	mg/L	U



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Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-1
25L0244-01 (Water)

Wet Chemistry

Method: EPA 350.1 M

Sampled: 12/08/2025 15:40

Instrument: LACHAT1 Analyst: LERB

Analyzed: 12/13/2025 14:21

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-01 J

Preparation Batch: BNL0276

Sample Size: 10 mL

Prepared: 12/11/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
# Ammonia-N	7664-41-7	1	0.040	0.040	ND	mg/L	U



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Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-1
25L0244-01 (Water)

Wet Chemistry

Method: SM 2320 B-11

Sampled: 12/08/2025 15:40

Instrument: Accumet AB150 Analyst: LERB

Analyzed: 12/16/2025 13:47

Sample Preparation: Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-01 H

Preparation Batch: BNL0315

Sample Size: 100 mL

Prepared: 12/13/2025

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	268	mg/L CaCO3	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	268	mg/L CaCO3	



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Reported:
07-Jan-2026 15:59

MW-1
25L0244-01 (Water)

Wet Chemistry

Method: SM 2540 C-11

Sampled: 12/08/2025 15:40

Instrument: BAL2 Analyst: RAL

Analyzed: 12/12/2025 11:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-01

Preparation Batch: BNL0303

Sample Size: 100 mL

Prepared: 12/12/2025

Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	401	mg/L	



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Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-1
25L0244-01 (Water)

Wet Chemistry

Method: SM 2540 D-11

Sampled: 12/08/2025 15:40

Instrument: BAL2 Analyst: RAL

Analyzed: 12/15/2025 10:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-01

Preparation Batch: BNL0330

Sample Size: 960 mL

Prepared: 12/15/2025

Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	ND	mg/L	U



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Project Number: 555-3820-004
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Reported:
07-Jan-2026 15:59

MW-1
25L0244-01 (Water)

Wet Chemistry

Method: SM 5310 B-11

Sampled: 12/08/2025 15:40

Instrument: TOC-LCSH Analyst: RMS

Analyzed: 01/02/2026 10:39

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-01 J

Preparation Batch: BNL0646

Sample Size: 20 mL

Prepared: 12/31/2025

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	18.29	mg/L	



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Reported:
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MW-1
25L0244-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010D

Sampled: 12/08/2025 15:40

Instrument: ICP3 Analyst: SH

Analyzed: 12/23/2025 22:31

Sample Preparation:

Preparation Method: WMN (No Prep)

Extract ID: 25L0244-02 A 01

Preparation Batch: BNL0385

Sample Size: 25 mL

Prepared: 12/17/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0500	91.6	mg/L	
Iron, Dissolved	7439-89-6	1	0.100	ND	mg/L	U
Magnesium, Dissolved	7439-95-4	1	0.0500	18.6	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0040	ND	mg/L	U
Potassium, Dissolved	7440-09-7	1	0.500	7.59	mg/L	
Sodium, Dissolved	7440-23-5	1	0.500	22.3	mg/L	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-2
25L0244-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT3 Analyst: FCL
Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BNL0268
Prepared: 12/11/2025
Sample Size: 10 mL
Final Volume: 10 mL
Extract ID: 25L0244-03 A
Sampled: 12/09/2025 15:00
Analyzed: 12/11/2025 17:53

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U



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Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-2
25L0244-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/09/2025 15:00

Instrument: NT3 Analyst: FCL

Analyzed: 12/11/2025 17:53

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			80-129 %	101	%	
Surrogate: Toluene-d8			80-120 %	95.1	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	99.7	%	
Surrogate: 1,2-Dichlorobenzene-d4			80-120 %	97.7	%	



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Reported:
07-Jan-2026 15:59

MW-2
25L0244-03 (Water)

Dissolved Gases

Method: EPA RSK-175

Sampled: 12/09/2025 15:00

Instrument: FID6 Analyst: PKC

Analyzed: 12/12/2025 12:14

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 25L0244-03 C

Preparation Batch: BNL0302

Sample Size: 10 mL

Prepared: 12/12/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acetylene	74-86-2	1	1.06	ND	ug/L	U
Methane	74-82-8	1	1.31	ND	ug/L	U
Ethane	74-84-0	1	1.12	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Surrogate: Propane			62-122 %	104	%	



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Reported:
07-Jan-2026 15:59

MW-2
25L0244-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 15:00

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/16/2025 20:22

Sample Preparation:

Preparation Method: REN - EPA 3010A M

Extract ID: 25L0244-03 K 01

Preparation Batch: BNL0295

Sample Size: 25 mL

Prepared: 12/12/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	2	0.000400	ND	mg/L	U
Arsenic UCT	7440-38-2	2	0.000400	0.00336	mg/L	D
Barium	7440-39-3	2	0.00100	0.0330	mg/L	D
Cadmium UCT	7440-43-9	2	0.000200	ND	mg/L	U
Cobalt UCT	7440-48-4	2	0.000400	0.000462	mg/L	D
Copper UCT	7440-50-8	2	0.00100	0.00107	mg/L	D
Lead	7439-92-1	2	0.000400	ND	mg/L	U
Nickel UCT	7440-02-0	2	0.00100	0.00610	mg/L	D
Selenium UCT	7782-49-2	2	0.00200	ND	mg/L	U
Silver	7440-22-4	2	0.000400	ND	mg/L	U
Thallium	7440-28-0	2	0.000400	ND	mg/L	U
Zinc UCT	7440-66-6	2	0.0120	ND	mg/L	U



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Reported:
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MW-2
25L0244-03 (Water)

Wet Chemistry

Method: EPA 350.1 M

Sampled: 12/09/2025 15:00

Instrument: LACHAT1 Analyst: LERB

Analyzed: 12/13/2025 14:22

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-03 J

Preparation Batch: BNL0276

Sample Size: 10 mL

Prepared: 12/11/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
# Ammonia-N	7664-41-7	1	0.040	0.040	ND	mg/L	U



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Reported:
07-Jan-2026 15:59

MW-2
25L0244-03 (Water)

Wet Chemistry

Method: SM 2320 B-11

Sampled: 12/09/2025 15:00

Instrument: Accumet AB150 Analyst: LERB

Analyzed: 12/16/2025 13:47

Sample Preparation: Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-03 H

Preparation Batch: BNL0315

Sample Size: 100 mL

Prepared: 12/13/2025

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
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Alkalinity, Bicarbonate		1	1.00	1.00	124	mg/L CaCO3	
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Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
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Alkalinity, Total		1	1.00	1.00	124	mg/L CaCO3	
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Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-2
25L0244-03 (Water)

Wet Chemistry

Method: SM 2540 C-11

Sampled: 12/09/2025 15:00

Instrument: BAL2 Analyst: RAL

Analyzed: 12/12/2025 11:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-03

Preparation Batch: BNL0303

Sample Size: 100 mL

Prepared: 12/12/2025

Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	346	mg/L	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-2
25L0244-03 (Water)

Wet Chemistry

Method: SM 2540 D-11

Sampled: 12/09/2025 15:00

Instrument: BAL2 Analyst: RAL

Analyzed: 12/15/2025 10:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-03

Preparation Batch: BNL0330

Sample Size: 950 mL

Prepared: 12/15/2025

Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	ND	mg/L	U



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-2
25L0244-03 (Water)

Wet Chemistry

Method: SM 5310 B-11

Sampled: 12/09/2025 15:00

Instrument: TOC-LCSH Analyst: RMS

Analyzed: 01/02/2026 10:56

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-03 J

Preparation Batch: BNL0646

Sample Size: 20 mL

Prepared: 12/31/2025

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	8.34	mg/L	



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Project Manager: Lisa Gilbert

Reported:
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MW-2
25L0244-03RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 15:00

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/19/2025 15:00

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 25L0244-03RE1 K 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Beryllium	7440-41-7	5	0.00100	ND	mg/L	U
Chromium	7440-47-3	5	0.00250	0.00891	mg/L	D



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Reported:
07-Jan-2026 15:59

MW-2
25L0244-03RE2 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 15:00

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/22/2025 22:23

Sample Preparation: Preparation Method: REN - EPA 3010A M

Extract ID: 25L0244-03RE2 K 01

Preparation Batch: BNL0295

Sample Size: 25 mL

Prepared: 12/12/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vanadium	7440-62-2	5	0.00100	0.00905	mg/L	D



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Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-2
25L0244-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010D
Instrument: ICP3 Analyst: SH
Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BNL0385
Prepared: 12/17/2025
Sample Size: 25 mL
Final Volume: 25 mL
Extract ID: 25L0244-04 A 01
Sampled: 12/09/2025 15:00
Analyzed: 12/23/2025 22:11

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0500	70.1	mg/L	
Iron, Dissolved	7439-89-6	1	0.100	ND	mg/L	U
Magnesium, Dissolved	7439-95-4	1	0.0500	15.0	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0040	ND	mg/L	U
Potassium, Dissolved	7440-09-7	1	0.500	6.30	mg/L	
Sodium, Dissolved	7440-23-5	1	0.500	14.0	mg/L	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
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MW-3
25L0244-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT3 Analyst: FCL
Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BNL0268 Sample Size: 10 mL
Prepared: 12/11/2025 Final Volume: 10 mL

Sampled: 12/09/2025 14:00

Analyzed: 12/11/2025 18:15

Extract ID: 25L0244-05 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	0.23	ug/L	
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	5.20	ug/L	
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U



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Reported:
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MW-3
25L0244-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/09/2025 14:00

Instrument: NT3 Analyst: FCL

Analyzed: 12/11/2025 18:15

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			80-129 %	102	%	
Surrogate: Toluene-d8			80-120 %	97.3	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	100	%	
Surrogate: 1,2-Dichlorobenzene-d4			80-120 %	100	%	



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Reported:
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MW-3
25L0244-05 (Water)

Dissolved Gases

Method: EPA RSK-175
Instrument: FID6 Analyst: PKC
Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BNL0302 Sample Size: 10 mL
Prepared: 12/12/2025 Final Volume: 10 mL

Sampled: 12/09/2025 14:00

Analyzed: 12/12/2025 12:27

Extract ID: 25L0244-05 D

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acetylene	74-86-2	1	1.06	ND	ug/L	U
Methane	74-82-8	1	1.31	ND	ug/L	U
Ethane	74-84-0	1	1.12	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Surrogate: Propane			62-122 %	112	%	



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Reported:
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MW-3
25L0244-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 14:00

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/16/2025 20:26

Sample Preparation:

Preparation Method: REN - EPA 3010A M

Extract ID: 25L0244-05 K 01

Preparation Batch: BNL0295

Sample Size: 25 mL

Prepared: 12/12/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	2	0.000400	ND	mg/L	U
Arsenic UCT	7440-38-2	2	0.000400	0.00812	mg/L	D
Barium	7440-39-3	2	0.00100	0.0268	mg/L	D
Cadmium UCT	7440-43-9	2	0.000200	ND	mg/L	U
Cobalt UCT	7440-48-4	2	0.000400	ND	mg/L	U
Copper UCT	7440-50-8	2	0.00100	ND	mg/L	U
Lead	7439-92-1	2	0.000400	ND	mg/L	U
Nickel UCT	7440-02-0	2	0.00100	ND	mg/L	U
Selenium UCT	7782-49-2	2	0.00200	ND	mg/L	U
Silver	7440-22-4	2	0.000400	ND	mg/L	U
Thallium	7440-28-0	2	0.000400	ND	mg/L	U
Zinc UCT	7440-66-6	2	0.0120	ND	mg/L	U



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Reported:
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MW-3
25L0244-05 (Water)

Wet Chemistry

Method: EPA 350.1 M

Sampled: 12/09/2025 14:00

Instrument: LACHAT1 Analyst: GJD

Analyzed: 12/17/2025 15:13

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-05 J

Preparation Batch: BNL0363

Sample Size: 10 mL

Prepared: 12/16/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
# Ammonia-N	7664-41-7	1	0.040	0.040	ND	mg/L	U



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Reported:
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MW-3
25L0244-05 (Water)

Wet Chemistry

Method: SM 2320 B-11

Sampled: 12/09/2025 14:00

Instrument: Accumet AB150 Analyst: LERB

Analyzed: 12/16/2025 13:47

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-05 H

Preparation Batch: BNL0315

Sample Size: 100 mL

Prepared: 12/13/2025

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	207	mg/L CaCO3	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	207	mg/L CaCO3	



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Reported:
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MW-3
25L0244-05 (Water)

Wet Chemistry

Method: SM 2540 C-11

Sampled: 12/09/2025 14:00

Instrument: BAL2 Analyst: RAL

Analyzed: 12/12/2025 11:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-05

Preparation Batch: BNL0303

Sample Size: 100 mL

Prepared: 12/12/2025

Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	286	mg/L	



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Reported:
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MW-3
25L0244-05 (Water)

Wet Chemistry

Method: SM 2540 D-11

Sampled: 12/09/2025 14:00

Instrument: BAL2 Analyst: RAL

Analyzed: 12/15/2025 10:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-05

Preparation Batch: BNL0330

Sample Size: 960 mL

Prepared: 12/15/2025

Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	ND	mg/L	U



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Reported:
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MW-3
25L0244-05 (Water)

Wet Chemistry

Method: SM 5310 B-11

Sampled: 12/09/2025 14:00

Instrument: TOC-LCSH Analyst: RMS

Analyzed: 01/02/2026 11:14

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-05 J

Preparation Batch: BNL0646

Sample Size: 20 mL

Prepared: 12/31/2025

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	13.05	mg/L	



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MW-3
25L0244-05RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 14:00

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/19/2025 15:05

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 25L0244-05RE1 K 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Beryllium	7440-41-7	5	0.00100	ND	mg/L	U
Chromium	7440-47-3	5	0.00250	ND	mg/L	U



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Reported:
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MW-3
25L0244-05RE2 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 14:00

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/22/2025 22:28

Sample Preparation: Preparation Method: REN - EPA 3010A M

Extract ID: 25L0244-05RE2 K 01

Preparation Batch: BNL0295

Sample Size: 25 mL

Prepared: 12/12/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vanadium	7440-62-2	5	0.00100	0.0139	mg/L	D



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Reported:
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MW-3
25L0244-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010D

Sampled: 12/09/2025 14:00

Instrument: ICP3 Analyst: SH

Analyzed: 12/23/2025 22:14

Sample Preparation:

Preparation Method: WMN (No Prep)

Extract ID: 25L0244-06 A 01

Preparation Batch: BNL0385

Sample Size: 25 mL

Prepared: 12/17/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0500	64.4	mg/L	
Iron, Dissolved	7439-89-6	1	0.100	ND	mg/L	U
Magnesium, Dissolved	7439-95-4	1	0.0500	13.0	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0040	ND	mg/L	U
Potassium, Dissolved	7440-09-7	1	0.500	7.00	mg/L	
Sodium, Dissolved	7440-23-5	1	0.500	15.2	mg/L	



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Reported:
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MW-4
25L0244-07 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT3 Analyst: FCL
Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BNL0268 Sample Size: 10 mL
Prepared: 12/11/2025 Final Volume: 10 mL

Sampled: 12/09/2025 13:20

Analyzed: 12/11/2025 18:37

Extract ID: 25L0244-07 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	0.56	ug/L	
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	2.98	ug/L	
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	4.33	ug/L	
Chloroform	67-66-3	1	0.20	0.39	ug/L	
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	0.92	ug/L	
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	0.87	ug/L	
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-4
25L0244-07 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/09/2025 13:20

Instrument: NT3 Analyst: FCL

Analyzed: 12/11/2025 18:37

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			80-129 %	104	%	
Surrogate: Toluene-d8			80-120 %	96.2	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	97.3	%	
Surrogate: 1,2-Dichlorobenzene-d4			80-120 %	96.8	%	



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719 2nd Avenue, Suite 200
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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-4
25L0244-07 (Water)

Dissolved Gases

Method: EPA RSK-175

Sampled: 12/09/2025 13:20

Instrument: FID6 Analyst: PKC

Analyzed: 12/12/2025 12:41

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 25L0244-07 D

Preparation Batch: BNL0302

Sample Size: 10 mL

Prepared: 12/12/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acetylene	74-86-2	1	1.06	ND	ug/L	U
Methane	74-82-8	1	1.31	ND	ug/L	U
Ethane	74-84-0	1	1.12	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Surrogate: Propane			62-122 %	102	%	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-4
25L0244-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 13:20

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/16/2025 21:42

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 25L0244-07 K 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	2	0.000400	ND	mg/L	U
Arsenic UCT	7440-38-2	2	0.000400	0.00373	mg/L	D
Barium	7440-39-3	2	0.00100	0.0503	mg/L	D
Cadmium UCT	7440-43-9	2	0.000200	ND	mg/L	U
Chromium	7440-47-3	2	0.00100	0.00216	mg/L	D
Cobalt UCT	7440-48-4	2	0.000400	0.00562	mg/L	D
Copper UCT	7440-50-8	2	0.00100	ND	mg/L	U
Lead	7439-92-1	2	0.000400	ND	mg/L	U
Nickel UCT	7440-02-0	2	0.00100	ND	mg/L	U
Selenium UCT	7782-49-2	2	0.00200	ND	mg/L	U
Silver	7440-22-4	2	0.000400	ND	mg/L	U
Thallium	7440-28-0	2	0.000400	ND	mg/L	U
Vanadium	7440-62-2	2	0.000400	0.00978	mg/L	D
Zinc UCT	7440-66-6	2	0.0120	ND	mg/L	U



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-4
25L0244-07 (Water)

Wet Chemistry

Method: EPA 350.1 M

Sampled: 12/09/2025 13:20

Instrument: LACHAT1 Analyst: GJD

Analyzed: 12/17/2025 15:14

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-07 J

Preparation Batch: BNL0363

Sample Size: 10 mL

Prepared: 12/16/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
# Ammonia-N	7664-41-7	1	0.040	0.040	ND	mg/L	U



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Project Manager: Lisa Gilbert

Reported:
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MW-4
25L0244-07 (Water)

Wet Chemistry

Method: SM 2320 B-11

Sampled: 12/09/2025 13:20

Instrument: Accumet AB150 Analyst: LERB

Analyzed: 12/16/2025 13:47

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-07 H

Preparation Batch: BNL0315

Sample Size: 100 mL

Prepared: 12/13/2025

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	243	mg/L CaCO3	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	243	mg/L CaCO3	



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Project Manager: Lisa Gilbert

Reported:
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MW-4
25L0244-07 (Water)

Wet Chemistry

Method: SM 2540 C-11

Sampled: 12/09/2025 13:20

Instrument: BAL2 Analyst: RAL

Analyzed: 12/12/2025 11:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-07

Preparation Batch: BNL0303

Sample Size: 100 mL

Prepared: 12/12/2025

Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	373	mg/L	



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Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-4
25L0244-07 (Water)

Wet Chemistry

Method: SM 2540 D-11

Sampled: 12/09/2025 13:20

Instrument: BAL2 Analyst: RAL

Analyzed: 12/15/2025 10:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-07

Preparation Batch: BNL0330

Sample Size: 960 mL

Prepared: 12/15/2025

Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	ND	mg/L	U



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Project Manager: Lisa Gilbert

Reported:
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MW-4
25L0244-07 (Water)

Wet Chemistry

Method: SM 5310 B-11

Sampled: 12/09/2025 13:20

Instrument: TOC-LCSH Analyst: RMS

Analyzed: 01/02/2026 11:40

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-07 J

Preparation Batch: BNL0646

Sample Size: 20 mL

Prepared: 12/31/2025

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	15.58	mg/L	



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Reported:
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MW-4
25L0244-07RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 13:20

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/17/2025 21:02

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Extract ID: 25L0244-07RE1 K 01

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Beryllium	7440-41-7	2	0.000400	ND	mg/L	U



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Project Manager: Lisa Gilbert

Reported:
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MW-4
25L0244-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010D

Sampled: 12/09/2025 13:20

Instrument: ICP3 Analyst: SH

Analyzed: 12/23/2025 22:17

Sample Preparation:

Preparation Method: WMN (No Prep)

Extract ID: 25L0244-08 A 01

Preparation Batch: BNL0385

Sample Size: 25 mL

Prepared: 12/17/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0500	90.6	mg/L	
Iron, Dissolved	7439-89-6	1	0.100	ND	mg/L	U
Magnesium, Dissolved	7439-95-4	1	0.0500	19.8	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0040	ND	mg/L	U
Potassium, Dissolved	7440-09-7	1	0.500	7.31	mg/L	
Sodium, Dissolved	7440-23-5	1	0.500	15.7	mg/L	



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Project Manager: Lisa Gilbert

Reported:
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MW-5
25L0244-09 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT3 Analyst: FCL
Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BNL0268 Sample Size: 10 mL
Prepared: 12/11/2025 Final Volume: 10 mL

Sampled: 12/08/2025 13:28

Analyzed: 12/11/2025 19:00

Extract ID: 25L0244-09 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	0.90	ug/L	
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	0.27	ug/L	
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	1.80	ug/L	
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	13.1	ug/L	
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	0.29	ug/L	
Benzene	71-43-2	1	0.20	0.21	ug/L	
Trichloroethene	79-01-6	1	0.20	3.03	ug/L	
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	7.42	ug/L	
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-5
25L0244-09 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/08/2025 13:28

Instrument: NT3 Analyst: FCL

Analyzed: 12/11/2025 19:00

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			80-129 %	103	%	
Surrogate: Toluene-d8			80-120 %	96.8	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	99.1	%	
Surrogate: 1,2-Dichlorobenzene-d4			80-120 %	98.8	%	



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Project Manager: Lisa Gilbert

Reported:
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MW-5
25L0244-09 (Water)

Dissolved Gases

Method: EPA RSK-175

Sampled: 12/08/2025 13:28

Instrument: FID6 Analyst: PKC

Analyzed: 12/12/2025 12:54

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 25L0244-09 C

Preparation Batch: BNL0302

Sample Size: 10 mL

Prepared: 12/12/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acetylene	74-86-2	1	1.06	ND	ug/L	U
Methane	74-82-8	1	1.31	80.0	ug/L	
Ethane	74-84-0	1	1.12	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Surrogate: Propane			62-122 %	93.1	%	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-5
25L0244-09 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/08/2025 13:28

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/16/2025 21:47

Sample Preparation:

Preparation Method: REN - EPA 3010A M

Extract ID: 25L0244-09 K 01

Preparation Batch: BNL0295

Sample Size: 25 mL

Prepared: 12/12/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	2	0.000400	ND	mg/L	U
Arsenic UCT	7440-38-2	2	0.000400	0.00342	mg/L	D
Barium	7440-39-3	2	0.00100	0.0830	mg/L	D
Cadmium UCT	7440-43-9	2	0.000200	ND	mg/L	U
Chromium	7440-47-3	2	0.00100	ND	mg/L	U
Cobalt UCT	7440-48-4	2	0.000400	0.00286	mg/L	D
Copper UCT	7440-50-8	2	0.00100	0.00506	mg/L	D
Lead	7439-92-1	2	0.000400	ND	mg/L	U
Nickel UCT	7440-02-0	2	0.00100	0.0121	mg/L	D
Selenium UCT	7782-49-2	2	0.00200	ND	mg/L	U
Silver	7440-22-4	2	0.000400	ND	mg/L	U
Thallium	7440-28-0	2	0.000400	ND	mg/L	U
Vanadium	7440-62-2	2	0.000400	0.00530	mg/L	D
Zinc UCT	7440-66-6	2	0.0120	0.0220	mg/L	D



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Project Number: 555-3820-004
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Reported:
07-Jan-2026 15:59

MW-5
25L0244-09 (Water)

Wet Chemistry

Method: EPA 350.1 M

Sampled: 12/08/2025 13:28

Instrument: LACHAT1 Analyst: GJD

Analyzed: 12/17/2025 15:16

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-09 J

Preparation Batch: BNL0363

Sample Size: 10 mL

Prepared: 12/16/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
# Ammonia-N	7664-41-7	1	0.040	0.040	ND	mg/L	U



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Project: City of Richland Horn Rapids Landfill
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Reported:
07-Jan-2026 15:59

MW-5
25L0244-09 (Water)

Wet Chemistry

Method: SM 2320 B-11

Sampled: 12/08/2025 13:28

Instrument: Accumet AB150 Analyst: LERB

Analyzed: 12/16/2025 13:47

Sample Preparation: Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-09 H

Preparation Batch: BNL0315

Sample Size: 100 mL

Prepared: 12/13/2025

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	575	mg/L CaCO3	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	575	mg/L CaCO3	



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Reported:
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MW-5
25L0244-09 (Water)

Wet Chemistry

Method: SM 2540 C-11

Sampled: 12/08/2025 13:28

Instrument: BAL2 Analyst: RAL

Analyzed: 12/12/2025 11:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-09

Preparation Batch: BNL0303

Sample Size: 75 mL

Prepared: 12/12/2025

Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	1060	mg/L	



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Reported:
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MW-5
25L0244-09 (Water)

Wet Chemistry

Method: SM 2540 D-11

Sampled: 12/08/2025 13:28

Instrument: BAL2 Analyst: RAL

Analyzed: 12/15/2025 10:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-09

Preparation Batch: BNL0330

Sample Size: 960 mL

Prepared: 12/15/2025

Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	ND	mg/L	U



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Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
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MW-5
25L0244-09RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/08/2025 13:28

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/17/2025 21:52

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Extract ID: 25L0244-09RE1 K 01

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Beryllium	7440-41-7	2	0.000400	ND	mg/L	U



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Reported:
07-Jan-2026 15:59

MW-5
25L0244-09RE1 (Water)

Wet Chemistry

Method: SM 5310 B-11

Sampled: 12/08/2025 13:28

Instrument: TOC-LCSH Analyst: RMS

Analyzed: 01/05/2026 05:12

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-09RE1 J

Preparation Batch: BNL0646

Sample Size: 20 mL

Prepared: 12/31/2025

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	35.73	mg/L	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
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MW-5
25L0244-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010D
Instrument: ICP3 Analyst: SH
Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BNL0385
Prepared: 12/17/2025
Sample Size: 25 mL
Final Volume: 25 mL
Extract ID: 25L0244-10 A 01
Sampled: 12/08/2025 13:28
Analyzed: 12/23/2025 22:20

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0500	226	mg/L	
Iron, Dissolved	7439-89-6	1	0.100	ND	mg/L	U
Magnesium, Dissolved	7439-95-4	1	0.0500	64.9	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0040	2.85	mg/L	
Potassium, Dissolved	7440-09-7	1	0.500	14.1	mg/L	
Sodium, Dissolved	7440-23-5	1	0.500	43.7	mg/L	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-6
25L0244-11 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT3 Analyst: FCL
Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BNL0268 Sample Size: 10 mL
Prepared: 12/11/2025 Final Volume: 10 mL

Sampled: 12/08/2025 14:35

Analyzed: 12/11/2025 19:22

Extract ID: 25L0244-11 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	0.83	ug/L	
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	7.66	ug/L	
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	4.37	ug/L	
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	12.3	ug/L	
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U



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Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-6
25L0244-11 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/08/2025 14:35

Instrument: NT3 Analyst: FCL

Analyzed: 12/11/2025 19:22

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			80-129 %	104	%	
Surrogate: Toluene-d8			80-120 %	96.0	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	98.6	%	
Surrogate: 1,2-Dichlorobenzene-d4			80-120 %	99.3	%	



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Reported:
07-Jan-2026 15:59

MW-6
25L0244-11 (Water)

Dissolved Gases

Method: EPA RSK-175

Sampled: 12/08/2025 14:35

Instrument: FID6 Analyst: PKC

Analyzed: 12/12/2025 13:07

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 25L0244-11 D

Preparation Batch: BNL0302

Sample Size: 10 mL

Prepared: 12/12/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acetylene	74-86-2	1	1.06	ND	ug/L	U
Methane	74-82-8	1	1.31	12.7	ug/L	
Ethane	74-84-0	1	1.12	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Surrogate: Propane			62-122 %	82.4	%	



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Reported:
07-Jan-2026 15:59

MW-6
25L0244-11 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/08/2025 14:35

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/16/2025 21:52

Sample Preparation:

Preparation Method: REN - EPA 3010A M

Extract ID: 25L0244-11 K 01

Preparation Batch: BNL0295

Sample Size: 25 mL

Prepared: 12/12/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	2	0.000400	ND	mg/L	U
Arsenic UCT	7440-38-2	2	0.000400	0.00473	mg/L	D
Barium	7440-39-3	2	0.00100	0.180	mg/L	D
Cadmium UCT	7440-43-9	2	0.000200	ND	mg/L	U
Chromium	7440-47-3	2	0.00100	0.00117	mg/L	D
Cobalt UCT	7440-48-4	2	0.000400	0.00521	mg/L	D
Copper UCT	7440-50-8	2	0.00100	0.00446	mg/L	D
Lead	7439-92-1	2	0.000400	ND	mg/L	U
Nickel UCT	7440-02-0	2	0.00100	0.00541	mg/L	D
Selenium UCT	7782-49-2	2	0.00200	ND	mg/L	U
Silver	7440-22-4	2	0.000400	ND	mg/L	U
Thallium	7440-28-0	2	0.000400	ND	mg/L	U
Vanadium	7440-62-2	2	0.000400	0.00516	mg/L	D
Zinc UCT	7440-66-6	2	0.0120	ND	mg/L	U



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MW-6
25L0244-11 (Water)

Wet Chemistry

Method: EPA 350.1 M

Sampled: 12/08/2025 14:35

Instrument: LACHAT1 Analyst: GJD

Analyzed: 12/17/2025 15:17

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-11 J

Preparation Batch: BNL0363

Sample Size: 10 mL

Prepared: 12/16/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
# Ammonia-N	7664-41-7	1	0.040	0.040	ND	mg/L	U



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Reported:
07-Jan-2026 15:59

MW-6
25L0244-11 (Water)

Wet Chemistry

Method: SM 2320 B-11

Sampled: 12/08/2025 14:35

Instrument: Accumet AB150 Analyst: LERB

Analyzed: 12/16/2025 13:47

Sample Preparation: Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-11 H

Preparation Batch: BNL0315

Sample Size: 100 mL

Prepared: 12/13/2025

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	547	mg/L CaCO3	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	547	mg/L CaCO3	



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Reported:
07-Jan-2026 15:59

MW-6
25L0244-11 (Water)

Wet Chemistry

Method: SM 2540 C-11

Sampled: 12/08/2025 14:35

Instrument: BAL2 Analyst: RAL

Analyzed: 12/12/2025 11:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-11

Preparation Batch: BNL0303

Sample Size: 50 mL

Prepared: 12/12/2025

Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	20	20	1950	mg/L	



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Reported:
07-Jan-2026 15:59

MW-6
25L0244-11 (Water)

Wet Chemistry

Method: SM 2540 D-11

Sampled: 12/08/2025 14:35

Instrument: BAL2 Analyst: RAL

Analyzed: 12/15/2025 10:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-11

Preparation Batch: BNL0330

Sample Size: 960 mL

Prepared: 12/15/2025

Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	ND	mg/L	U



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Reported:
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MW-6
25L0244-11 (Water)

Wet Chemistry

Method: SM 5310 B-11

Sampled: 12/08/2025 14:35

Instrument: TOC-LCSH Analyst: RMS

Analyzed: 01/02/2026 12:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-11 J

Preparation Batch: BNL0646

Sample Size: 20 mL

Prepared: 12/31/2025

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	46.65	mg/L	



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Reported:
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MW-6
25L0244-11RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/08/2025 14:35

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/17/2025 21:57

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Extract ID: 25L0244-11RE1 K 01

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Beryllium	7440-41-7	2	0.000400	ND	mg/L	U



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Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-6
25L0244-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010D

Sampled: 12/08/2025 14:35

Instrument: ICP3 Analyst: SH

Analyzed: 12/23/2025 22:23

Sample Preparation:

Preparation Method: WMN (No Prep)

Extract ID: 25L0244-12 A 01

Preparation Batch: BNL0385

Sample Size: 25 mL

Prepared: 12/17/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0500	407	mg/L	
Iron, Dissolved	7439-89-6	1	0.100	ND	mg/L	U
Magnesium, Dissolved	7439-95-4	1	0.0500	109	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0040	0.588	mg/L	
Potassium, Dissolved	7440-09-7	1	0.500	18.9	mg/L	
Sodium, Dissolved	7440-23-5	1	0.500	48.9	mg/L	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
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MW-8
25L0244-13 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT3 Analyst: FCL
Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BNL0268 Sample Size: 10 mL
Prepared: 12/11/2025 Final Volume: 10 mL
Extract ID: 25L0244-13 A
Sampled: 12/09/2025 12:30
Analyzed: 12/11/2025 19:44

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	0.82	ug/L	
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.75	ug/L	
Chloroform	67-66-3	1	0.20	9.37	ug/L	
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	0.66	ug/L	
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U



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Project: City of Richland Horn Rapids Landfill
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Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-8
25L0244-13 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/09/2025 12:30

Instrument: NT3 Analyst: FCL

Analyzed: 12/11/2025 19:44

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			80-129 %	104	%	
Surrogate: Toluene-d8			80-120 %	95.9	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	96.3	%	
Surrogate: 1,2-Dichlorobenzene-d4			80-120 %	99.3	%	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-8
25L0244-13 (Water)

Dissolved Gases

Method: EPA RSK-175

Sampled: 12/09/2025 12:30

Instrument: FID6 Analyst: PKC

Analyzed: 12/12/2025 13:20

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 25L0244-13 E

Preparation Batch: BNL0302

Sample Size: 10 mL

Prepared: 12/12/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acetylene	74-86-2	1	1.06	ND	ug/L	U
Methane	74-82-8	1	1.31	ND	ug/L	U
Ethane	74-84-0	1	1.12	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Surrogate: Propane			62-122 %	113	%	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-8
25L0244-13 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 12:30

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/16/2025 20:31

Sample Preparation:

Preparation Method: REN - EPA 3010A M

Extract ID: 25L0244-13 K 01

Preparation Batch: BNL0295

Sample Size: 25 mL

Prepared: 12/12/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	2	0.000400	ND	mg/L	U
Arsenic UCT	7440-38-2	2	0.000400	0.00722	mg/L	D
Barium	7440-39-3	2	0.00100	0.0444	mg/L	D
Cadmium UCT	7440-43-9	2	0.000200	ND	mg/L	U
Cobalt UCT	7440-48-4	2	0.000400	ND	mg/L	U
Copper UCT	7440-50-8	2	0.00100	ND	mg/L	U
Lead	7439-92-1	2	0.000400	ND	mg/L	U
Nickel UCT	7440-02-0	2	0.00100	0.00208	mg/L	D
Selenium UCT	7782-49-2	2	0.00200	ND	mg/L	U
Silver	7440-22-4	2	0.000400	ND	mg/L	U
Thallium	7440-28-0	2	0.000400	ND	mg/L	U
Zinc UCT	7440-66-6	2	0.0120	ND	mg/L	U



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-8
25L0244-13 (Water)

Wet Chemistry

Method: EPA 350.1 M

Sampled: 12/09/2025 12:30

Instrument: LACHAT1 Analyst: GJD

Analyzed: 12/17/2025 15:10

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-13 J

Preparation Batch: BNL0363

Sample Size: 10 mL

Prepared: 12/16/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
# Ammonia-N	7664-41-7	1	0.040	0.040	ND	mg/L	U



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719 2nd Avenue, Suite 200
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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-8
25L0244-13 (Water)

Wet Chemistry

Method: SM 2320 B-11

Sampled: 12/09/2025 12:30

Instrument: Accumet AB150 Analyst: LERB

Analyzed: 12/16/2025 13:47

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-13 H

Preparation Batch: BNL0316

Sample Size: 100 mL

Prepared: 12/13/2025

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	174	mg/L CaCO3	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	174	mg/L CaCO3	



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Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-8
25L0244-13 (Water)

Wet Chemistry

Method: SM 2540 C-11

Sampled: 12/09/2025 12:30

Instrument: BAL2 Analyst: RAL

Analyzed: 12/12/2025 11:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-13

Preparation Batch: BNL0303

Sample Size: 100 mL

Prepared: 12/12/2025

Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	372	mg/L	



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Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-8
25L0244-13 (Water)

Wet Chemistry

Method: SM 2540 D-11

Sampled: 12/09/2025 12:30

Instrument: BAL2 Analyst: RAL

Analyzed: 12/15/2025 10:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-13

Preparation Batch: BNL0330

Sample Size: 470 mL

Prepared: 12/15/2025

Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	2	2	ND	mg/L	U



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Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-8
25L0244-13 (Water)

Wet Chemistry

Method: SM 5310 B-11

Sampled: 12/09/2025 12:30

Instrument: TOC-LCSH Analyst: RMS

Analyzed: 01/02/2026 12:46

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-13 J

Preparation Batch: BNL0646

Sample Size: 20 mL

Prepared: 12/31/2025

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	10.09	mg/L	



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Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-8
25L0244-13RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 12:30

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/19/2025 15:10

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 25L0244-13RE1 K 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Beryllium	7440-41-7	2	0.000400	ND	mg/L	U
Chromium	7440-47-3	2	0.00100	0.00309	mg/L	D



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Project Manager: Lisa Gilbert

Reported:
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MW-8
25L0244-13RE2 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 12:30

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/22/2025 22:33

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Extract ID: 25L0244-13RE2 K 01

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vanadium	7440-62-2	2	0.000400	0.0129	mg/L	D



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Reported:
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MW-8
25L0244-14 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010D

Sampled: 12/09/2025 12:30

Instrument: ICP3 Analyst: SH

Analyzed: 12/23/2025 22:34

Sample Preparation:

Preparation Method: WMN (No Prep)

Extract ID: 25L0244-14 A 01

Preparation Batch: BNL0385

Sample Size: 25 mL

Prepared: 12/17/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0500	77.1	mg/L	
Iron, Dissolved	7439-89-6	1	0.100	ND	mg/L	U
Magnesium, Dissolved	7439-95-4	1	0.0500	16.1	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0040	ND	mg/L	U
Potassium, Dissolved	7440-09-7	1	0.500	7.68	mg/L	
Sodium, Dissolved	7440-23-5	1	0.500	19.9	mg/L	



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Reported:
07-Jan-2026 15:59

MW-9
25L0244-15 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT3 Analyst: FCL
Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BNL0268 Sample Size: 10 mL
Prepared: 12/11/2025 Final Volume: 10 mL
Extract ID: 25L0244-15 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	0.25	ug/L	
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	1.12	ug/L	
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	7.48	ug/L	
Chloroform	67-66-3	1	0.20	1.12	ug/L	
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	3.62	ug/L	
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	10.1	ug/L	
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U



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Reported:
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MW-9
25L0244-15 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/09/2025 11:25

Instrument: NT3 Analyst: FCL

Analyzed: 12/11/2025 20:06

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			80-129 %	101	%	
Surrogate: Toluene-d8			80-120 %	94.2	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	95.1	%	
Surrogate: 1,2-Dichlorobenzene-d4			80-120 %	102	%	



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Reported:
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MW-9
25L0244-15 (Water)

Dissolved Gases

Method: EPA RSK-175

Sampled: 12/09/2025 11:25

Instrument: FID6 Analyst: PKC

Analyzed: 12/12/2025 14:25

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 25L0244-15 C

Preparation Batch: BNL0302

Sample Size: 10 mL

Prepared: 12/12/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acetylene	74-86-2	1	1.06	ND	ug/L	U
Methane	74-82-8	1	1.31	3.66	ug/L	
Ethane	74-84-0	1	1.12	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Surrogate: Propane			62-122 %	107	%	



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Reported:
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MW-9
25L0244-15 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 11:25

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/16/2025 21:57

Sample Preparation:

Preparation Method: REN - EPA 3010A M

Extract ID: 25L0244-15 K 01

Preparation Batch: BNL0295

Sample Size: 25 mL

Prepared: 12/12/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	2	0.000400	ND	mg/L	U
Arsenic UCT	7440-38-2	2	0.000400	0.00171	mg/L	D
Barium	7440-39-3	2	0.00100	0.0727	mg/L	D
Cadmium UCT	7440-43-9	2	0.000200	ND	mg/L	U
Chromium	7440-47-3	2	0.00100	0.00208	mg/L	D
Cobalt UCT	7440-48-4	2	0.000400	ND	mg/L	U
Copper UCT	7440-50-8	2	0.00100	ND	mg/L	U
Lead	7439-92-1	2	0.000400	ND	mg/L	U
Nickel UCT	7440-02-0	2	0.00100	0.00154	mg/L	D
Selenium UCT	7782-49-2	2	0.00200	ND	mg/L	U
Silver	7440-22-4	2	0.000400	ND	mg/L	U
Thallium	7440-28-0	2	0.000400	ND	mg/L	U
Vanadium	7440-62-2	2	0.000400	0.00584	mg/L	D
Zinc UCT	7440-66-6	2	0.0120	ND	mg/L	U



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Reported:
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MW-9
25L0244-15 (Water)

Wet Chemistry

Method: EPA 350.1 M

Sampled: 12/09/2025 11:25

Instrument: LCHAT1 Analyst: GJD

Analyzed: 12/17/2025 15:25

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-15 J

Preparation Batch: BNL0363

Sample Size: 10 mL

Prepared: 12/16/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
# Ammonia-N	7664-41-7	1	0.040	0.040	ND	mg/L	U



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Reported:
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MW-9
25L0244-15 (Water)

Wet Chemistry

Method: SM 2320 B-11

Sampled: 12/09/2025 11:25

Instrument: Accumet AB150 Analyst: LERB

Analyzed: 12/16/2025 13:47

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-15 H

Preparation Batch: BNL0315

Sample Size: 100 mL

Prepared: 12/13/2025

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	363	mg/L CaCO3	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	363	mg/L CaCO3	



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Reported:
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MW-9
25L0244-15 (Water)

Wet Chemistry

Method: SM 2540 C-11

Sampled: 12/09/2025 11:25

Instrument: BAL2 Analyst: RAL

Analyzed: 12/12/2025 11:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-15

Preparation Batch: BNL0303

Sample Size: 100 mL

Prepared: 12/12/2025

Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	605	mg/L	



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Reported:
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MW-9
25L0244-15 (Water)

Wet Chemistry

Method: SM 2540 D-11

Sampled: 12/09/2025 11:25

Instrument: BAL2 Analyst: RAL

Analyzed: 12/15/2025 10:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-15

Preparation Batch: BNL0330

Sample Size: 960 mL

Prepared: 12/15/2025

Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	ND	mg/L	U



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Reported:
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MW-9
25L0244-15 (Water)

Wet Chemistry

Method: SM 5310 B-11

Sampled: 12/09/2025 11:25

Instrument: TOC-LCSH Analyst: RMS

Analyzed: 01/02/2026 14:21

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-15 J

Preparation Batch: BNL0646

Sample Size: 20 mL

Prepared: 12/31/2025

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	24.96	mg/L	



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MW-9
25L0244-15RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 11:25

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/17/2025 22:02

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 25L0244-15RE1 K 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Beryllium	7440-41-7	2	0.000400	ND	mg/L	U



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Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
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MW-9
25L0244-16 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010D

Sampled: 12/09/2025 11:25

Instrument: ICP3 Analyst: SH

Analyzed: 12/23/2025 22:37

Sample Preparation:

Preparation Method: WMN (No Prep)

Extract ID: 25L0244-16 A 01

Preparation Batch: BNL0385

Sample Size: 25 mL

Prepared: 12/17/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0500	141	mg/L	
Iron, Dissolved	7439-89-6	1	0.100	ND	mg/L	U
Magnesium, Dissolved	7439-95-4	1	0.0500	32.7	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0040	ND	mg/L	U
Potassium, Dissolved	7440-09-7	1	0.500	9.55	mg/L	
Sodium, Dissolved	7440-23-5	1	0.500	25.1	mg/L	



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Reported:
07-Jan-2026 15:59

MW-10
25L0244-17 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT3 Analyst: FCL
Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BNL0268 Sample Size: 10 mL
Prepared: 12/11/2025 Final Volume: 10 mL

Sampld: 12/08/2025 12:00
Analyzed: 12/11/2025 20:28
Extract ID: 25L0244-17 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	1.54	ug/L	
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	6.68	ug/L	
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	0.25	ug/L	
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	1.85	ug/L	
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	3.66	ug/L	
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U



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719 2nd Avenue, Suite 200
Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-10
25L0244-17 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/08/2025 12:00

Instrument: NT3 Analyst: FCL

Analyzed: 12/11/2025 20:28

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			80-129 %	104	%	
Surrogate: Toluene-d8			80-120 %	96.8	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	98.9	%	
Surrogate: 1,2-Dichlorobenzene-d4			80-120 %	104	%	



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Reported:
07-Jan-2026 15:59

MW-10
25L0244-17 (Water)

Dissolved Gases

Method: EPA RSK-175

Sampled: 12/08/2025 12:00

Instrument: FID6 Analyst: PKC

Analyzed: 12/12/2025 14:39

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 25L0244-17 C

Preparation Batch: BNL0302

Sample Size: 10 mL

Prepared: 12/12/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acetylene	74-86-2	1	1.06	ND	ug/L	U
Methane	74-82-8	1	1.31	163	ug/L	
Ethane	74-84-0	1	1.12	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Surrogate: Propane			62-122 %	88.3	%	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-10
25L0244-17 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/08/2025 12:00

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/16/2025 22:02

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 25L0244-17 K 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	2	0.000400	ND	mg/L	U
Arsenic UCT	7440-38-2	2	0.000400	0.00343	mg/L	D
Barium	7440-39-3	2	0.00100	0.176	mg/L	D
Cadmium UCT	7440-43-9	2	0.000200	ND	mg/L	U
Chromium	7440-47-3	2	0.00100	0.00196	mg/L	D
Cobalt UCT	7440-48-4	2	0.000400	0.00147	mg/L	D
Copper UCT	7440-50-8	2	0.00100	0.00461	mg/L	D
Lead	7439-92-1	2	0.000400	ND	mg/L	U
Nickel UCT	7440-02-0	2	0.00100	0.00550	mg/L	D
Selenium UCT	7782-49-2	2	0.00200	ND	mg/L	U
Silver	7440-22-4	2	0.000400	ND	mg/L	U
Thallium	7440-28-0	2	0.000400	ND	mg/L	U
Vanadium	7440-62-2	2	0.000400	0.00425	mg/L	D
Zinc UCT	7440-66-6	2	0.0120	ND	mg/L	U



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Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-10
25L0244-17 (Water)

Wet Chemistry

Method: EPA 350.1 M

Sampled: 12/08/2025 12:00

Instrument: LACHAT1 Analyst: GJD

Analyzed: 12/17/2025 15:26

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-17 J

Preparation Batch: BNL0363

Sample Size: 10 mL

Prepared: 12/16/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
# Ammonia-N	7664-41-7	1	0.040	0.040	0.081	mg/L	



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Reported:
07-Jan-2026 15:59

MW-10
25L0244-17 (Water)

Wet Chemistry

Method: SM 2320 B-11

Sampled: 12/08/2025 12:00

Instrument: Accumet AB150 Analyst: LERB

Analyzed: 12/16/2025 13:47

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-17 H

Preparation Batch: BNL0315

Sample Size: 100 mL

Prepared: 12/13/2025

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	665	mg/L CaCO3	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	665	mg/L CaCO3	



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Reported:
07-Jan-2026 15:59

MW-10
25L0244-17 (Water)

Wet Chemistry

Method: SM 2540 C-11

Sampled: 12/08/2025 12:00

Instrument: BAL2 Analyst: RAL

Analyzed: 12/12/2025 11:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-17

Preparation Batch: BNL0303

Sample Size: 75 mL

Prepared: 12/12/2025

Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	1400	mg/L	



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Reported:
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MW-10
25L0244-17 (Water)

Wet Chemistry

Method: SM 2540 D-11

Sampled: 12/08/2025 12:00

Instrument: BAL2 Analyst: RAL

Analyzed: 12/15/2025 10:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-17

Preparation Batch: BNL0330

Sample Size: 960 mL

Prepared: 12/15/2025

Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	ND	mg/L	U



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Reported:
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MW-10
25L0244-17 (Water)

Wet Chemistry

Method: SM 5310 B-11

Sampled: 12/08/2025 12:00

Instrument: TOC-LCSH Analyst: RMS

Analyzed: 01/02/2026 14:40

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-17 J

Preparation Batch: BNL0646

Sample Size: 20 mL

Prepared: 12/31/2025

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	55.85	mg/L	



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Reported:
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MW-10
25L0244-17RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/08/2025 12:00

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/17/2025 22:07

Sample Preparation: Preparation Method: REN - EPA 3010A M

Extract ID: 25L0244-17RE1 K 01

Preparation Batch: BNL0295

Sample Size: 25 mL

Prepared: 12/12/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Beryllium	7440-41-7	2	0.000400	ND	mg/L	U



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Reported:
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MW-10
25L0244-18 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010D
Instrument: ICP3 Analyst: SH
Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BNL0385
Prepared: 12/17/2025
Sample Size: 25 mL
Final Volume: 25 mL
Extract ID: 25L0244-18 A 01
Sampled: 12/08/2025 12:00
Analyzed: 12/23/2025 22:40

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0500	349	mg/L	
Iron, Dissolved	7439-89-6	1	0.100	0.319	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0500	78.1	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0040	0.553	mg/L	
Potassium, Dissolved	7440-09-7	1	0.500	16.4	mg/L	
Sodium, Dissolved	7440-23-5	1	0.500	31.9	mg/L	



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Reported:
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MW-11
25L0244-19 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT3 Analyst: FCL
Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BNL0268 Sample Size: 10 mL
Prepared: 12/11/2025 Final Volume: 10 mL

Sampled: 12/09/2025 15:50

Analyzed: 12/11/2025 20:50

Extract ID: 25L0244-19 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U



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Reported:
07-Jan-2026 15:59

MW-11
25L0244-19 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/09/2025 15:50

Instrument: NT3 Analyst: FCL

Analyzed: 12/11/2025 20:50

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			80-129 %	105	%	
Surrogate: Toluene-d8			80-120 %	96.6	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	99.6	%	
Surrogate: 1,2-Dichlorobenzene-d4			80-120 %	100	%	



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Reported:
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MW-11
25L0244-19 (Water)

Dissolved Gases

Method: EPA RSK-175

Sampled: 12/09/2025 15:50

Instrument: FID6 Analyst: PKC

Analyzed: 12/12/2025 14:52

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 25L0244-19 D

Preparation Batch: BNL0302

Sample Size: 10 mL

Prepared: 12/12/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acetylene	74-86-2	1	1.06	ND	ug/L	U
Methane	74-82-8	1	1.31	ND	ug/L	U
Ethane	74-84-0	1	1.12	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Surrogate: Propane			62-122 %	102	%	



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Reported:
07-Jan-2026 15:59

MW-11
25L0244-19 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 15:50

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/16/2025 22:07

Sample Preparation:

Preparation Method: REN - EPA 3010A M

Extract ID: 25L0244-19 K 01

Preparation Batch: BNL0295

Sample Size: 25 mL

Prepared: 12/12/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	2	0.000400	ND	mg/L	U
Arsenic UCT	7440-38-2	2	0.000400	0.00400	mg/L	D
Barium	7440-39-3	2	0.00100	0.0811	mg/L	D
Cadmium UCT	7440-43-9	2	0.000200	ND	mg/L	U
Chromium	7440-47-3	2	0.00100	0.0131	mg/L	D
Cobalt UCT	7440-48-4	2	0.000400	0.000440	mg/L	D
Copper UCT	7440-50-8	2	0.00100	0.0103	mg/L	D
Lead	7439-92-1	2	0.000400	ND	mg/L	U
Nickel UCT	7440-02-0	2	0.00100	0.00813	mg/L	D
Selenium UCT	7782-49-2	2	0.00200	0.00450	mg/L	D
Silver	7440-22-4	2	0.000400	ND	mg/L	U
Thallium	7440-28-0	2	0.000400	ND	mg/L	U
Vanadium	7440-62-2	2	0.000400	0.00802	mg/L	D
Zinc UCT	7440-66-6	2	0.0120	ND	mg/L	U



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Reported:
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MW-11
25L0244-19 (Water)

Wet Chemistry

Method: EPA 350.1 M

Sampled: 12/09/2025 15:50

Instrument: LCHAT1 Analyst: GJD

Analyzed: 12/17/2025 15:27

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-19 J

Preparation Batch: BNL0363

Sample Size: 10 mL

Prepared: 12/16/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
# Ammonia-N	7664-41-7	1	0.040	0.040	ND	mg/L	U



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Reported:
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MW-11
25L0244-19 (Water)

Wet Chemistry

Method: SM 2320 B-11

Sampled: 12/09/2025 15:50

Instrument: Accumet AB150 Analyst: LERB

Analyzed: 12/16/2025 13:47

Sample Preparation: Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-19 H

Preparation Batch: BNL0315

Sample Size: 100 mL

Prepared: 12/13/2025

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	161	mg/L CaCO3	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	161	mg/L CaCO3	



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Reported:
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MW-11
25L0244-19 (Water)

Wet Chemistry

Method: SM 2540 C-11

Sampled: 12/09/2025 15:50

Instrument: BAL2 Analyst: RAL

Analyzed: 12/12/2025 11:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-19

Preparation Batch: BNL0303

Sample Size: 75 mL

Prepared: 12/12/2025

Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	1310	mg/L	



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Reported:
07-Jan-2026 15:59

MW-11
25L0244-19 (Water)

Wet Chemistry

Method: SM 2540 D-11

Sampled: 12/09/2025 15:50

Instrument: BAL2 Analyst: RAL

Analyzed: 12/15/2025 10:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-19

Preparation Batch: BNL0330

Sample Size: 970 mL

Prepared: 12/15/2025

Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	4	mg/L	



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Reported:
07-Jan-2026 15:59

MW-11
25L0244-19 (Water)

Wet Chemistry

Method: SM 5310 B-11

Sampled: 12/09/2025 15:50

Instrument: TOC-LCSH Analyst: RMS

Analyzed: 01/02/2026 14:58

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-19 J

Preparation Batch: BNL0646

Sample Size: 20 mL

Prepared: 12/31/2025

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	13.92	mg/L	



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Reported:
07-Jan-2026 15:59

MW-11
25L0244-19RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 15:50

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/17/2025 22:59

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 25L0244-19RE1 K 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Beryllium	7440-41-7	2	0.000400	ND	mg/L	U



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-11
25L0244-20 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010D

Sampled: 12/09/2025 15:50

Instrument: ICP3 Analyst: SH

Analyzed: 12/23/2025 22:43

Sample Preparation:

Preparation Method: WMN (No Prep)

Extract ID: 25L0244-20 A 01

Preparation Batch: BNL0385

Sample Size: 25 mL

Prepared: 12/17/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0500	273	mg/L	
Iron, Dissolved	7439-89-6	1	0.100	ND	mg/L	U
Magnesium, Dissolved	7439-95-4	1	0.0500	59.3	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0040	ND	mg/L	U
Potassium, Dissolved	7440-09-7	1	0.500	12.5	mg/L	
Sodium, Dissolved	7440-23-5	1	0.500	21.5	mg/L	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-12
25L0244-21 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT3 Analyst: FCL
Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BNL0268
Prepared: 12/11/2025
Sample Size: 10 mL
Final Volume: 10 mL
Extract ID: 25L0244-21 A
Sampled: 12/09/2025 10:30
Analyzed: 12/11/2025 21:12

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	1.65	ug/L	
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	1.81	ug/L	
Chloroform	67-66-3	1	0.20	0.46	ug/L	
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U



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Project Manager: Lisa Gilbert

Reported:
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MW-12
25L0244-21 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/09/2025 10:30

Instrument: NT3 Analyst: FCL

Analyzed: 12/11/2025 21:12

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			80-129 %	101	%	
Surrogate: Toluene-d8			80-120 %	96.7	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	97.5	%	
Surrogate: 1,2-Dichlorobenzene-d4			80-120 %	98.8	%	



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Reported:
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MW-12
25L0244-21 (Water)

Dissolved Gases

Method: EPA RSK-175

Sampled: 12/09/2025 10:30

Instrument: FID6 Analyst: PKC

Analyzed: 12/12/2025 15:05

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 25L0244-21 D

Preparation Batch: BNL0302

Sample Size: 10 mL

Prepared: 12/12/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acetylene	74-86-2	1	1.06	ND	ug/L	U
Methane	74-82-8	1	1.31	ND	ug/L	U
Ethane	74-84-0	1	1.12	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Surrogate: Propane			62-122 %	109	%	



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Reported:
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MW-12
25L0244-21 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 10:30

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/16/2025 22:31

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 25L0244-21 K 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic UCT	7440-38-2	2	0.000400	0.00587	mg/L	D
Barium	7440-39-3	2	0.00100	0.0533	mg/L	D
Cadmium UCT	7440-43-9	2	0.000200	ND	mg/L	U
Chromium	7440-47-3	2	0.00100	0.0114	mg/L	D
Cobalt UCT	7440-48-4	2	0.000400	0.00670	mg/L	D
Copper UCT	7440-50-8	2	0.00100	0.00858	mg/L	D
Lead	7439-92-1	2	0.000400	0.000432	mg/L	D
Nickel UCT	7440-02-0	2	0.00100	0.0122	mg/L	D
Selenium UCT	7782-49-2	2	0.00200	ND	mg/L	U
Silver	7440-22-4	2	0.000400	ND	mg/L	U
Thallium	7440-28-0	2	0.000400	ND	mg/L	U
Vanadium	7440-62-2	2	0.000400	0.0114	mg/L	D
Zinc UCT	7440-66-6	2	0.0120	ND	mg/L	U



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Reported:
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MW-12
25L0244-21 (Water)

Wet Chemistry

Method: EPA 350.1 M

Sampled: 12/09/2025 10:30

Instrument: LACHAT1 Analyst: GJD

Analyzed: 12/17/2025 15:29

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-21 J

Preparation Batch: BNL0363

Sample Size: 10 mL

Prepared: 12/16/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
# Ammonia-N	7664-41-7	1	0.040	0.040	ND	mg/L	U



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Reported:
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MW-12
25L0244-21 (Water)

Wet Chemistry

Method: SM 2320 B-11

Sampled: 12/09/2025 10:30

Instrument: Accumet AB150 Analyst: LERB

Analyzed: 12/16/2025 13:47

Sample Preparation: Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-21 H

Preparation Batch: BNL0315

Sample Size: 100 mL

Prepared: 12/13/2025

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	206	mg/L CaCO3	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	206	mg/L CaCO3	



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Reported:
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MW-12
25L0244-21 (Water)

Wet Chemistry

Method: SM 2540 C-11

Sampled: 12/09/2025 10:30

Instrument: BAL2 Analyst: RAL

Analyzed: 12/12/2025 11:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-21

Preparation Batch: BNL0303

Sample Size: 100 mL

Prepared: 12/12/2025

Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	334	mg/L	



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Reported:
07-Jan-2026 15:59

MW-12
25L0244-21 (Water)

Wet Chemistry

Method: SM 2540 D-11

Sampled: 12/09/2025 10:30

Instrument: BAL2 Analyst: RAL

Analyzed: 12/15/2025 10:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-21

Preparation Batch: BNL0330

Sample Size: 560 mL

Prepared: 12/15/2025

Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	2	2	45	mg/L	



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Reported:
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MW-12
25L0244-21 (Water)

Wet Chemistry

Method: SM 5310 B-11

Sampled: 12/09/2025 10:30

Instrument: TOC-LCSH Analyst: RMS

Analyzed: 01/02/2026 15:16

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-21 J

Preparation Batch: BNL0646

Sample Size: 20 mL

Prepared: 12/31/2025

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	11.79	mg/L	



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Reported:
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MW-12
25L0244-21RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/09/2025 10:30

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/17/2025 23:04

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 25L0244-21RE1 K 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	2	0.000400	ND	mg/L	U
Beryllium	7440-41-7	2	0.000400	ND	mg/L	U



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Project Manager: Lisa Gilbert

Reported:
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MW-12
25L0244-22 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010D

Sampled: 12/09/2025 10:30

Instrument: ICP3 Analyst: SH

Analyzed: 12/23/2025 22:46

Sample Preparation:

Preparation Method: WMN (No Prep)

Extract ID: 25L0244-22 A 01

Preparation Batch: BNL0385

Sample Size: 25 mL

Prepared: 12/17/2025

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0500	74.3	mg/L	
Iron, Dissolved	7439-89-6	1	0.100	ND	mg/L	U
Magnesium, Dissolved	7439-95-4	1	0.0500	13.4	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0040	ND	mg/L	U
Potassium, Dissolved	7440-09-7	1	0.500	7.81	mg/L	
Sodium, Dissolved	7440-23-5	1	0.500	21.5	mg/L	



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Reported:
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MW-21
25L0244-23 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT3 Analyst: FCL
Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BNL0306
Prepared: 12/12/2025
Sample Size: 10 mL
Final Volume: 10 mL
Extract ID: 25L0244-23 A
Sampled: 12/08/2025 11:00
Analyzed: 12/12/2025 15:36

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	0.24	ug/L	
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	0.22	ug/L	
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	1.72	ug/L	
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	12.6	ug/L	
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	0.27	ug/L	
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	3.05	ug/L	
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	7.26	ug/L	
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-21
25L0244-23 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/08/2025 11:00

Instrument: NT3 Analyst: FCL

Analyzed: 12/12/2025 15:36

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			80-129 %	101	%	
Surrogate: Toluene-d8			80-120 %	96.9	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	102	%	
Surrogate: 1,2-Dichlorobenzene-d4			80-120 %	103	%	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-21
25L0244-23 (Water)

Dissolved Gases

Method: EPA RSK-175

Sampled: 12/08/2025 11:00

Instrument: FID6 Analyst: PKC

Analyzed: 12/12/2025 15:18

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 25L0244-23 D

Preparation Batch: BNL0302

Sample Size: 10 mL

Prepared: 12/12/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acetylene	74-86-2	1	1.06	ND	ug/L	U
Methane	74-82-8	1	1.31	82.8	ug/L	
Ethane	74-84-0	1	1.12	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Surrogate: Propane			62-122 %	94.7	%	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-21
25L0244-23 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/08/2025 11:00

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/16/2025 22:36

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 25L0244-23 K 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic UCT	7440-38-2	2	0.000400	0.00346	mg/L	D
Barium	7440-39-3	2	0.00100	0.0805	mg/L	D
Cadmium UCT	7440-43-9	2	0.000200	ND	mg/L	U
Chromium	7440-47-3	2	0.00100	ND	mg/L	U
Cobalt UCT	7440-48-4	2	0.000400	0.00278	mg/L	D
Copper UCT	7440-50-8	2	0.00100	0.00527	mg/L	D
Lead	7439-92-1	2	0.000400	ND	mg/L	U
Nickel UCT	7440-02-0	2	0.00100	0.0119	mg/L	D
Selenium UCT	7782-49-2	2	0.00200	ND	mg/L	U
Silver	7440-22-4	2	0.000400	ND	mg/L	U
Thallium	7440-28-0	2	0.000400	ND	mg/L	U
Vanadium	7440-62-2	2	0.000400	0.00519	mg/L	D
Zinc UCT	7440-66-6	2	0.0120	0.0216	mg/L	D



Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-21
25L0244-23 (Water)

Wet Chemistry

Method: EPA 350.1 M

Sampled: 12/08/2025 11:00

Instrument: LCHAT1 Analyst: GJD

Analyzed: 12/17/2025 15:30

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-23 J

Preparation Batch: BNL0363

Sample Size: 10 mL

Prepared: 12/16/2025

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
# Ammonia-N	7664-41-7	1	0.040	0.040	ND	mg/L	U



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Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-21
25L0244-23 (Water)

Wet Chemistry

Method: SM 2320 B-11

Sampled: 12/08/2025 11:00

Instrument: Accumet AB150 Analyst: LERB

Analyzed: 12/16/2025 13:47

Sample Preparation: Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-23 H

Preparation Batch: BNL0315

Sample Size: 100 mL

Prepared: 12/13/2025

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	582	mg/L CaCO3	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	582	mg/L CaCO3	



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Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-21
25L0244-23 (Water)

Wet Chemistry

Method: SM 2540 C-11

Sampled: 12/08/2025 11:00

Instrument: BAL2 Analyst: RAL

Analyzed: 12/12/2025 11:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-23

Preparation Batch: BNL0303

Sample Size: 75 mL

Prepared: 12/12/2025

Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	1030	mg/L	



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Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-21
25L0244-23 (Water)

Wet Chemistry

Method: SM 2540 D-11

Sampled: 12/08/2025 11:00

Instrument: BAL2 Analyst: RAL

Analyzed: 12/15/2025 10:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-23

Preparation Batch: BNL0330

Sample Size: 970 mL

Prepared: 12/15/2025

Final Volume: 1000 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Suspended Solids		1	1	1	ND	mg/L	U



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Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

MW-21
25L0244-23RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/08/2025 11:00

Instrument: ICPMS1 Analyst: HAL

Analyzed: 12/17/2025 23:09

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BNL0295
Prepared: 12/12/2025

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 25L0244-23RE1 K 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	2	0.000400	ND	mg/L	U
Beryllium	7440-41-7	2	0.000400	ND	mg/L	U



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Reported:
07-Jan-2026 15:59

MW-21
25L0244-23RE1 (Water)

Wet Chemistry

Method: SM 5310 B-11

Sampled: 12/08/2025 11:00

Instrument: TOC-LCSH Analyst: RMS

Analyzed: 01/05/2026 05:30

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 25L0244-23RE1 J

Preparation Batch: BNL0646

Sample Size: 20 mL

Prepared: 12/31/2025

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	37.78	mg/L	



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Reported:
07-Jan-2026 15:59

MW-21
25L0244-24 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010D
Instrument: ICP3 Analyst: SH
Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BNL0385
Prepared: 12/17/2025
Sample Size: 25 mL
Final Volume: 25 mL
Extract ID: 25L0244-24 A 01
Sampled: 12/08/2025 11:00
Analyzed: 12/23/2025 23:23

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0500	218	mg/L	
Iron, Dissolved	7439-89-6	1	0.100	ND	mg/L	U
Magnesium, Dissolved	7439-95-4	1	0.0500	62.9	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0040	2.77	mg/L	
Potassium, Dissolved	7440-09-7	1	0.500	13.8	mg/L	
Sodium, Dissolved	7440-23-5	1	0.500	42.4	mg/L	



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Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Trip Blanks
25L0244-25 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT3 Analyst: FCL
Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BNL0268
Prepared: 12/11/2025
Sample Size: 10 mL
Final Volume: 10 mL
Extract ID: 25L0244-25 A
Sampled: 12/08/2025 11:00
Analyzed: 12/11/2025 14:12

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Trip Blanks
25L0244-25 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/08/2025 11:00

Instrument: NT3 Analyst: FCL

Analyzed: 12/11/2025 14:12

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			80-129 %	98.8	%	
Surrogate: Toluene-d8			80-120 %	96.9	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	95.4	%	
Surrogate: 1,2-Dichlorobenzene-d4			80-120 %	101	%	



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BNL0268 - EPA 8260D in Water

Instrument: NT3 Analyst: FCL

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0268-BLK1)				Prepared: 11-Dec-2025 Analyzed: 11-Dec-2025 13:50						
Chloromethane	ND	0.50	ug/L							U
Vinyl Chloride	ND	0.20	ug/L							U
Bromomethane	ND	1.00	ug/L							U
Chloroethane	ND	0.20	ug/L							U
Trichlorofluoromethane	ND	0.20	ug/L							U
Acetone	ND	5.00	ug/L							U
1,1-Dichloroethene	ND	0.20	ug/L							U
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.20	ug/L							U
Vinyl Acetate	ND	0.20	ug/L							U
1,1-Dichloroethane	ND	0.20	ug/L							U
2-Butanone	ND	5.00	ug/L							U
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Chloroform	ND	0.20	ug/L							U
Bromochloromethane	ND	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.20	ug/L							U
Carbon tetrachloride	ND	0.20	ug/L							U
1,2-Dichloroethane	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Trichloroethene	ND	0.20	ug/L							U
1,2-Dichloropropane	ND	0.20	ug/L							U
Bromodichloromethane	ND	0.20	ug/L							U
Dibromomethane	ND	0.20	ug/L							U
4-Methyl-2-Pentanone	ND	5.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.20	ug/L							U
Toluene	ND	0.20	ug/L							U
trans-1,3-Dichloropropene	ND	0.20	ug/L							U
2-Hexanone	ND	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.20	ug/L							U
Tetrachloroethene	ND	0.20	ug/L							U
Dibromochloromethane	ND	0.20	ug/L							U
1,2-Dibromoethane	ND	0.20	ug/L							U
Chlorobenzene	ND	0.20	ug/L							U
Ethylbenzene	ND	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.20	ug/L							U
m,p-Xylene	ND	0.40	ug/L							U
o-Xylene	ND	0.20	ug/L							U
Styrene	ND	0.20	ug/L							U



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BNL0268 - EPA 8260D in Water

Instrument: NT3 Analyst: FCL

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0268-BLK1)										
Prepared: 11-Dec-2025 Analyzed: 11-Dec-2025 13:50										
Bromoform	ND	0.20	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.50	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	1.00	ug/L							U
1,4-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.50	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	6.18		ug/L	6.25		98.9	80-129			
Surrogate: Toluene-d8	6.01		ug/L	6.25		96.1	80-120			
Surrogate: 4-Bromofluorobenzene	5.89		ug/L	6.25		94.3	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.07		ug/L	5.00		101	80-120			
LCS (BNL0268-BS1)										
Prepared: 11-Dec-2025 Analyzed: 11-Dec-2025 12:06										
Chloromethane	9.19	0.50	ug/L	10.0		91.9	60-138			
Vinyl Chloride	10.2	0.20	ug/L	10.0		102	66-133			
Bromomethane	10.2	1.00	ug/L	10.0		102	72-131			
Chloroethane	10.7	0.20	ug/L	10.0		107	60-155			
Trichlorofluoromethane	10.6	0.20	ug/L	10.0		106	62-141			
Acetone	47.4	5.00	ug/L	50.0		94.7	58-142			
1,1-Dichloroethene	10.4	0.20	ug/L	10.0		104	69-135			
Iodomethane	10.5	1.00	ug/L	10.0		105	56-147			
Methylene Chloride	9.34	1.00	ug/L	10.0		93.4	65-135			
Acrylonitrile	9.84	1.00	ug/L	10.0		98.4	64-134			
Carbon Disulfide	10.1	0.20	ug/L	10.0		101	78-125			
trans-1,2-Dichloroethene	10.4	0.20	ug/L	10.0		104	78-128			
Vinyl Acetate	10.4	0.20	ug/L	10.0		104	55-138			
1,1-Dichloroethane	10.5	0.20	ug/L	10.0		105	76-124			
2-Butanone	48.4	5.00	ug/L	50.0		96.9	61-140			
cis-1,2-Dichloroethene	10.5	0.20	ug/L	10.0		105	80-121			
Chloroform	10.5	0.20	ug/L	10.0		105	80-122			
Bromochloromethane	10.8	0.20	ug/L	10.0		108	80-121			
1,1,1-Trichloroethane	10.9	0.20	ug/L	10.0		109	79-123			
Carbon tetrachloride	11.0	0.20	ug/L	10.0		110	53-137			
1,2-Dichloroethane	11.0	0.20	ug/L	10.0		110	75-123			
Benzene	10.7	0.20	ug/L	10.0		107	80-120			
Trichloroethene	10.9	0.20	ug/L	10.0		109	80-120			
1,2-Dichloropropane	10.3	0.20	ug/L	10.0		103	80-120			
Bromodichloromethane	10.6	0.20	ug/L	10.0		106	80-121			
Dibromomethane	10.8	0.20	ug/L	10.0		108	80-120			
4-Methyl-2-Pentanone	47.8	5.00	ug/L	50.0		95.6	67-133			
cis-1,3-Dichloropropene	10.8	0.20	ug/L	10.0		108	80-124			
Toluene	10.3	0.20	ug/L	10.0		103	80-120			



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BNL0268 - EPA 8260D in Water

Instrument: NT3 Analyst: FCL

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BNL0268-BS1)						Prepared: 11-Dec-2025 Analyzed: 11-Dec-2025 12:06				
trans-1,3-Dichloropropene	10.1	0.20	ug/L	10.0		101	71-127			
2-Hexanone	47.5	5.00	ug/L	50.0		95.0	69-133			
1,1,2-Trichloroethane	10.6	0.20	ug/L	10.0		106	80-121			
Tetrachloroethene	10.7	0.20	ug/L	10.0		107	80-120			
Dibromochloromethane	11.0	0.20	ug/L	10.0		110	65-135			
1,2-Dibromoethane	11.0	0.20	ug/L	10.0		110	80-121			
Chlorobenzene	10.7	0.20	ug/L	10.0		107	80-120			
Ethylbenzene	10.8	0.20	ug/L	10.0		108	80-120			
1,1,1,2-Tetrachloroethane	11.2	0.20	ug/L	10.0		112	80-120			
m,p-Xylene	22.1	0.40	ug/L	20.0		111	80-121			
o-Xylene	10.9	0.20	ug/L	10.0		109	80-121			
Styrene	11.4	0.20	ug/L	10.0		114	80-124			
Bromoform	10.3	0.20	ug/L	10.0		103	51-134			
1,1,2,2-Tetrachloroethane	10.6	0.20	ug/L	10.0		106	77-123			
1,2,3-Trichloropropane	10.5	0.50	ug/L	10.0		105	76-125			
trans-1,4-Dichloro 2-Butene	10.7	1.00	ug/L	10.0		107	55-129			
1,4-Dichlorobenzene	10.7	0.20	ug/L	10.0		107	80-120			
1,2-Dichlorobenzene	10.8	0.20	ug/L	10.0		108	80-120			
1,2-Dibromo-3-chloropropane	10.3	0.50	ug/L	10.0		103	62-123			
Surrogate: 1,2-Dichloroethane-d4	6.39		ug/L	6.25		102	80-129			
Surrogate: Toluene-d8	6.20		ug/L	6.25		99.2	80-120			
Surrogate: 4-Bromofluorobenzene	6.23		ug/L	6.25		99.7	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.12		ug/L	5.00		102	80-120			
LCS Dup (BNL0268-BSD1)						Prepared: 11-Dec-2025 Analyzed: 11-Dec-2025 12:51				
Chloromethane	8.85	0.50	ug/L	10.0		88.5	60-138	3.78	30	
Vinyl Chloride	9.68	0.20	ug/L	10.0		96.8	66-133	5.34	30	
Bromomethane	9.93	1.00	ug/L	10.0		99.3	72-131	2.86	30	
Chloroethane	10.5	0.20	ug/L	10.0		105	60-155	2.22	30	
Trichlorofluoromethane	10.4	0.20	ug/L	10.0		104	62-141	1.88	30	
Acetone	44.7	5.00	ug/L	50.0		89.3	58-142	5.90	30	
1,1-Dichloroethene	10.1	0.20	ug/L	10.0		101	69-135	3.09	30	
Iodomethane	10.1	1.00	ug/L	10.0		101	56-147	3.28	30	
Methylene Chloride	9.21	1.00	ug/L	10.0		92.1	65-135	1.34	30	
Acrylonitrile	9.47	1.00	ug/L	10.0		94.7	64-134	3.89	30	
Carbon Disulfide	9.78	0.20	ug/L	10.0		97.8	78-125	3.02	30	
trans-1,2-Dichloroethene	9.97	0.20	ug/L	10.0		99.7	78-128	4.04	30	
Vinyl Acetate	10.3	0.20	ug/L	10.0		103	55-138	1.28	30	
1,1-Dichloroethane	10.2	0.20	ug/L	10.0		102	76-124	2.88	30	
2-Butanone	46.8	5.00	ug/L	50.0		93.6	61-140	3.41	30	
cis-1,2-Dichloroethene	10.3	0.20	ug/L	10.0		103	80-121	1.39	30	
Chloroform	10.2	0.20	ug/L	10.0		102	80-122	2.35	30	



Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BNL0268 - EPA 8260D in Water

Instrument: NT3 Analyst: FCL

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BNL0268-BSD1) Prepared: 11-Dec-2025 Analyzed: 11-Dec-2025 12:51										
Bromochloromethane	10.4	0.20	ug/L	10.0		104	80-121	4.25	30	
1,1,1-Trichloroethane	10.6	0.20	ug/L	10.0		106	79-123	2.76	30	
Carbon tetrachloride	11.1	0.20	ug/L	10.0		111	53-137	0.61	30	
1,2-Dichloroethane	10.7	0.20	ug/L	10.0		107	75-123	2.83	30	
Benzene	10.5	0.20	ug/L	10.0		105	80-120	2.15	30	
Trichloroethene	10.5	0.20	ug/L	10.0		105	80-120	3.46	30	
1,2-Dichloropropane	10.2	0.20	ug/L	10.0		102	80-120	0.83	30	
Bromodichloromethane	10.7	0.20	ug/L	10.0		107	80-121	0.53	30	
Dibromomethane	10.7	0.20	ug/L	10.0		107	80-120	0.60	30	
4-Methyl-2-Pentanone	47.6	5.00	ug/L	50.0		95.3	67-133	0.30	30	
cis-1,3-Dichloropropene	10.5	0.20	ug/L	10.0		105	80-124	2.72	30	
Toluene	10.2	0.20	ug/L	10.0		102	80-120	0.89	30	
trans-1,3-Dichloropropene	10.0	0.20	ug/L	10.0		100	71-127	0.94	30	
2-Hexanone	48.0	5.00	ug/L	50.0		96.0	69-133	1.09	30	
1,1,2-Trichloroethane	10.7	0.20	ug/L	10.0		107	80-121	0.55	30	
Tetrachloroethene	10.6	0.20	ug/L	10.0		106	80-120	0.38	30	
Dibromochloromethane	10.9	0.20	ug/L	10.0		109	65-135	1.58	30	
1,2-Dibromoethane	11.2	0.20	ug/L	10.0		112	80-121	1.55	30	
Chlorobenzene	10.5	0.20	ug/L	10.0		105	80-120	2.33	30	
Ethylbenzene	10.4	0.20	ug/L	10.0		104	80-120	3.60	30	
1,1,1,2-Tetrachloroethane	11.0	0.20	ug/L	10.0		110	80-120	1.61	30	
m,p-Xylene	21.5	0.40	ug/L	20.0		108	80-121	2.82	30	
o-Xylene	10.7	0.20	ug/L	10.0		107	80-121	2.08	30	
Styrene	11.2	0.20	ug/L	10.0		112	80-124	1.80	30	
Bromoform	10.1	0.20	ug/L	10.0		101	51-134	1.76	30	
1,1,2,2-Tetrachloroethane	10.5	0.20	ug/L	10.0		105	77-123	1.36	30	
1,2,3-Trichloropropane	10.2	0.50	ug/L	10.0		102	76-125	2.76	30	
trans-1,4-Dichloro 2-Butene	10.8	1.00	ug/L	10.0		108	55-129	0.89	30	
1,4-Dichlorobenzene	10.3	0.20	ug/L	10.0		103	80-120	3.72	30	
1,2-Dichlorobenzene	10.5	0.20	ug/L	10.0		105	80-120	2.97	30	
1,2-Dibromo-3-chloropropane	9.94	0.50	ug/L	10.0		99.4	62-123	3.45	30	
Surrogate: 1,2-Dichloroethane-d4	6.32		ug/L	6.25		101	80-129			
Surrogate: Toluene-d8	6.29		ug/L	6.25		101	80-120			
Surrogate: 4-Bromofluorobenzene	6.28		ug/L	6.25		100	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.05		ug/L	5.00		101	80-120			
Matrix Spike (BNL0268-MS1) Source: 25L0244-13 Prepared: 11-Dec-2025 Analyzed: 11-Dec-2025 21:35										
Chloromethane	8.11	0.50	ug/L	10.0	ND	81.1	60-138			
Vinyl Chloride	9.05	0.20	ug/L	10.0	ND	90.5	66-133			
Bromomethane	9.38	1.00	ug/L	10.0	ND	93.8	72-131			
Chloroethane	9.52	0.20	ug/L	10.0	ND	95.2	60-155			
Trichlorofluoromethane	10.5	0.20	ug/L	10.0	ND	105	62-141			



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Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BNL0268 - EPA 8260D in Water

Instrument: NT3 Analyst: FCL

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BNL0268-MS1)		Source: 25L0244-13		Prepared: 11-Dec-2025		Analyzed: 11-Dec-2025 21:35				
Acetone	47.1	5.00	ug/L	50.0	ND	94.2	58-142			
1,1-Dichloroethene	9.65	0.20	ug/L	10.0	ND	96.5	69-135			
Iodomethane	9.74	1.00	ug/L	10.0	ND	97.4	56-147			
Methylene Chloride	8.85	1.00	ug/L	10.0	ND	88.5	65-135			
Acrylonitrile	9.13	1.00	ug/L	10.0	ND	91.3	64-134			
Carbon Disulfide	9.20	0.20	ug/L	10.0	ND	92.0	78-125			
trans-1,2-Dichloroethene	9.50	0.20	ug/L	10.0	ND	95.0	78-128			
Vinyl Acetate	8.73	0.20	ug/L	10.0	ND	87.3	55-138			
1,1-Dichloroethane	10.4	0.20	ug/L	10.0	0.82	95.8	76-124			
2-Butanone	46.1	5.00	ug/L	50.0	ND	92.2	61-140			
cis-1,2-Dichloroethene	10.4	0.20	ug/L	10.0	0.75	97.0	80-121			
Chloroform	19.3	0.20	ug/L	10.0	9.37	99.7	80-122			
Bromochloromethane	10.3	0.20	ug/L	10.0	ND	103	80-121			
1,1,1-Trichloroethane	10.6	0.20	ug/L	10.0	ND	106	79-123			
Carbon tetrachloride	10.7	0.20	ug/L	10.0	ND	107	53-137			
1,2-Dichloroethane	10.9	0.20	ug/L	10.0	ND	109	75-123			
Benzene	9.90	0.20	ug/L	10.0	ND	99.0	80-120			
Trichloroethene	10.3	0.20	ug/L	10.0	ND	103	80-120			
1,2-Dichloropropane	9.29	0.20	ug/L	10.0	ND	92.9	80-120			
Bromodichloromethane	11.1	0.20	ug/L	10.0	0.66	105	80-121			
Dibromomethane	10.6	0.20	ug/L	10.0	ND	106	80-120			
4-Methyl-2-Pentanone	44.9	5.00	ug/L	50.0	ND	89.8	67-133			
cis-1,3-Dichloropropene	9.72	0.20	ug/L	10.0	ND	97.2	80-124			
Toluene	9.68	0.20	ug/L	10.0	ND	96.8	80-120			
trans-1,3-Dichloropropene	9.43	0.20	ug/L	10.0	ND	94.3	71-127			
2-Hexanone	46.0	5.00	ug/L	50.0	ND	92.1	69-133			
1,1,2-Trichloroethane	10.3	0.20	ug/L	10.0	ND	103	80-121			
Tetrachloroethene	10.3	0.20	ug/L	10.0	ND	103	80-120			
Dibromochloromethane	10.2	0.20	ug/L	10.0	ND	102	65-135			
1,2-Dibromoethane	10.6	0.20	ug/L	10.0	ND	106	80-121			
Chlorobenzene	10.1	0.20	ug/L	10.0	ND	101	80-120			
Ethylbenzene	9.87	0.20	ug/L	10.0	ND	98.7	80-120			
1,1,1,2-Tetrachloroethane	10.5	0.20	ug/L	10.0	ND	105	80-120			
m,p-Xylene	20.5	0.40	ug/L	20.0	ND	102	80-121			
o-Xylene	10.1	0.20	ug/L	10.0	ND	101	80-121			
Styrene	10.4	0.20	ug/L	10.0	ND	104	80-124			
Bromoform	9.58	0.20	ug/L	10.0	ND	95.8	51-134			
1,1,2,2-Tetrachloroethane	10.1	0.20	ug/L	10.0	ND	101	77-123			
1,2,3-Trichloropropane	10.2	0.50	ug/L	10.0	ND	102	76-125			
trans-1,4-Dichloro 2-Butene	10.2	1.00	ug/L	10.0	ND	102	55-129			
1,4-Dichlorobenzene	10.3	0.20	ug/L	10.0	ND	103	80-120			



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BNL0268 - EPA 8260D in Water

Instrument: NT3 Analyst: FCL

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BNL0268-MS1)		Source: 25L0244-13		Prepared: 11-Dec-2025		Analyzed: 11-Dec-2025 21:35				
1,2-Dichlorobenzene	10.3	0.20	ug/L	10.0	ND	103	80-120			
1,2-Dibromo-3-chloropropane	10.0	0.50	ug/L	10.0	ND	100	62-123			
Surrogate: 1,2-Dichloroethane-d4	6.55		ug/L	6.25	6.48	105	80-129			
Surrogate: Toluene-d8	6.15		ug/L	6.25	5.99	98.4	80-120			
Surrogate: 4-Bromofluorobenzene	6.26		ug/L	6.25	6.02	100	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.00		ug/L	5.00	4.96	100	80-120			

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

Matrix Spike Dup (BNL0268-MSD1)		Source: 25L0244-13		Prepared: 11-Dec-2025		Analyzed: 11-Dec-2025 21:57				
Chloromethane	7.96	0.50	ug/L	10.0	ND	79.6	60-138	1.88	30	
Vinyl Chloride	8.25	0.20	ug/L	10.0	ND	82.5	66-133	9.18	30	
Bromomethane	8.67	1.00	ug/L	10.0	ND	86.7	72-131	7.96	30	
Chloroethane	8.99	0.20	ug/L	10.0	ND	89.9	60-155	5.74	30	
Trichlorofluoromethane	9.78	0.20	ug/L	10.0	ND	97.8	62-141	7.00	30	
Acetone	46.1	5.00	ug/L	50.0	ND	92.2	58-142	2.17	30	
1,1-Dichloroethene	9.00	0.20	ug/L	10.0	ND	90.0	69-135	6.91	30	
Iodomethane	9.01	1.00	ug/L	10.0	ND	90.1	56-147	7.81	30	
Methylene Chloride	8.03	1.00	ug/L	10.0	ND	80.3	65-135	9.64	30	
Acrylonitrile	8.10	1.00	ug/L	10.0	ND	81.0	64-134	11.90	30	
Carbon Disulfide	8.49	0.20	ug/L	10.0	ND	84.9	78-125	8.01	30	
trans-1,2-Dichloroethene	8.91	0.20	ug/L	10.0	ND	89.1	78-128	6.39	30	
Vinyl Acetate	8.15	0.20	ug/L	10.0	ND	81.5	55-138	6.86	30	
1,1-Dichloroethane	9.67	0.20	ug/L	10.0	0.82	88.5	76-124	7.22	30	
2-Butanone	43.1	5.00	ug/L	50.0	ND	86.1	61-140	6.82	30	
cis-1,2-Dichloroethene	9.95	0.20	ug/L	10.0	0.75	92.1	80-121	4.86	30	
Chloroform	17.8	0.20	ug/L	10.0	9.37	84.4	80-122	8.22	30	
Bromochloromethane	9.53	0.20	ug/L	10.0	ND	95.3	80-121	7.56	30	
1,1,1-Trichloroethane	9.86	0.20	ug/L	10.0	ND	98.6	79-123	7.42	30	
Carbon tetrachloride	10.2	0.20	ug/L	10.0	ND	102	53-137	5.00	30	
1,2-Dichloroethane	10.1	0.20	ug/L	10.0	ND	101	75-123	7.33	30	
Benzene	9.16	0.20	ug/L	10.0	ND	91.6	80-120	7.76	30	
Trichloroethene	9.72	0.20	ug/L	10.0	ND	97.2	80-120	6.07	30	
1,2-Dichloropropane	8.66	0.20	ug/L	10.0	ND	86.6	80-120	7.03	30	
Bromodichloromethane	10.4	0.20	ug/L	10.0	0.66	97.5	80-121	6.55	30	
Dibromomethane	9.88	0.20	ug/L	10.0	ND	98.8	80-120	6.67	30	
4-Methyl-2-Pentanone	42.0	5.00	ug/L	50.0	ND	84.0	67-133	6.66	30	
cis-1,3-Dichloropropene	9.02	0.20	ug/L	10.0	ND	90.2	80-124	7.54	30	
Toluene	9.01	0.20	ug/L	10.0	ND	90.1	80-120	7.18	30	
trans-1,3-Dichloropropene	8.86	0.20	ug/L	10.0	ND	88.6	71-127	6.33	30	
2-Hexanone	42.7	5.00	ug/L	50.0	ND	85.4	69-133	7.52	30	
1,1,2-Trichloroethane	9.61	0.20	ug/L	10.0	ND	96.1	80-121	7.13	30	
Tetrachloroethene	9.32	0.20	ug/L	10.0	ND	93.2	80-120	9.80	30	



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Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BNL0268 - EPA 8260D in Water

Instrument: NT3 Analyst: FCL

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BNL0268-MSD1)		Source: 25L0244-13		Prepared: 11-Dec-2025 Analyzed: 11-Dec-2025 21:57						
Dibromochloromethane	9.52	0.20	ug/L	10.0	ND	95.2	65-135	7.37	30	
1,2-Dibromoethane	10.1	0.20	ug/L	10.0	ND	101	80-121	5.15	30	
Chlorobenzene	9.25	0.20	ug/L	10.0	ND	92.5	80-120	8.77	30	
Ethylbenzene	9.06	0.20	ug/L	10.0	ND	90.6	80-120	8.58	30	
1,1,1,2-Tetrachloroethane	9.68	0.20	ug/L	10.0	ND	96.8	80-120	8.54	30	
m,p-Xylene	18.5	0.40	ug/L	20.0	ND	92.7	80-121	9.87	30	
o-Xylene	9.16	0.20	ug/L	10.0	ND	91.6	80-121	9.67	30	
Styrene	9.37	0.20	ug/L	10.0	ND	93.7	80-124	10.30	30	
Bromoform	8.74	0.20	ug/L	10.0	ND	87.4	51-134	9.20	30	
1,1,2,2-Tetrachloroethane	8.85	0.20	ug/L	10.0	ND	88.5	77-123	13.60	30	
1,2,3-Trichloropropane	9.14	0.50	ug/L	10.0	ND	91.4	76-125	11.40	30	
trans-1,4-Dichloro 2-Butene	9.70	1.00	ug/L	10.0	ND	97.0	55-129	5.27	30	
1,4-Dichlorobenzene	8.94	0.20	ug/L	10.0	ND	89.4	80-120	13.90	30	
1,2-Dichlorobenzene	9.06	0.20	ug/L	10.0	ND	90.6	80-120	13.20	30	
1,2-Dibromo-3-chloropropane	9.27	0.50	ug/L	10.0	ND	92.7	62-123	7.74	30	
Surrogate: 1,2-Dichloroethane-d4	6.65		ug/L	6.25	6.48	106	80-129			
Surrogate: Toluene-d8	6.23		ug/L	6.25	5.99	99.7	80-120			
Surrogate: 4-Bromofluorobenzene	6.57		ug/L	6.25	6.02	105	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.16		ug/L	5.00	4.96	103	80-120			

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



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BNL0306 - EPA 8260D in Water

Instrument: NT3 Analyst: FCL

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0306-BLK1)				Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 14:52						
Chloromethane	ND	0.50	ug/L							U
Vinyl Chloride	ND	0.20	ug/L							U
Bromomethane	ND	1.00	ug/L							U
Chloroethane	ND	0.20	ug/L							U
Trichlorofluoromethane	ND	0.20	ug/L							U
Acetone	ND	5.00	ug/L							U
1,1-Dichloroethene	ND	0.20	ug/L							U
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.20	ug/L							U
Vinyl Acetate	ND	0.20	ug/L							U
1,1-Dichloroethane	ND	0.20	ug/L							U
2-Butanone	ND	5.00	ug/L							U
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Chloroform	ND	0.20	ug/L							U
Bromochloromethane	ND	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.20	ug/L							U
Carbon tetrachloride	ND	0.20	ug/L							U
1,2-Dichloroethane	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Trichloroethene	ND	0.20	ug/L							U
1,2-Dichloropropane	ND	0.20	ug/L							U
Bromodichloromethane	ND	0.20	ug/L							U
Dibromomethane	ND	0.20	ug/L							U
4-Methyl-2-Pentanone	ND	5.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.20	ug/L							U
Toluene	ND	0.20	ug/L							U
trans-1,3-Dichloropropene	ND	0.20	ug/L							U
2-Hexanone	ND	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.20	ug/L							U
Tetrachloroethene	ND	0.20	ug/L							U
Dibromochloromethane	ND	0.20	ug/L							U
1,2-Dibromoethane	ND	0.20	ug/L							U
Chlorobenzene	ND	0.20	ug/L							U
Ethylbenzene	ND	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.20	ug/L							U
m,p-Xylene	ND	0.40	ug/L							U
o-Xylene	ND	0.20	ug/L							U
Styrene	ND	0.20	ug/L							U



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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BNL0306 - EPA 8260D in Water

Instrument: NT3 Analyst: FCL

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0306-BLK1)										
Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 14:52										
Bromoform	ND	0.20	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.50	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	1.00	ug/L							U
1,4-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.50	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	6.29		ug/L	6.25		101	80-129			
Surrogate: Toluene-d8	6.10		ug/L	6.25		97.7	80-120			
Surrogate: 4-Bromofluorobenzene	6.20		ug/L	6.25		99.3	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.08		ug/L	5.00		102	80-120			
LCS (BNL0306-BS1)										
Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 12:59										
Chloromethane	7.80	0.50	ug/L	10.0		78.0	60-138			Q
Vinyl Chloride	8.14	0.20	ug/L	10.0		81.4	66-133			
Bromomethane	9.16	1.00	ug/L	10.0		91.6	72-131			
Chloroethane	9.17	0.20	ug/L	10.0		91.7	60-155			
Trichlorofluoromethane	10.2	0.20	ug/L	10.0		102	62-141			
Acetone	39.8	5.00	ug/L	50.0		79.6	58-142			Q
1,1-Dichloroethene	9.25	0.20	ug/L	10.0		92.5	69-135			
Iodomethane	9.62	1.00	ug/L	10.0		96.2	56-147			
Methylene Chloride	8.49	1.00	ug/L	10.0		84.9	65-135			
Acrylonitrile	8.14	1.00	ug/L	10.0		81.4	64-134			
Carbon Disulfide	9.02	0.20	ug/L	10.0		90.2	78-125			
trans-1,2-Dichloroethene	9.31	0.20	ug/L	10.0		93.1	78-128			
Vinyl Acetate	9.36	0.20	ug/L	10.0		93.6	55-138			
1,1-Dichloroethane	9.16	0.20	ug/L	10.0		91.6	76-124			
2-Butanone	41.2	5.00	ug/L	50.0		82.5	61-140			
cis-1,2-Dichloroethene	9.45	0.20	ug/L	10.0		94.5	80-121			
Chloroform	9.63	0.20	ug/L	10.0		96.3	80-122			
Bromochloromethane	9.84	0.20	ug/L	10.0		98.4	80-121			
1,1,1-Trichloroethane	10.1	0.20	ug/L	10.0		101	79-123			
Carbon tetrachloride	10.3	0.20	ug/L	10.0		103	53-137			
1,2-Dichloroethane	10.5	0.20	ug/L	10.0		105	75-123			
Benzene	9.43	0.20	ug/L	10.0		94.3	80-120			
Trichloroethene	9.92	0.20	ug/L	10.0		99.2	80-120			
1,2-Dichloropropane	9.06	0.20	ug/L	10.0		90.6	80-120			
Bromodichloromethane	10.1	0.20	ug/L	10.0		101	80-121			
Dibromomethane	10.1	0.20	ug/L	10.0		101	80-120			
4-Methyl-2-Pentanone	43.3	5.00	ug/L	50.0		86.5	67-133			
cis-1,3-Dichloropropene	9.46	0.20	ug/L	10.0		94.6	80-124			
Toluene	9.34	0.20	ug/L	10.0		93.4	80-120			



Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BNL0306 - EPA 8260D in Water

Instrument: NT3 Analyst: FCL

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BNL0306-BS1) Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 12:59										
trans-1,3-Dichloropropene	9.33	0.20	ug/L	10.0		93.3	71-127			
2-Hexanone	43.4	5.00	ug/L	50.0		86.9	69-133			
1,1,2-Trichloroethane	9.98	0.20	ug/L	10.0		99.8	80-121			
Tetrachloroethene	9.84	0.20	ug/L	10.0		98.4	80-120			
Dibromochloromethane	10.0	0.20	ug/L	10.0		100	65-135			
1,2-Dibromoethane	10.4	0.20	ug/L	10.0		104	80-121			
Chlorobenzene	9.69	0.20	ug/L	10.0		96.9	80-120			
Ethylbenzene	9.48	0.20	ug/L	10.0		94.8	80-120			
1,1,1,2-Tetrachloroethane	10.0	0.20	ug/L	10.0		100	80-120			
m,p-Xylene	19.5	0.40	ug/L	20.0		97.5	80-121			
o-Xylene	9.67	0.20	ug/L	10.0		96.7	80-121			
Styrene	9.75	0.20	ug/L	10.0		97.5	80-124			
Bromoform	9.10	0.20	ug/L	10.0		91.0	51-134			
1,1,2,2-Tetrachloroethane	9.23	0.20	ug/L	10.0		92.3	77-123			
1,2,3-Trichloropropane	9.58	0.50	ug/L	10.0		95.8	76-125			
trans-1,4-Dichloro 2-Butene	9.75	1.00	ug/L	10.0		97.5	55-129			
1,4-Dichlorobenzene	9.47	0.20	ug/L	10.0		94.7	80-120			
1,2-Dichlorobenzene	9.62	0.20	ug/L	10.0		96.2	80-120			
1,2-Dibromo-3-chloropropane	9.07	0.50	ug/L	10.0		90.7	62-123			
Surrogate: 1,2-Dichloroethane-d4	6.26		ug/L	6.25		100	80-129			
Surrogate: Toluene-d8	6.17		ug/L	6.25		98.6	80-120			
Surrogate: 4-Bromofluorobenzene	6.40		ug/L	6.25		102	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.10		ug/L	5.00		102	80-120			
LCS Dup (BNL0306-BSD1) Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 13:21										
Chloromethane	8.68	0.50	ug/L	10.0		86.8	60-138	10.70	30	Q
Vinyl Chloride	9.14	0.20	ug/L	10.0		91.4	66-133	11.60	30	
Bromomethane	9.67	1.00	ug/L	10.0		96.7	72-131	5.42	30	
Chloroethane	9.74	0.20	ug/L	10.0		97.4	60-155	6.09	30	
Trichlorofluoromethane	10.8	0.20	ug/L	10.0		108	62-141	5.07	30	
Acetone	44.6	5.00	ug/L	50.0		89.2	58-142	11.30	30	Q
1,1-Dichloroethene	9.74	0.20	ug/L	10.0		97.4	69-135	5.14	30	
Iodomethane	10.1	1.00	ug/L	10.0		101	56-147	4.98	30	
Methylene Chloride	8.81	1.00	ug/L	10.0		88.1	65-135	3.69	30	
Acrylonitrile	8.70	1.00	ug/L	10.0		87.0	64-134	6.68	30	
Carbon Disulfide	9.44	0.20	ug/L	10.0		94.4	78-125	4.55	30	
trans-1,2-Dichloroethene	9.73	0.20	ug/L	10.0		97.3	78-128	4.36	30	
Vinyl Acetate	9.58	0.20	ug/L	10.0		95.8	55-138	2.35	30	
1,1-Dichloroethane	9.67	0.20	ug/L	10.0		96.7	76-124	5.43	30	
2-Butanone	44.4	5.00	ug/L	50.0		88.8	61-140	7.42	30	
cis-1,2-Dichloroethene	10.0	0.20	ug/L	10.0		100	80-121	5.88	30	
Chloroform	10.1	0.20	ug/L	10.0		101	80-122	4.91	30	



Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BNL0306 - EPA 8260D in Water

Instrument: NT3 Analyst: FCL

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BNL0306-BSD1)		Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 13:21								
Bromochloromethane	10.3	0.20	ug/L	10.0		103	80-121	4.48	30	
1,1,1-Trichloroethane	10.6	0.20	ug/L	10.0		106	79-123	4.85	30	
Carbon tetrachloride	11.3	0.20	ug/L	10.0		113	53-137	9.16	30	
1,2-Dichloroethane	11.3	0.20	ug/L	10.0		113	75-123	7.78	30	
Benzene	10.3	0.20	ug/L	10.0		103	80-120	9.06	30	
Trichloroethene	10.7	0.20	ug/L	10.0		107	80-120	7.27	30	
1,2-Dichloropropane	9.62	0.20	ug/L	10.0		96.2	80-120	5.99	30	
Bromodichloromethane	10.8	0.20	ug/L	10.0		108	80-121	6.20	30	
Dibromomethane	11.0	0.20	ug/L	10.0		110	80-120	9.26	30	
4-Methyl-2-Pentanone	46.4	5.00	ug/L	50.0		92.8	67-133	6.98	30	
cis-1,3-Dichloropropene	10.4	0.20	ug/L	10.0		104	80-124	9.38	30	
Toluene	10.1	0.20	ug/L	10.0		101	80-120	7.85	30	
trans-1,3-Dichloropropene	10.0	0.20	ug/L	10.0		100	71-127	7.09	30	
2-Hexanone	46.2	5.00	ug/L	50.0		92.3	69-133	6.03	30	
1,1,2-Trichloroethane	10.7	0.20	ug/L	10.0		107	80-121	6.87	30	
Tetrachloroethene	10.3	0.20	ug/L	10.0		103	80-120	5.00	30	
Dibromochloromethane	10.7	0.20	ug/L	10.0		107	65-135	6.62	30	
1,2-Dibromoethane	11.1	0.20	ug/L	10.0		111	80-121	7.19	30	
Chlorobenzene	10.3	0.20	ug/L	10.0		103	80-120	6.24	30	
Ethylbenzene	10.1	0.20	ug/L	10.0		101	80-120	6.44	30	
1,1,1,2-Tetrachloroethane	10.9	0.20	ug/L	10.0		109	80-120	8.29	30	
m,p-Xylene	20.7	0.40	ug/L	20.0		104	80-121	6.15	30	
o-Xylene	10.3	0.20	ug/L	10.0		103	80-121	6.22	30	
Styrene	10.8	0.20	ug/L	10.0		108	80-124	9.82	30	
Bromoform	9.64	0.20	ug/L	10.0		96.4	51-134	5.78	30	
1,1,2,2-Tetrachloroethane	9.85	0.20	ug/L	10.0		98.5	77-123	6.48	30	
1,2,3-Trichloropropane	10.1	0.50	ug/L	10.0		101	76-125	5.04	30	
trans-1,4-Dichloro 2-Butene	10.7	1.00	ug/L	10.0		107	55-129	9.04	30	
1,4-Dichlorobenzene	10.1	0.20	ug/L	10.0		101	80-120	5.94	30	
1,2-Dichlorobenzene	10.2	0.20	ug/L	10.0		102	80-120	6.00	30	
1,2-Dibromo-3-chloropropane	10.0	0.50	ug/L	10.0		100	62-123	10.20	30	
Surrogate: 1,2-Dichloroethane-d4	6.24		ug/L	6.25		99.9	80-129			
Surrogate: Toluene-d8	6.24		ug/L	6.25		99.8	80-120			
Surrogate: 4-Bromofluorobenzene	6.43		ug/L	6.25		103	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.01		ug/L	5.00		100	80-120			



Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Dissolved Gases - Quality Control

Batch BNL0302 - EPA RSK-175 in Water

Instrument: FID6 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0302-BLK1)		Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 10:33								
Acetylene	ND	1.06	ug/L							U
Methane	ND	1.31	ug/L							U
Ethane	ND	1.12	ug/L							U
Ethene	ND	1.14	ug/L							U
Surrogate: Propane	1740		ug/L	1800		96.9	62-122			
LCS (BNL0302-BS1)		Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 10:06								
Acetylene	1100	1.06	ug/L	1060		104	80-120			
Methane	680	1.31	ug/L	656		104	80-120			
Ethane	1290	1.12	ug/L	1230		105	80-120			
Ethene	1180	1.14	ug/L	1150		103	80-120			
Surrogate: Propane	1820		ug/L	1800		101	62-122			
LCS Dup (BNL0302-BSD1)		Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 10:20								
Acetylene	1080	1.06	ug/L	1060		102	80-120	1.84	30	
Methane	671	1.31	ug/L	656		102	80-120	1.36	30	
Ethane	1290	1.12	ug/L	1230		105	80-120	0.06	30	
Ethene	1180	1.14	ug/L	1150		102	80-120	0.44	30	
Surrogate: Propane	1810		ug/L	1800		100	62-122			
Duplicate (BNL0302-DUP1)		Source: 25L0244-13		Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 15:31						
Acetylene	ND	1.06	ug/L		ND				30	U
Methane	ND	1.31	ug/L		ND				30	U
Ethane	ND	1.12	ug/L		ND				30	U
Ethene	ND	1.14	ug/L		ND				30	U
Surrogate: Propane	1850		ug/L	1800	2040	103	62-122			
Duplicate (BNL0302-DUP2)		Source: 25L0244-07		Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 15:45						
Acetylene	ND	1.06	ug/L		ND				30	U
Methane	ND	1.31	ug/L		ND				30	U
Ethane	ND	1.12	ug/L		ND				30	U
Ethene	ND	1.14	ug/L		ND				30	U
Surrogate: Propane	1920		ug/L	1800	1840	107	62-122			
Matrix Spike (BNL0302-MS1)		Source: 25L0244-13		Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 15:58						
Acetylene	1060	1.06	ug/L	1060	ND	99.8	80-120			
Methane	655	1.31	ug/L	656	ND	99.9	80-120			
Ethane	1250	1.12	ug/L	1230	ND	101	80-120			
Ethene	1140	1.14	ug/L	1150	ND	99.3	80-120			
Surrogate: Propane	1780		ug/L	1800	2040	99.1	62-122			

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

Matrix Spike Dup (BNL0302-MSD1)	Source: 25L0244-13	Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 16:11								
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Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Dissolved Gases - Quality Control

Batch BNL0302 - EPA RSK-175 in Water

Instrument: FID6 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BNL0302-MSD1)		Source: 25L0244-13		Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 16:11						
Acetylene	1130	1.06	ug/L	1060	ND	107	80-120	6.96	30	
Methane	709	1.31	ug/L	656	ND	108	80-120	7.85	30	
Ethane	1360	1.12	ug/L	1230	ND	111	80-120	8.81	30	
Ethene	1240	1.14	ug/L	1150	ND	108	80-120	8.45	30	
Surrogate: Propane	1890		ug/L	1800	2040	105	62-122			

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



Parametrix, Inc.
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Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BNL0295 - EPA 200.8 in Water

Instrument: ICPMS1 Analyst: HAL

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0295-BLK1)			Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 18:24								
Arsenic UCT	75a UCT	ND	0.000200	mg/L							U
Barium	135	ND	0.000500	mg/L							U
Cadmium UCT	111 UCT	ND	0.000100	mg/L							U
Chromium	52	ND	0.000500	mg/L							U
Copper UCT	63 UCT	ND	0.000500	mg/L							U
Lead	208	ND	0.000200	mg/L							U
Nickel UCT	60 UCT	ND	0.000500	mg/L							U
Selenium UCT	78 UCT	ND	0.00100	mg/L							U
Silver	107	ND	0.000200	mg/L							U
Zinc UCT	66 UCT	ND	0.00600	mg/L							U
Blank (BNL0295-BLK2)			Prepared: 12-Dec-2025 Analyzed: 16-Dec-2025 21:27								
Antimony	121	ND	0.000200	mg/L							U
Arsenic UCT	75a UCT	ND	0.000200	mg/L							U
Barium	135	ND	0.000500	mg/L							U
Beryllium	9	ND	0.000200	mg/L							U
Cadmium UCT	111 UCT	ND	0.000100	mg/L							U
Chromium	52	ND	0.000500	mg/L							U
Cobalt UCT	59 UCT	ND	0.000200	mg/L							U
Copper UCT	63 UCT	ND	0.000500	mg/L							U
Lead	208	ND	0.000200	mg/L							U
Nickel UCT	60 UCT	ND	0.000500	mg/L							U
Selenium UCT	78 UCT	ND	0.00100	mg/L							U
Silver	107	ND	0.000200	mg/L							U
Thallium	205	ND	0.000200	mg/L							U
Vanadium	51a	ND	0.000200	mg/L							U
Zinc UCT	66 UCT	ND	0.00600	mg/L							U
Blank (BNL0295-BLK3)			Prepared: 12-Dec-2025 Analyzed: 17-Dec-2025 22:45								
Antimony	121	ND	0.000200	mg/L							U
Arsenic UCT	75a UCT	ND	0.000200	mg/L							U
Barium	135	ND	0.000500	mg/L							U
Beryllium	9	ND	0.000200	mg/L							U
Cadmium UCT	111 UCT	ND	0.000100	mg/L							U
Chromium	52	ND	0.000500	mg/L							U
Copper UCT	63 UCT	ND	0.000500	mg/L							U
Lead	208	ND	0.000200	mg/L							U
Nickel UCT	60 UCT	ND	0.000500	mg/L							U
Selenium UCT	78 UCT	ND	0.00100	mg/L							U
Silver	107	ND	0.000200	mg/L							U
Vanadium	51a	ND	0.000200	mg/L							U
Zinc UCT	66 UCT	ND	0.00600	mg/L							U



Parametrix, Inc.
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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BNL0295 - EPA 200.8 in Water

Instrument: ICPMS1 Analyst: HAL

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BNL0295-BS1)			Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 18:34								
Arsenic UCT	75a UCT	0.0265	0.000200	mg/L	0.0250		106	85-115			
Barium	135	0.0261	0.000500	mg/L	0.0250		104	85-115			
Cadmium UCT	111 UCT	0.0263	0.000100	mg/L	0.0250		105	85-115			
Chromium	52	0.0256	0.000500	mg/L	0.0250		102	85-115			
Copper UCT	63 UCT	0.0275	0.000500	mg/L	0.0250		110	85-115			
Lead	208	0.0271	0.000200	mg/L	0.0250		108	85-115			
Nickel UCT	60 UCT	0.0272	0.000500	mg/L	0.0250		109	85-115			
Selenium UCT	78 UCT	0.0889	0.00100	mg/L	0.0800		111	85-115			
Silver	107	0.0264	0.000200	mg/L	0.0250		106	85-115			
Zinc UCT	66 UCT	0.0902	0.00600	mg/L	0.0800		113	85-115			
LCS (BNL0295-BS2)			Prepared: 12-Dec-2025 Analyzed: 16-Dec-2025 21:37								
Antimony	121	0.0237	0.000200	mg/L	0.0250		94.6	85-115			
Cobalt UCT	59 UCT	0.0252	0.000200	mg/L	0.0250		101	85-115			
Thallium	205	0.0257	0.000200	mg/L	0.0250		103	85-115			
Vanadium	51a	0.0233	0.000200	mg/L	0.0250		93.3	85-115			
LCS (BNL0295-BS3)			Prepared: 12-Dec-2025 Analyzed: 17-Dec-2025 22:55								
Beryllium	9	0.0270	0.000200	mg/L	0.0250		108	85-115			
Duplicate (BNL0295-DUP1)			Source: 25L0244-13		Prepared: 12-Dec-2025 Analyzed: 16-Dec-2025 20:36						
Antimony	121	ND	0.000400	mg/L		ND			20		U
Arsenic UCT	75a UCT	0.00738	0.000400	mg/L		0.00722			2.25	20	D
Barium	135	0.0433	0.00100	mg/L		0.0444			2.45	20	D
Cadmium UCT	111 UCT	ND	0.000200	mg/L		ND				20	U
Cobalt UCT	59 UCT	ND	0.000400	mg/L		ND				20	U, D
Copper UCT	63 UCT	0.00133	0.00100	mg/L		ND			94.00	20	L, D
Lead	208	ND	0.000400	mg/L		ND				20	U
Nickel UCT	60 UCT	0.00211	0.00100	mg/L		0.00208			1.15	20	D
Selenium UCT	78 UCT	0.00219	0.00200	mg/L		ND			11.70	20	D
Silver	107	ND	0.000400	mg/L		ND				20	U
Thallium	205	ND	0.000400	mg/L		ND				20	U
Zinc UCT	66 UCT	ND	0.0120	mg/L		ND				20	U
Duplicate (BNL0295-DUP2)			Source: 25L0244-13		Prepared: 12-Dec-2025 Analyzed: 19-Dec-2025 15:15						
Arsenic UCT	75a UCT	0.00714	0.000400	mg/L		0.00722			1.17	20	D
Lead	208	ND	0.000400	mg/L		ND				20	U
Selenium UCT	78 UCT	ND	0.00200	mg/L		ND				20	U, D
Silver	107	ND	0.000400	mg/L		ND				20	U
Thallium	205	ND	0.000400	mg/L		ND				20	U
Matrix Spike (BNL0295-MS1)			Source: 25L0244-13		Prepared: 12-Dec-2025 Analyzed: 16-Dec-2025 20:41						
Antimony	121	0.0246	0.000400	mg/L	0.0250	ND	98.4	75-125			D
Arsenic UCT	75a UCT	0.0356	0.000400	mg/L	0.0250	0.00722	114	75-125			D



Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle WA, 98104

Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BNL0295 - EPA 200.8 in Water

Instrument: ICPMS1 Analyst: HAL

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BNL0295-MS1)		Source: 25L0244-13		Prepared: 12-Dec-2025 Analyzed: 16-Dec-2025 20:41							
Barium	135	0.0700	0.00100	mg/L	0.0250	0.0444	103	75-125			D
Cadmium UCT	111 UCT	0.0285	0.000200	mg/L	0.0250	ND	114	75-125			D
Cobalt UCT	59 UCT	0.0284	0.000400	mg/L	0.0250	ND	113	75-125			D
Copper UCT	63 UCT	0.0283	0.00100	mg/L	0.0250	ND	111	75-125			D
Lead	208	0.0274	0.000400	mg/L	0.0250	ND	110	75-125			D
Nickel UCT	60 UCT	0.0293	0.00100	mg/L	0.0250	0.00208	109	75-125			D
Selenium UCT	78 UCT	0.0943	0.00200	mg/L	0.0800	ND	115	75-125			D
Silver	107	0.0273	0.000400	mg/L	0.0250	ND	109	75-125			D
Thallium	205	0.0275	0.000400	mg/L	0.0250	ND	110	75-125			D
Zinc UCT	66 UCT	0.0917	0.0120	mg/L	0.0800	ND	115	75-125			D

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

Matrix Spike Dup (BNL0295-MSD1)		Source: 25L0244-13		Prepared: 12-Dec-2025 Analyzed: 16-Dec-2025 20:46							
Antimony	121	0.0245	0.000400	mg/L	0.0250	ND	97.9	75-125	0.53	20	D
Arsenic UCT	75a UCT	0.0329	0.000400	mg/L	0.0250	0.00722	103	75-125	7.99	20	D
Barium	135	0.0692	0.00100	mg/L	0.0250	0.0444	99.3	75-125	1.21	20	D
Cadmium UCT	111 UCT	0.0259	0.000200	mg/L	0.0250	ND	103	75-125	9.83	20	D
Cobalt UCT	59 UCT	0.0257	0.000400	mg/L	0.0250	ND	102	75-125	9.98	20	D
Copper UCT	63 UCT	0.0253	0.00100	mg/L	0.0250	ND	99.1	75-125	11.40	20	D
Lead	208	0.0242	0.000400	mg/L	0.0250	ND	97.0	75-125	12.30	20	D
Nickel UCT	60 UCT	0.0264	0.00100	mg/L	0.0250	0.00208	97.4	75-125	10.30	20	D
Selenium UCT	78 UCT	0.0840	0.00200	mg/L	0.0800	ND	103	75-125	11.50	20	D
Silver	107	0.0248	0.000400	mg/L	0.0250	ND	99.0	75-125	9.75	20	D
Thallium	205	0.0249	0.000400	mg/L	0.0250	ND	99.5	75-125	9.97	20	D
Zinc UCT	66 UCT	0.0819	0.0120	mg/L	0.0800	ND	102	75-125	11.20	20	D

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

Matrix Spike Dup (BNL0295-MSD2)		Source: 25L0244-13		Prepared: 12-Dec-2025 Analyzed: 19-Dec-2025 15:25							
Arsenic UCT	75a UCT	0.0321	0.000400	mg/L	0.0250	0.00722	99.6	75-125	8.30	20	D
Lead	208	0.0250	0.000400	mg/L	0.0250	ND	100	75-125	11.50	20	D
Selenium UCT	78 UCT	0.0784	0.00200	mg/L	0.0800	ND	95.6	75-125	12.60	20	D
Silver	107	0.0231	0.000400	mg/L	0.0250	ND	92.4	75-125	11.80	20	D
Thallium	205	0.0246	0.000400	mg/L	0.0250	ND	98.4	75-125	11.30	20	D

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



Parametrix, Inc.
719 2nd Avenue, Suite 200
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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BNL0385 - EPA 6010D in Water

Instrument: ICP3 Analyst: SH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0385-BLK1)		Prepared: 17-Dec-2025 Analyzed: 23-Dec-2025 21:56								
Calcium, Dissolved	ND	0.0500	mg/L							U
Iron, Dissolved	ND	0.100	mg/L							U
Magnesium, Dissolved	ND	0.0500	mg/L							U
Manganese, Dissolved	ND	0.0040	mg/L							U
Potassium, Dissolved	ND	0.500	mg/L							U
Sodium, Dissolved	ND	0.500	mg/L							U
LCS (BNL0385-BS1)		Prepared: 17-Dec-2025 Analyzed: 23-Dec-2025 22:02								
Calcium, Dissolved	9.75	0.0505	mg/L	10.0		97.5	80-120			
Iron, Dissolved	1.90	0.101	mg/L	2.00		94.9	80-120			
Magnesium, Dissolved	9.76	0.0505	mg/L	10.0		97.6	80-120			
Manganese, Dissolved	0.487	0.0040	mg/L	0.500		97.3	80-120			
Potassium, Dissolved	9.74	0.505	mg/L	10.0		97.4	80-120			
Sodium, Dissolved	9.95	0.505	mg/L	10.0		99.5	80-120			



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Project: City of Richland Horn Rapids Landfill
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Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BNL0276 - EPA 350.1 M in Water

Instrument: LACHAT1 Analyst: LERB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0276-BLK1)					Prepared: 11-Dec-2025 Analyzed: 13-Dec-2025 13:27					
# Ammonia-N	ND	0.040	0.040	mg/L						U
LCS (BNL0276-BS2)					Prepared: 11-Dec-2025 Analyzed: 13-Dec-2025 13:38					
# Ammonia-N	0.481	0.040	0.040	mg/L	0.500		96.2 90-110			
# Indicates that ARL is NOT ACCREDITED for this parameter in this analysis and matrix.										



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Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BNL0303 - SM 2540 C-11 in Water

Instrument: BAL2 Analyst: RAL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0303-BLK1)					Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 11:06					
Dissolved Solids	ND	5	5	mg/L						U
LCS (BNL0303-BS1)					Prepared: 12-Dec-2025 Analyzed: 12-Dec-2025 11:06					
Dissolved Solids	468	10	10	mg/L	500	93.5	90-110			



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Reported:
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Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BNL0315 - SM 2320 B-11 in Water

Instrument: Accumet AB150 Analyst: LERB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0315-BLK1)					Prepared: 13-Dec-2025 Analyzed: 16-Dec-2025 13:47					
Alkalinity, Bicarbonate	ND	1.00	1.00	mg/L CaCO3						U
Alkalinity, Total	ND	1.00	1.00	mg/L CaCO3						U
Reference (BNL0315-SRM1)					Prepared: 13-Dec-2025 Analyzed: 16-Dec-2025 13:47					
Alkalinity, Total	100	1.00	1.00	mg/L CaCO3	99.8		101 34.97-115.25			



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Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BNL0316 - SM 2320 B-11 in Water

Instrument: Accumet AB150 Analyst: LERB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0316-BLK1)					Prepared: 13-Dec-2025 Analyzed: 16-Dec-2025 13:47						
Alkalinity, Bicarbonate	ND	1.00	1.00	mg/L CaCO3							U
Alkalinity, Total	ND	1.00	1.00	mg/L CaCO3							U
Duplicate (BNL0316-DUP1)					Source: 25L0244-13 Prepared: 13-Dec-2025 Analyzed: 16-Dec-2025 13:47						
Alkalinity, Bicarbonate	176	1.00	1.00	mg/L CaCO3		174			0.87	20	
Alkalinity, Total	176	1.00	1.00	mg/L CaCO3		174			0.87	20	
Reference (BNL0316-SRM1)					Prepared: 13-Dec-2025 Analyzed: 16-Dec-2025 13:47						
Alkalinity, Total	98.3	1.00	1.00	mg/L CaCO3	99.8		98.5	34.97-115.25			



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Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BNL0330 - SM 2540 D-11 in Water

Instrument: BAL2 Analyst: RAL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0330-BLK1)					Prepared: 15-Dec-2025 Analyzed: 15-Dec-2025 10:24					
Suspended Solids	ND	1	1	mg/L						U
LCS (BNL0330-BS1)					Prepared: 15-Dec-2025 Analyzed: 15-Dec-2025 10:24					
Suspended Solids	48	1	1	mg/L	50.00		95.6 90-110			
Duplicate (BNL0330-DUP1)					Source: 25L0244-13 Prepared: 15-Dec-2025 Analyzed: 15-Dec-2025 10:24					
Suspended Solids	ND	2	2	mg/L		ND		20		U



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Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BNL0363 - EPA 350.1 M in Water

Instrument: LACHAT1 Analyst: GJD

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0363-BLK1)					Prepared: 16-Dec-2025 Analyzed: 17-Dec-2025 15:07						
# Ammonia-N	ND	0.040	0.040	mg/L							U
LCS (BNL0363-BS1)					Prepared: 16-Dec-2025 Analyzed: 17-Dec-2025 15:09						
# Ammonia-N	0.494	0.040	0.040	mg/L	0.500		98.8	90-110			
Duplicate (BNL0363-DUP1)					Prepared: 16-Dec-2025 Analyzed: 17-Dec-2025 15:11						
# Ammonia-N	ND	0.040	0.040	mg/L		ND			20		U
Matrix Spike (BNL0363-MS1)					Prepared: 16-Dec-2025 Analyzed: 17-Dec-2025 15:46						
# Ammonia-N	0.043	0.040	0.040	mg/L	0.0500	ND	86.0	75-125			

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

Indicates that ARL is NOT ACCREDITED for this parameter in this analysis and matrix.



Parametrix, Inc.
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Project: City of Richland Horn Rapids Landfill
Project Number: 555-3820-004
Project Manager: Lisa Gilbert

Reported:
07-Jan-2026 15:59

Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BNL0646 - SM 5310 B-11 in Water

Instrument: TOC-LCSH Analyst: RMS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BNL0646-BLK1)					Prepared: 31-Dec-2025 Analyzed: 02-Jan-2026 07:03						
Total Organic Carbon	ND	0.50	0.50	mg/L							U
LCS (BNL0646-BS1)					Prepared: 31-Dec-2025 Analyzed: 02-Jan-2026 07:20						
Total Organic Carbon	20.11	0.50	0.50	mg/L	20.00		101	90-110			
Duplicate (BNL0646-DUP1)					Source: 25L0244-13 Prepared: 31-Dec-2025 Analyzed: 02-Jan-2026 13:04						
Total Organic Carbon	9.29	0.50	0.50	mg/L		10.09			8.28	20	
Matrix Spike (BNL0646-MS1)					Source: 25L0244-13 Prepared: 31-Dec-2025 Analyzed: 02-Jan-2026 13:25						
Total Organic Carbon	26.48	0.50	0.50	mg/L	20.00	10.09	82.0	75-125			

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



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Project: City of Richland Horn Rapids Landfill
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Reported:
07-Jan-2026 15:59

Uncertified Analytes included in this Report

Analysis Matrix & Analyte

EPA 350.1 M in Water

Ammonia-N

Indicates that ARL is NOT ACCREDITED for this parameter in this matrix.



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Project: City of Richland Horn Rapids Landfill
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Reported:
07-Jan-2026 15:59

Certified Analyses included in this Report

Analysis Matrix & Analyte

Certification Codes

EPA 200.8 in Water

Antimony-121	DoD-ELAP,NELAP,WADOE
Arsenic-75a UCT	DoD-ELAP,NELAP,WADOE
Barium-135	DoD-ELAP,NELAP,WADOE
Beryllium-9	DoD-ELAP,NELAP,WADOE
Cadmium-111 UCT	DoD-ELAP,NELAP,WADOE
Chromium-52	DoD-ELAP,NELAP,WADOE
Cobalt-59 UCT	DoD-ELAP,NELAP,WADOE
Copper-63 UCT	DoD-ELAP,NELAP,WADOE
Lead-208	DoD-ELAP,NELAP,WADOE
Nickel-60 UCT	DoD-ELAP,NELAP,WADOE
Selenium-78 UCT	DoD-ELAP,NELAP,WADOE
Silver-107	DoD-ELAP,NELAP,WADOE
Thallium-205	DoD-ELAP,NELAP,WADOE
Vanadium-51a	DoD-ELAP,NELAP,WADOE
Zinc-66 UCT	DoD-ELAP,NELAP,WADOE

EPA 6010D in Water

Calcium	DoD-ELAP,NELAP,WADOE
Iron	DoD-ELAP,NELAP,WADOE
Magnesium	DoD-ELAP,NELAP,WADOE
Manganese	DoD-ELAP,NELAP,WADOE
Potassium	DoD-ELAP,NELAP,WADOE
Sodium	DoD-ELAP,NELAP,WADOE

EPA 8260D in Water

Chloromethane	ADEC,NELAP,WADOE,DoD-ELAP
Vinyl Chloride	ADEC,NELAP,WADOE,DoD-ELAP
Bromomethane	ADEC,NELAP,WADOE,DoD-ELAP
Chloroethane	ADEC,NELAP,WADOE,DoD-ELAP
Trichlorofluoromethane	ADEC,NELAP,WADOE,DoD-ELAP
Acetone	ADEC,NELAP,WADOE,DoD-ELAP
1,1-Dichloroethene	ADEC,NELAP,WADOE,DoD-ELAP
Iodomethane	NELAP,WADOE,DoD-ELAP
Methylene Chloride	ADEC,NELAP,WADOE,DoD-ELAP
Acrylonitrile	NELAP,WADOE,DoD-ELAP
Carbon Disulfide	NELAP,WADOE,DoD-ELAP
trans-1,2-Dichloroethene	ADEC,NELAP,WADOE,DoD-ELAP
Vinyl Acetate	NELAP,WADOE,DoD-ELAP
1,1-Dichloroethane	ADEC,NELAP,WADOE,DoD-ELAP



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2-Butanone	NELAP,WADOE,DoD-ELAP
cis-1,2-Dichloroethene	ADEC,NELAP,WADOE,DoD-ELAP
Chloroform	ADEC,NELAP,WADOE,DoD-ELAP
Bromochloromethane	ADEC,NELAP,WADOE,DoD-ELAP
1,1,1-Trichloroethane	ADEC,NELAP,WADOE,DoD-ELAP
Carbon tetrachloride	ADEC,NELAP,WADOE,DoD-ELAP
1,2-Dichloroethane	ADEC,NELAP,WADOE,DoD-ELAP
Benzene	ADEC,NELAP,WADOE,DoD-ELAP
Trichloroethene	ADEC,NELAP,WADOE,DoD-ELAP
1,2-Dichloropropane	ADEC,NELAP,WADOE,DoD-ELAP
Bromodichloromethane	ADEC,NELAP,WADOE,DoD-ELAP
Dibromomethane	ADEC,NELAP,WADOE,DoD-ELAP
4-Methyl-2-Pentanone	NELAP,WADOE,DoD-ELAP
cis-1,3-Dichloropropene	ADEC,NELAP,WADOE,DoD-ELAP
Toluene	ADEC,NELAP,WADOE,DoD-ELAP
trans-1,3-Dichloropropene	ADEC,NELAP,WADOE,DoD-ELAP
2-Hexanone	NELAP,WADOE,DoD-ELAP
1,1,2-Trichloroethane	ADEC,NELAP,WADOE,DoD-ELAP
Tetrachloroethene	ADEC,NELAP,WADOE,DoD-ELAP
Dibromochloromethane	ADEC,NELAP,WADOE,DoD-ELAP
1,2-Dibromoethane	NELAP,WADOE,DoD-ELAP
Chlorobenzene	ADEC,NELAP,WADOE,DoD-ELAP
Ethylbenzene	ADEC,NELAP,WADOE,DoD-ELAP
1,1,1,2-Tetrachloroethane	ADEC,NELAP,WADOE,DoD-ELAP
m,p-Xylene	ADEC,NELAP,WADOE,DoD-ELAP
o-Xylene	ADEC,NELAP,WADOE,DoD-ELAP
Styrene	NELAP,WADOE,DoD-ELAP
Bromoform	NELAP,WADOE,DoD-ELAP
1,1,2,2-Tetrachloroethane	ADEC,NELAP,WADOE,DoD-ELAP
1,2,3-Trichloropropane	ADEC,NELAP,WADOE,DoD-ELAP
trans-1,4-Dichloro 2-Butene	ADEC,NELAP,WADOE,DoD-ELAP
1,4-Dichlorobenzene	ADEC,NELAP,WADOE,DoD-ELAP
1,2-Dichlorobenzene	ADEC,NELAP,WADOE,DoD-ELAP
1,2-Dibromo-3-chloropropane	ADEC,NELAP,WADOE,DoD-ELAP

EPA RSK-175 in Water

Acetylene	NELAP,WADOE
Methane	NELAP,WADOE
Ethane	NELAP,WADOE
Ethene	NELAP,WADOE

SM 2320 B-11 in Water



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Alkalinity, Bicarbonate	NELAP,WADOE,DoD-ELAP
Alkalinity, Total	DoD-ELAP,WADOE,NELAP
SM 2540 C-11 in Water	
Dissolved Solids	DoD-ELAP,WADOE,NELAP,WA-DW
SM 2540 D-11 in Water	
Suspended Solids	DoD-ELAP,WADOE,NELAP
SM 5310 B-11 in Water	
Total Organic Carbon	WADOE,NELAP

Certifications

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	02/28/2026
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	01/31/2026
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-018	05/12/2026
WADOE	WA Dept of Ecology	C558	06/30/2026
WA-DW	Ecology - Drinking Water	C558	06/30/2026



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Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is ≤ 5 times the reporting limit and the replicate control limit defaults to $\pm$ RL instead of 20% RPD
M	Estimated value for a GC/MS analyte detected and confirmed by an analyst but with low spectral match parameters.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ drift or minimum RRF)
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.
!	Indicates that ARL is NOT ACCREDITED for this parameter in samples logged as 'Drinking Water'
#	Indicates that ARL is NOT ACCREDITED for this parameter in this analysis and matrix.



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Phone: 509-377-8058 Fax: 509-377-8464 Envirolab@energy-northwest.com

ANALYTICAL RESULTS REPORT

Order Number: 251597

Date Reported: 15-Dec-2025

Send Report To: Parametrix
Lisa Gilbert
719 2nd Avenue, Suite 200
Seattle, WA 98104

Sample Number: 251597-01

Date Collected: 08-Dec-2025 03:40PM

Sample Location:

Date Received: 09-Dec-2025

Customer Sample ID: MW-1

Sample Number: 251597-01

ANALYTE	RESULT	UNITS	PQL	Analyzed	Method	Analyst	Qualifier
Nitrate	6.28	mg/L	0.5	12/09/2025	EPA 300.0	JHill	



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ANALYTICAL RESULTS REPORT

Sample Number: 251597-02 Date Collected: 08-Dec-2025 01:20PM
Sample Location:
Date Received: 09-Dec-2025
Customer Sample ID: MW-5

Sample Number: 251597-02

ANALYTE	RESULT	UNITS	PQL	Analyzed	Method	Analyst	Qualifier
Nitrate	1.53	mg/L	0.5	12/09/2025	EPA 300.0	JHill	



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ANALYTICAL RESULTS REPORT

Sample Number: 251597-03 Date Collected: 08-Dec-2025 02:35PM
Sample Location:
Date Received: 09-Dec-2025
Customer Sample ID: MW-6

Sample Number: 251597-03

ANALYTE	RESULT	UNITS	PQL	Analyzed	Method	Analyst	Qualifier
Nitrate	80.4	mg/L	5	12/09/2025	EPA 300.0	JHill	



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ANALYTICAL RESULTS REPORT

Sample Number: 251597-04 Date Collected: 08-Dec-2025 12:00PM
Sample Location:
Date Received: 09-Dec-2025
Customer Sample ID: MW-10

Sample Number: 251597-04

ANALYTE	RESULT	UNITS	PQL	Analyzed	Method	Analyst	Qualifier
Nitrate	37.7	mg/L	2.5	12/09/2025	EPA 300.0	JHill	

ANALYTICAL RESULTS REPORT

Sample Number: 251597-05 Date Collected: 08-Dec-2025 11:00AM
 Sample Location:
 Date Received: 09-Dec-2025
 Customer Sample ID: MW-21

Sample Number: 251597-05

ANALYTE	RESULT	UNITS	PQL	Analyzed	Method	Analyst	Qualifier
Nitrate	1.38	mg/L	0.5	12/09/2025	EPA 300.0	JHill	

Notes:

PQL: Practical Quantitation Limit

NA (Not Analyzed) Indicates this compound was not included in the current analysis.

ND (Not Detected) Indicates this compound was analyzed and not detected at a level greater than or equal to the PQL.

Qualifier Definitions

B = Analyte detected in the matrix blank

D = Analyte analyzed in a dilution

H = Sample analyzed outside hold time

L = Conditions at receipt out of compliance for method

R = RPD/RSD outside accepted recovery limits

S = Spike recovery outside accepted recovery limits

***** = Not a state-accredited analyte

E = Estimate, See Comments for details

Comments:



Authorized Signature:



Traci Williams
 Environmental Services Manager



Environmental Services

350 Hills Street Suite 107, Richland, WA 99354
Phone: 509-377-8058 **Fax:** 509-377-8464

26334 R2



350 Hills St, Suite 107, Richland, WA 99354 Website: enprecisionlabs.com
Phone: 509-377-8058 Fax: 509-377-8464 Envirolab@energy-northwest.com

ANALYTICAL RESULTS REPORT

Order Number: 251602

Date Reported: 17-Dec-2025

Send Report To: Parametrix
Lisa Gilbert
719 2nd Avenue, Suite 200
Seattle, WA 98104

Sample Number: 251602-01

Date Collected: 09-Dec-2025 03:00PM

Sample Location:

Date Received: 10-Dec-2025

Customer Sample ID: MW-2

Sample Number: 251602-01

ANALYTE	RESULT	UNITS	PQL	Analyzed	Method	Analyst	Qualifier
Nitrate	14	mg/L	0.5	12/10/2025	EPA 300.0	JHill	



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Phone: 509-377-8058 Fax: 509-377-8464 Envirolab@energy-northwest.com

ANALYTICAL RESULTS REPORT

Sample Number: 251602-02 Date Collected: 09-Dec-2025 02:00PM
Sample Location:
Date Received: 10-Dec-2025
Customer Sample ID: MW-3

Sample Number: 251602-02

ANALYTE	RESULT	UNITS	PQL	Analyzed	Method	Analyst	Qualifier
Nitrate	1.97	mg/L	0.5	12/10/2025	EPA 300.0	JHill	



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ANALYTICAL RESULTS REPORT

Sample Number: 251602-03 Date Collected: 09-Dec-2025 01:20PM
Sample Location:
Date Received: 10-Dec-2025
Customer Sample ID: MW-4

Sample Number: 251602-03

ANALYTE	RESULT	UNITS	PQL	Analyzed	Method	Analyst	Qualifier
Nitrate	11.4	mg/L	0.5	12/10/2025	EPA 300.0	JHill	



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ANALYTICAL RESULTS REPORT

Sample Number: 251602-04 Date Collected: 09-Dec-2025 12:30PM
Sample Location:
Date Received: 10-Dec-2025
Customer Sample ID: MW-8

Sample Number: 251602-04

ANALYTE	RESULT	UNITS	PQL	Analyzed	Method	Analyst	Qualifier
Nitrate	12.1	mg/L	0.5	12/10/2025	EPA 300.0	JHill	



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Phone: 509-377-8058 Fax: 509-377-8464 Envirolab@energy-northwest.com

ANALYTICAL RESULTS REPORT

Sample Number: 251602-05 Date Collected: 09-Dec-2025 11:25AM
Sample Location:
Date Received: 10-Dec-2025
Customer Sample ID: MW-9

Sample Number: 251602-05

ANALYTE	RESULT	UNITS	PQL	Analyzed	Method	Analyst	Qualifier
Nitrate	9.1	mg/L	0.5	12/10/2025	EPA 300.0	JHill	



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Phone: 509-377-8058 Fax: 509-377-8464 Envirolab@energy-northwest.com

ANALYTICAL RESULTS REPORT

Sample Number: 251602-06 Date Collected: 09-Dec-2025 03:50PM
Sample Location:
Date Received: 10-Dec-2025
Customer Sample ID: MW-11

Sample Number: 251602-06

ANALYTE	RESULT	UNITS	PQL	Analyzed	Method	Analyst	Qualifier
Nitrate	54	mg/L	2.5	12/10/2025	EPA 300.0	JHill	

ANALYTICAL RESULTS REPORT

Sample Number: 251602-07

Date Collected: 09-Dec-2025 10:30AM

Sample Location:

Date Received: 10-Dec-2025

Customer Sample ID: MW-12

Sample Number: 251602-07

ANALYTE	RESULT	UNITS	PQL	Analyzed	Method	Analyst	Qualifier
Nitrate	7.04	mg/L	0.5	12/10/2025	EPA 300.0	JHill	

Notes:

PQL: Practical Quantitation Limit

NA (Not Analyzed) Indicates this compound was not included in the current analysis.

ND (Not Detected) Indicates this compound was analyzed and not detected at a level greater than or equal to the PQL.

Qualifier Definitions

B = Analyte detected in the matrix blank

D = Analyte analyzed in a dilution

H = Sample analyzed outside hold time

L = Conditions at receipt out of compliance for method

R = RPD/RSD outside accepted recovery limits

S = Spike recovery outside accepted recovery limits

***** = Not a state-accredited analyte

E = Estimate, See Comments for details

Comments:



Authorized Signature:



Traci Williams
Environmental Services Manager



Chain of Custody Services Sales Order

Environmental Services
350 Hills Street Suite 107, Richland, WA 9935
Phone: 509-377-8058 **Fax:** 509-377-8464

Account Information						Project ID		Order ID		Requested Tests								Matrix		
Company Name: Parametrix						555-3820-004 (15.02)		251602										S - Soil WW - Waste Water DW - Drinking Water O - Oil N - NPDES Ot - Other		
Customer Contact: Lisa Gilbert																				
Mailing Address: 719 2nd Avenue, Suite 200, Seattle, WA 98104																		Rush TAT		
Billing Address (if different): City of Richland, Accounts Payable, PO Box 190, MS11, Richland, WA 99352																				
Email: lgilbert@parametrix.com						Phone: (206) 394-3667												# of working days: _____ Date Requested: _____		
Receive Invoice:		☐ Hard Copy ☐ Email		Receive Report:		☐ Hard Copy ☐ Email														
Lab Use Only	Sample Identification (Location, Name, Code, etc)			Collection Date	Collection Time	Matrix	Number of Bottles			Nitrate (EPA 300.0)									Comments	
01 MW-2				12/9	1500	WW	1	X												
02 MW-3				✓	1400		1	X												
03 MW-4				✓	1320		1	X												
04 MW-5				✓	1230		1	X												
05 MW-9				✓	1125		1	X												
06 MW-11				✓	1550		1	X												
07 MW-12				✓	1030	↓	1	X												
Being duly authorized and empowered by Customer, by signing below, Customer agrees to having reviewed, understood, and is fully accepting of the terms on the reverse side of this form.															Print / Signature		Date / Time	Received by:	Print / Signature	Date / Time
Relinquished by: Sally Nguyen																	12/9/25 @ 1700	Received by:		
Relinquished by:																		Received by:		
Accepted by lab:																				
Payment Type (circle) ☐ Paid ☒ Check															Amount \$		Please make all checks payable to Energy Northwest			
12/9/25 0639																				

Project: Horn Rapids Landfill Fourth Quarter 2025: 555-3820-004

Date Completed: 1/13/2026

QA/QC Completed By: Lisa Gilbert

Sample Dates: 12/8 and 12/9, 2025
ARI 25L0244: MW-1 through MW-6, MW-8 through MW-12, MW-21, and TB
ENW 251597 (Nitrate): MW-1, -5, -6, -10, -21
ENW 251602 (Nitrate): MW-2, -3, -4, -8, -9, -11, -12
MS/MSD and duplicate collected at MW-5

Chain vs Data: All compounds analyzed.
Chloride and sulfate subcontracted to AMTest Laboratories

Blanks: (List any compounds detected)
MB
None.
Trip
None.

Field Observations: **Water Levels**
The initial water level measurement at MW-3 was atypically high and could not be confirmed during purging. The measurement was rejected and not used for calculating potentiometric contours.
Conductivity
An atypically low concentration was observed in well MW-10 and will be rejected and flagged "R".

Lab Comments: **Sample Receipt**
Sample(s) were received 10-Dec-2025 13:40 under ARI work order 25L0244. Cooler temperatures were recorded at 0.2, 1.3, and 0.4C.
VOCs (8260D)
The sample(s) were analyzed within the recommended holding times.
Initial and continuing calibrations were within method requirements with the following exceptions. Chloromethane and acetone recovered low in SNL0195-ICV1 and were flagged with a "Q" qualifier; neither were detected in the samples, and therefore the data for all samples will be flagged "UJ."
Internal standard areas were within limits.
The surrogate percent recoveries were within control limits.
The method blank(s) were clean at the reporting limits.
The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent differences (RPDs) were within control limits.
The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and RPDs were within advisory control limits.
Dissolved Gases (RSK-175)
The sample(s) were analyzed within the recommended holding times.
Initial and continuing calibrations were within method requirements.
The surrogate percent recoveries were within control limits.
The method blank(s) were clean at the reporting limits.
The BS/LCS and BSD/LCSD spike recoveries and RPDs were within control limits.
The MS/MSD recoveries and DUP RPDs were within advisory control limits.
Dissolved Metals (6010D)
The sample(s) were digested and analyzed within the recommended holding times.
Initial and continuing calibrations including interference checks were within method requirements.
The method blank(s) were clean at the reporting limits.
The BS/LCS percent recoveries were within control limits.
Total Metals (200.8)
The sample(s) were digested and analyzed within the recommended holding times.
Initial and continuing calibrations including interference checks were within method requirements.
The method blank(s) were clean at the reporting limits.
The BS/LCS percent recoveries were within control limits.
The MS/MSD percent recoveries and the duplicate (DUP) RPDs were within advisory control limits.
Wet Chemistry
Note: Sulfate and chloride were subcontracted to AmTest
The sample(s) were prepared and analyzed within the recommended holding times.
Initial and continuing calibrations were within method requirements.
The method blank(s) were clean at the reporting limits.
The BS/LCS percent recoveries were within control limits.
The reference material (SRM) percent recoveries were within control limits.
The MS percent recoveries and the DUP RPDs were within advisory control limits.
Some analytes qualified "D" are for dilution.
Parametrix Qualifiers
Quality conductivity in MW-10 "R" as rejected due to atypically low concentration.
Qualify vinyl chloride result in MW-5 and MW-21 "J" due to variability between sample and field duplicate.
Qualify acetone and chloromethane results "UJ" for all samples due to initial or continuing calibration outside acceptance criteria low.

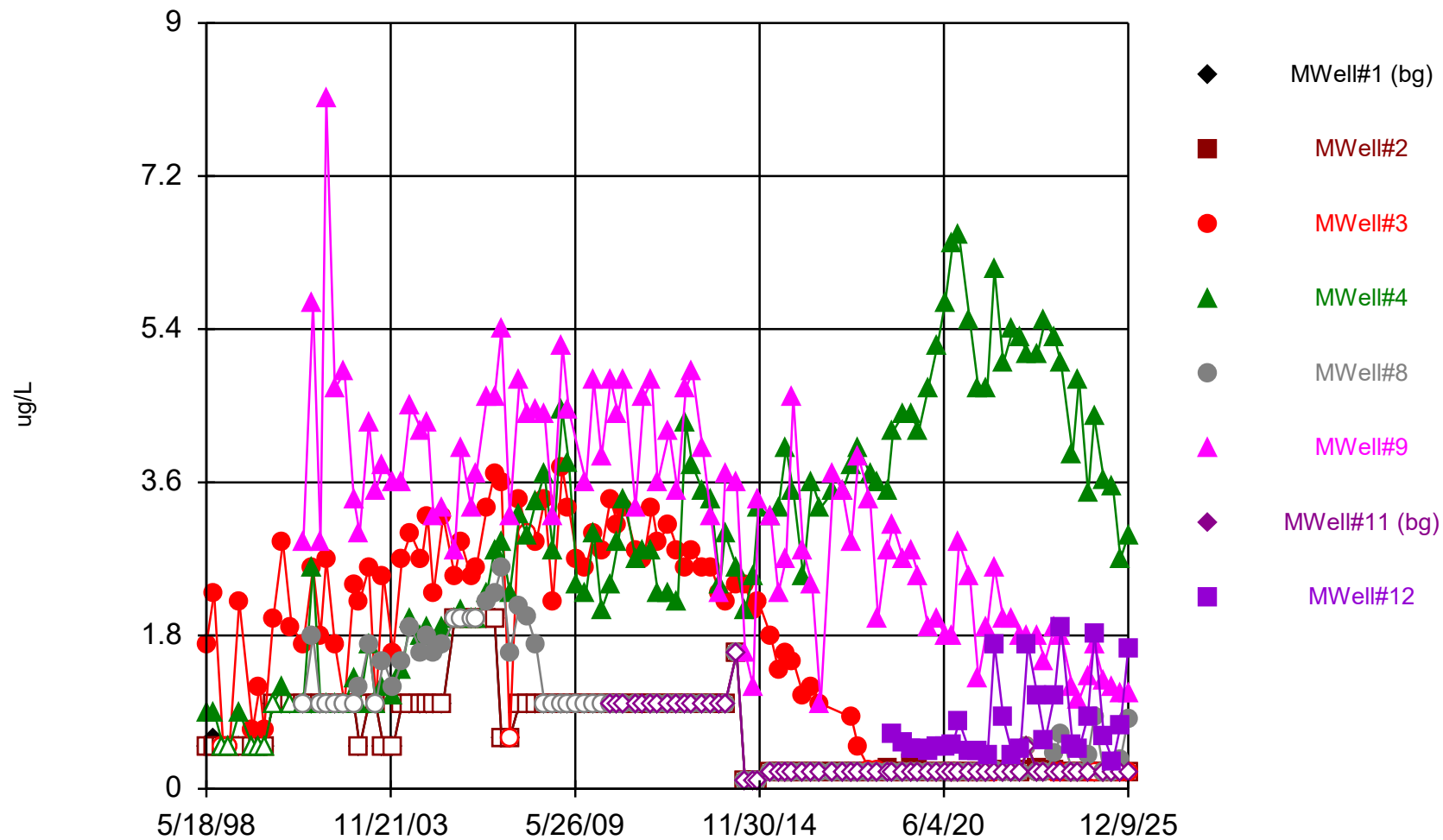
Appendix C

Time-Series Plots

C-1

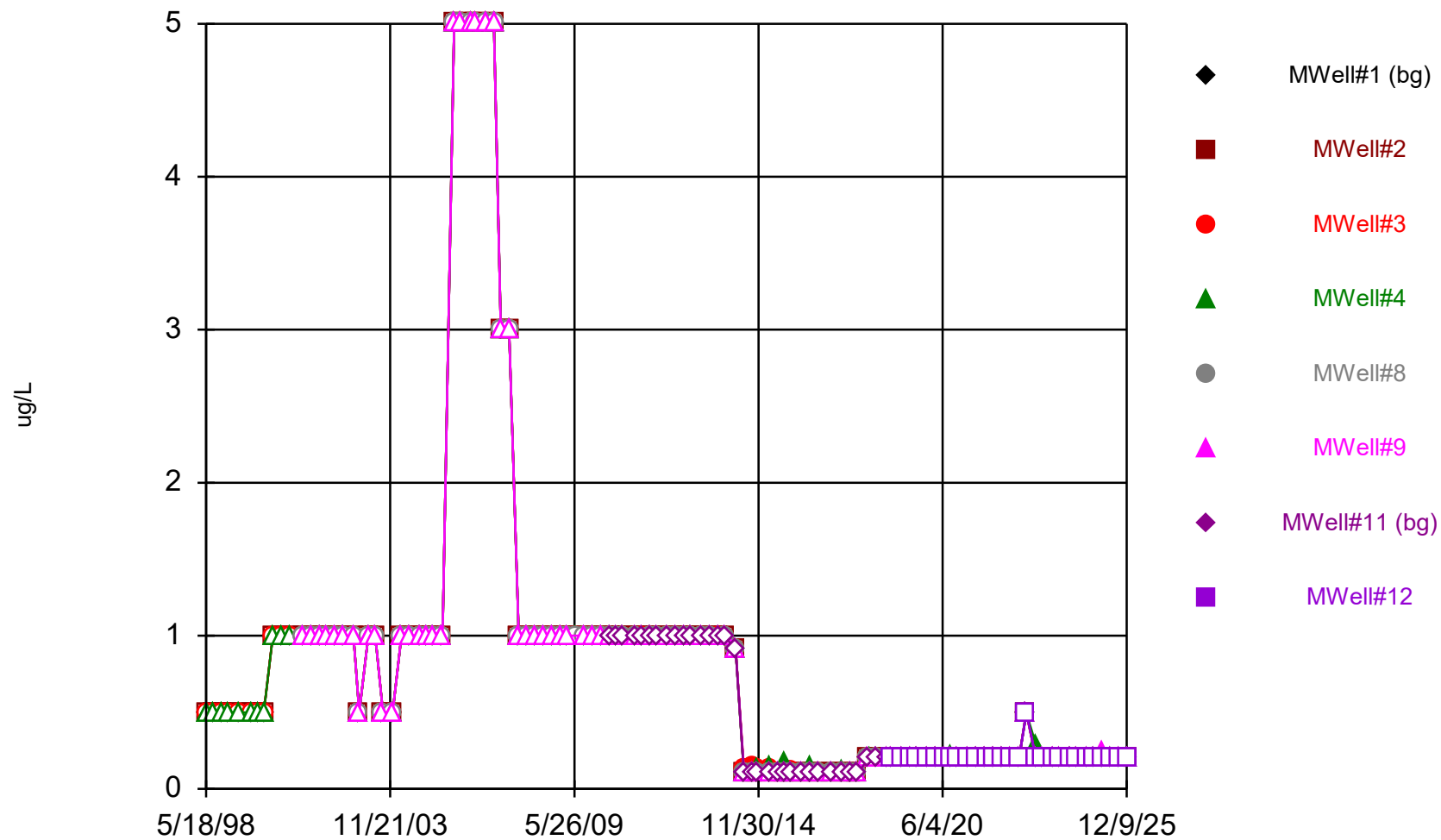
Groundwater and
Leachate Ports

Time Series



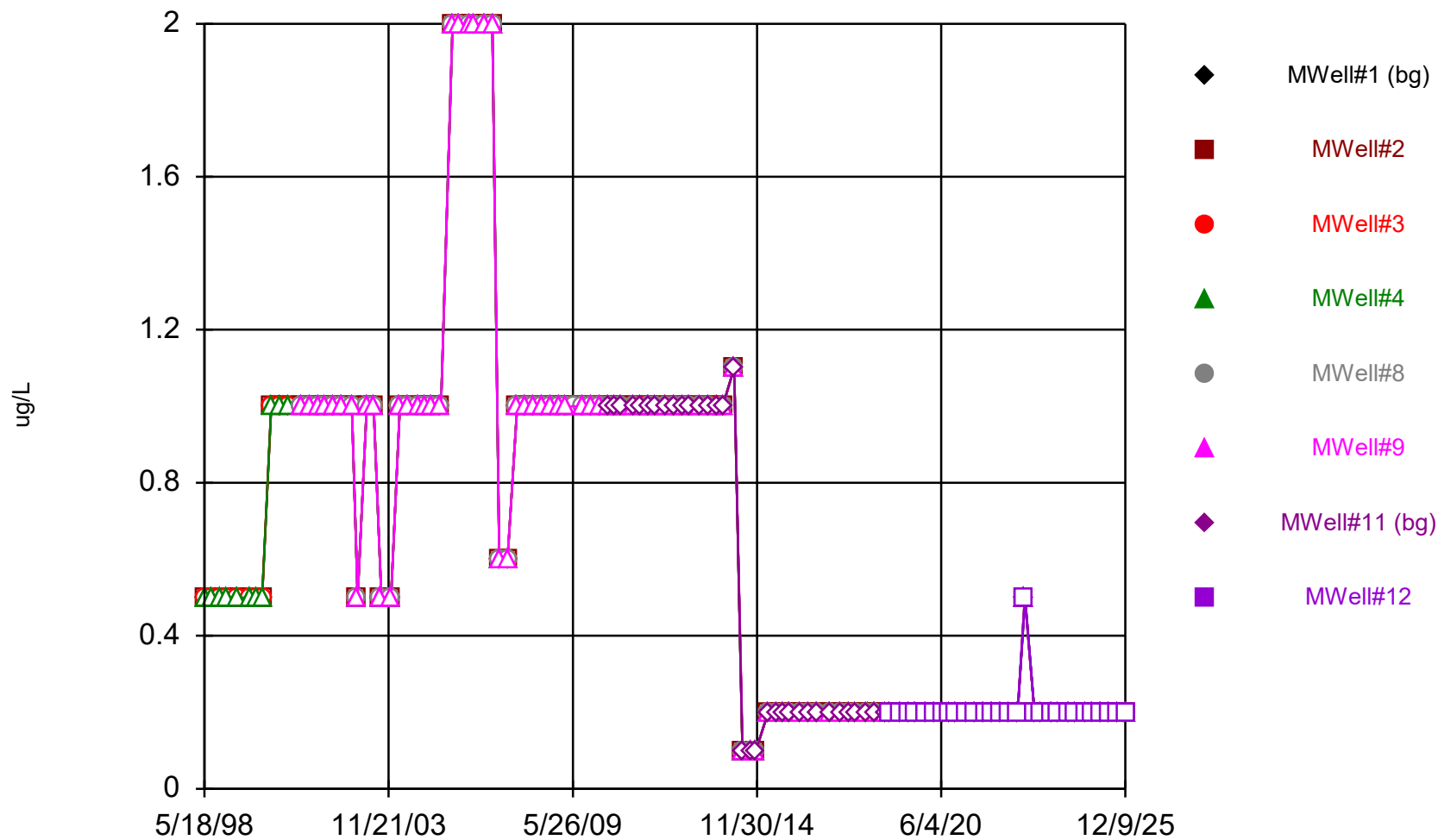
Constituent: 1,1-Dichloroethane Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



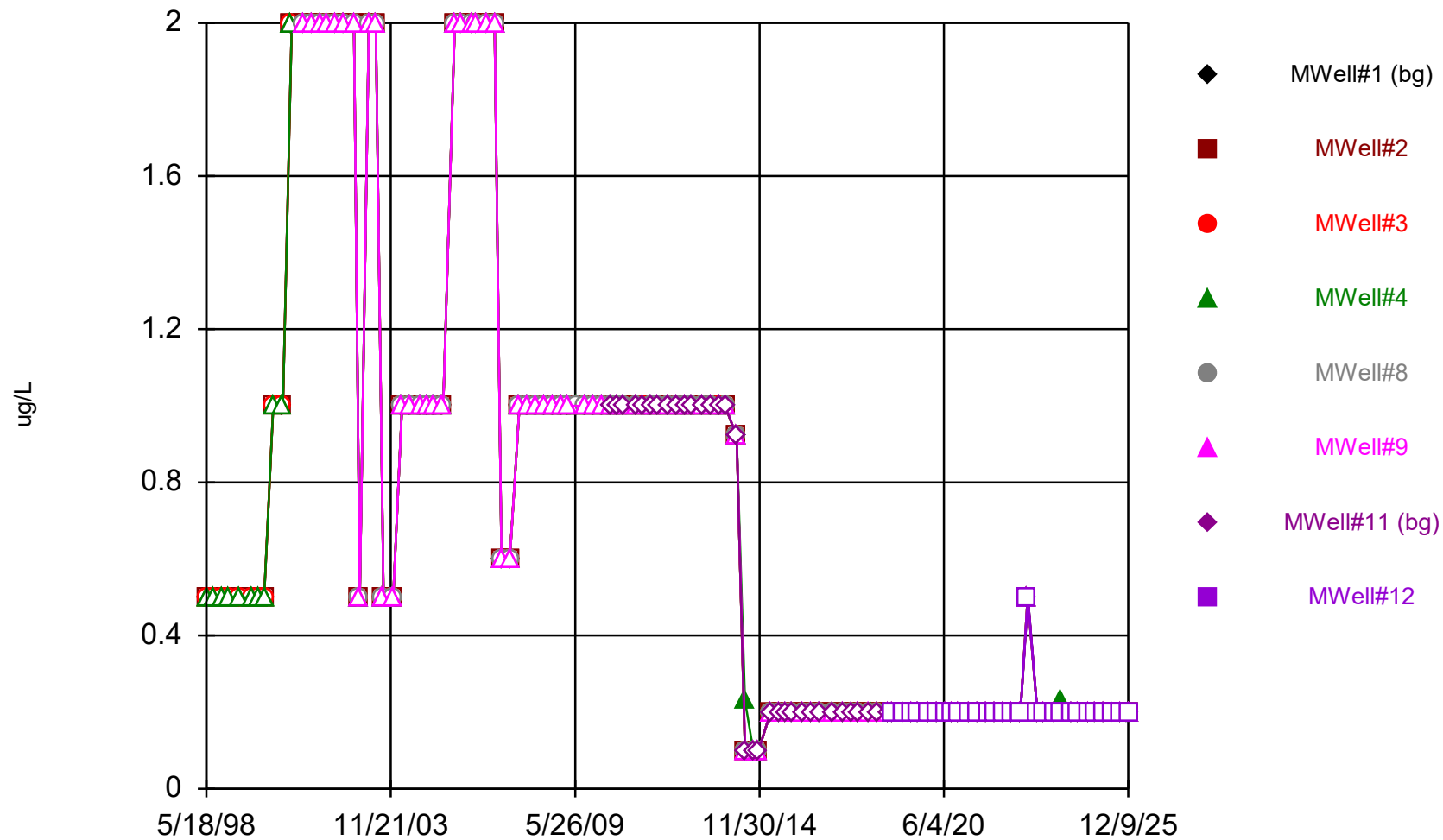
Constituent: 1,1-Dichloroethene Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



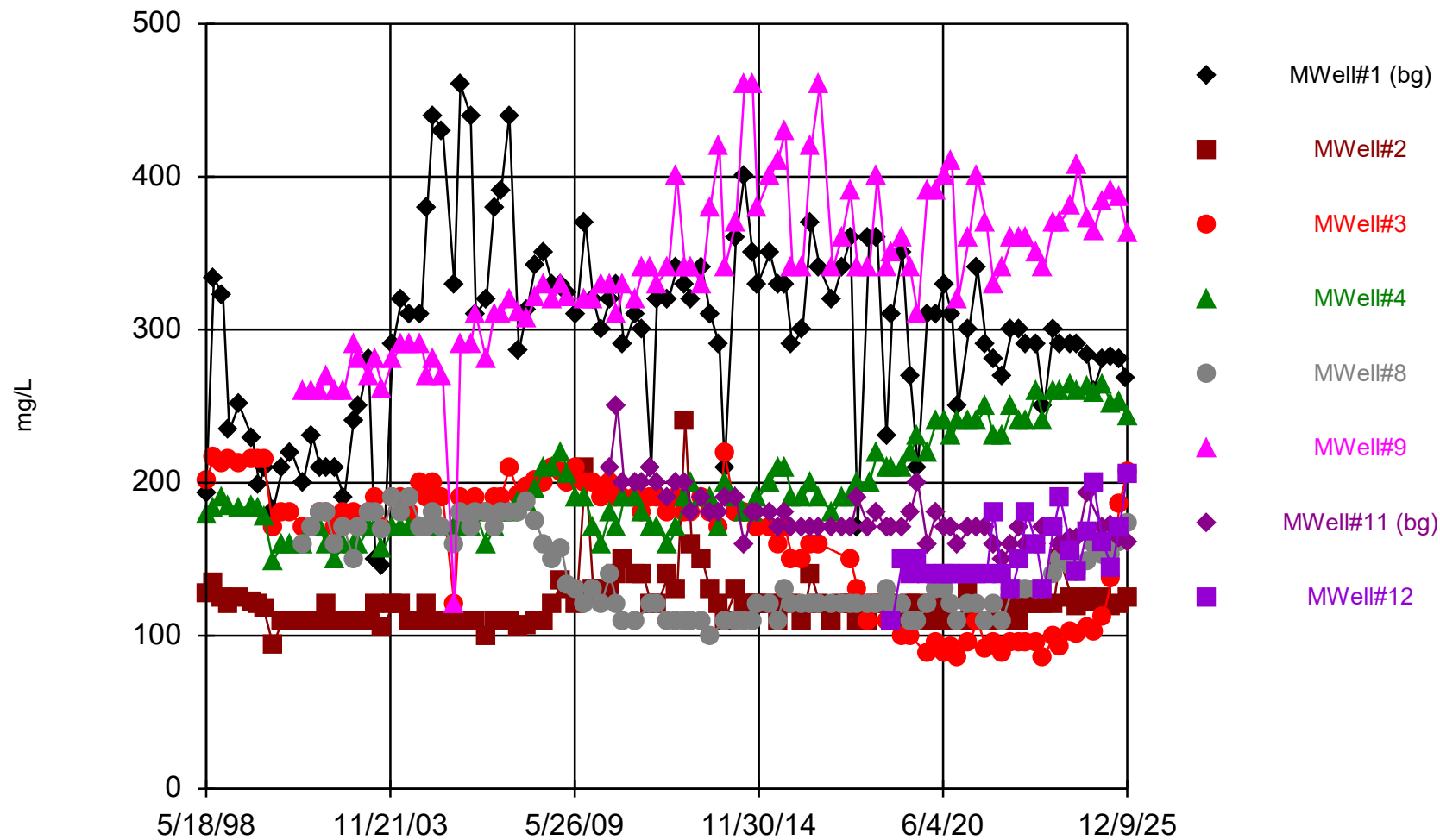
Constituent: 1,2-Dichloroethane Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



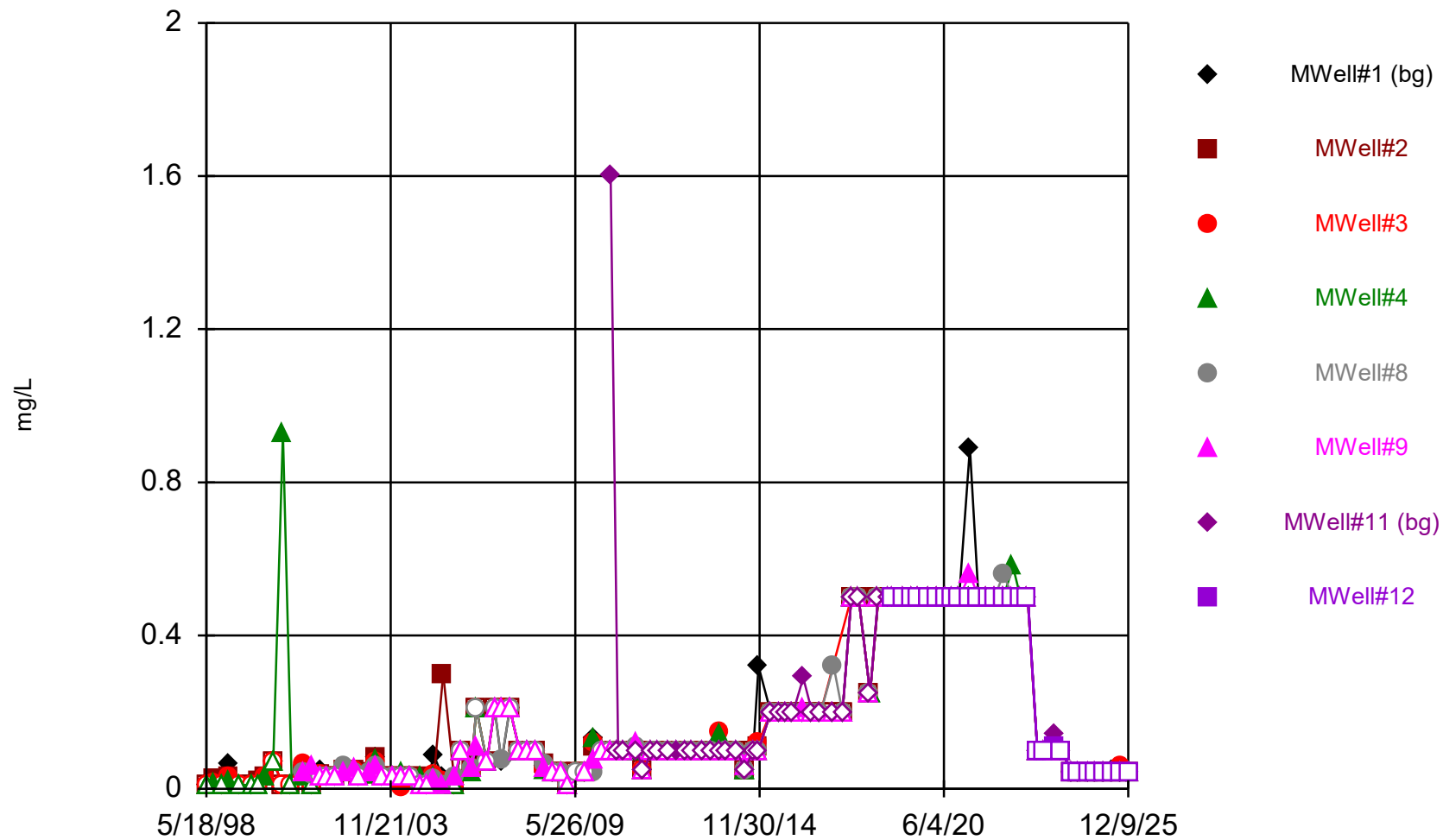
Constituent: 1,2-Dichloropropane Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



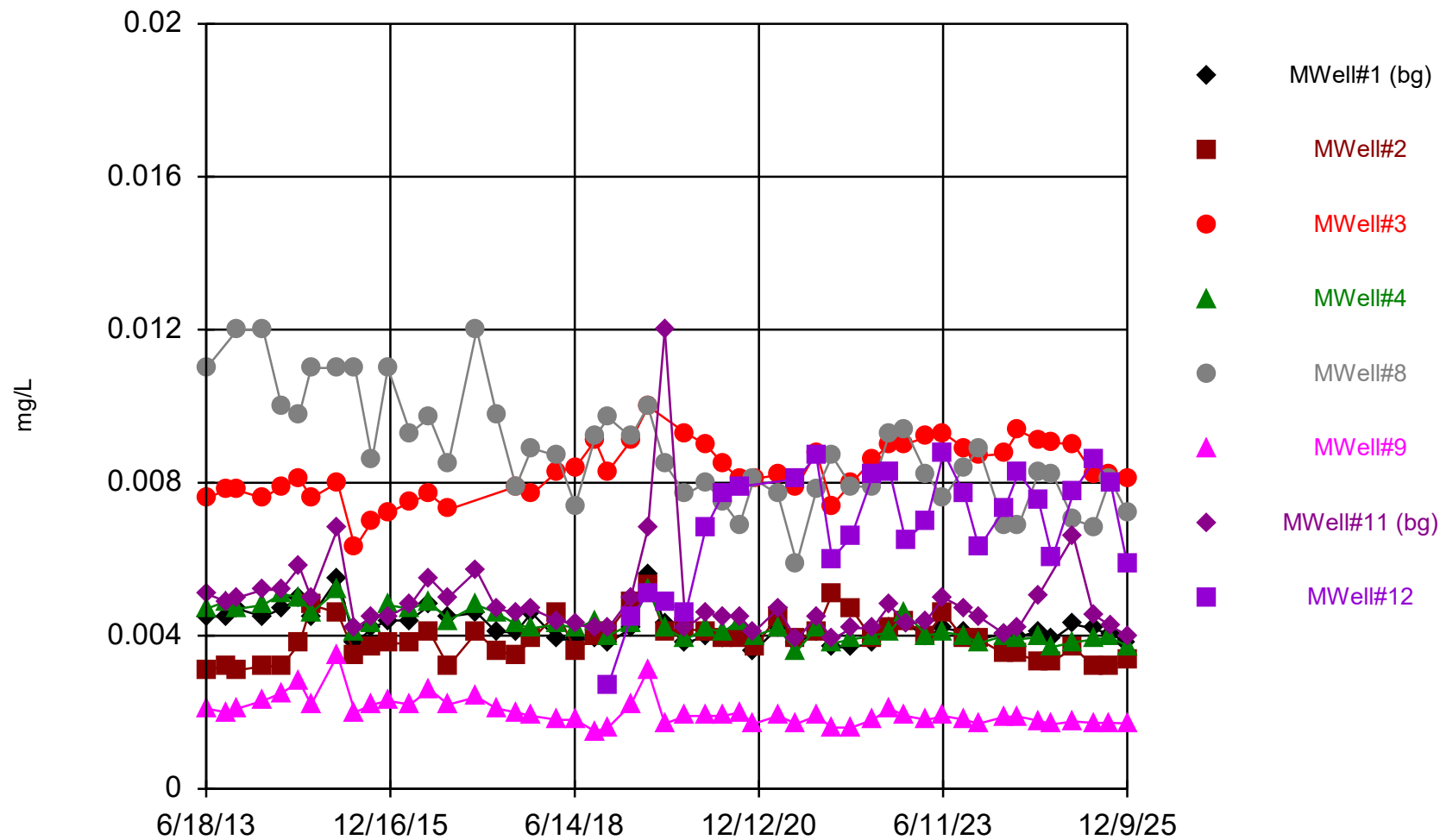
Constituent: Alkalinity, Bicarbonate Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Ammonia Nitrogen Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

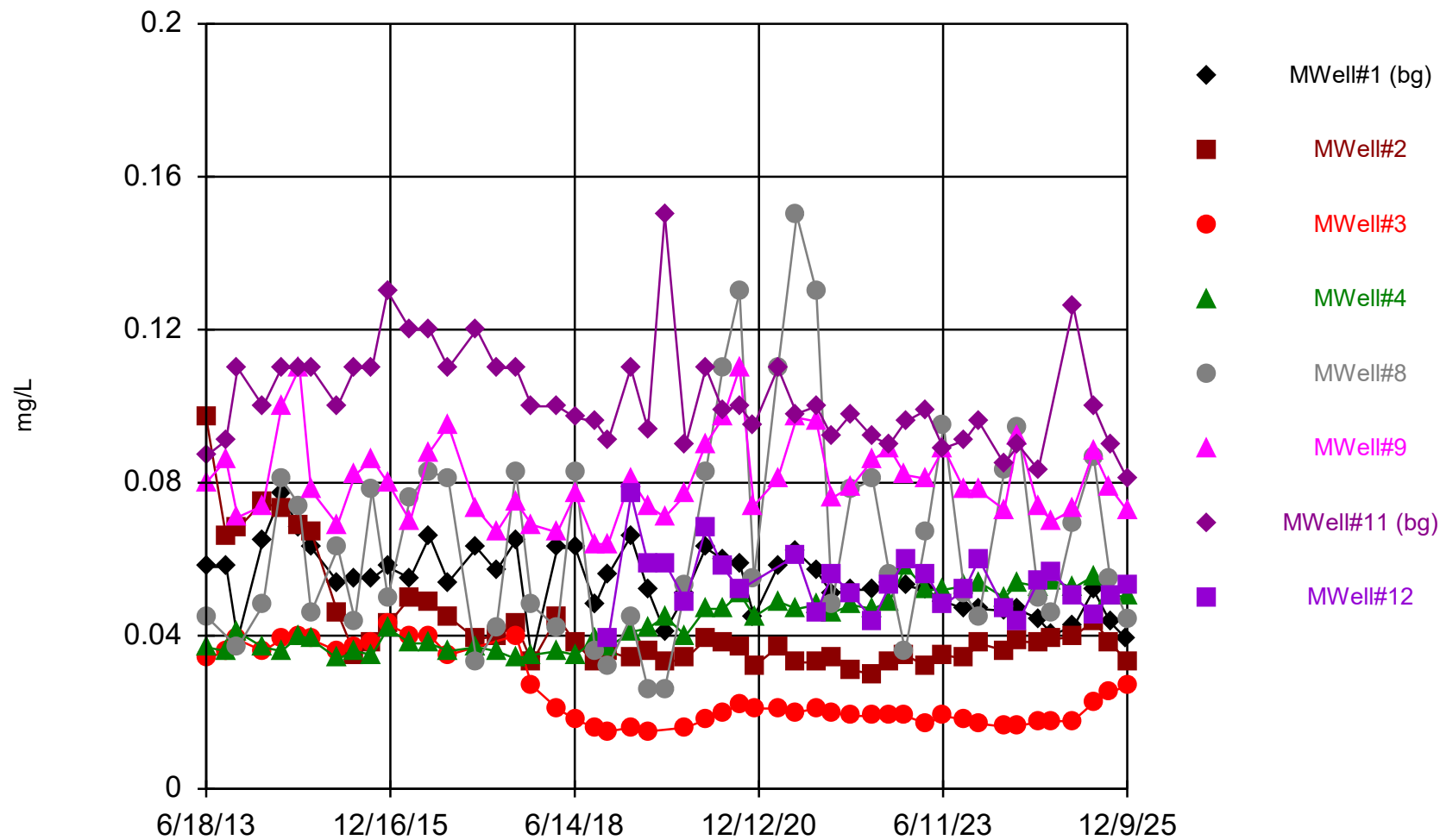
Time Series



Constituent: Arsenic, Total Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

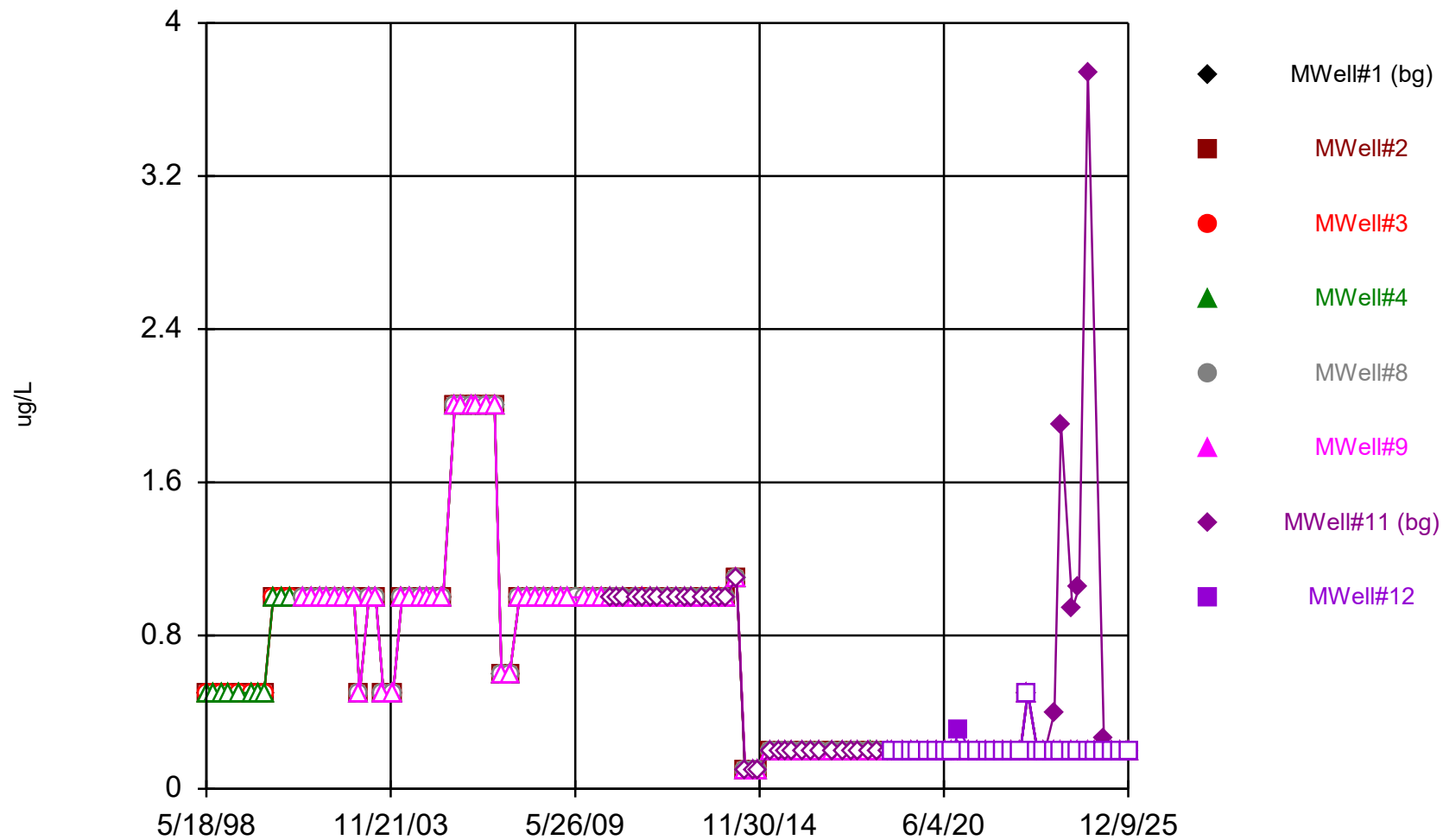
Time Series



Constituent: Barium, Total Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

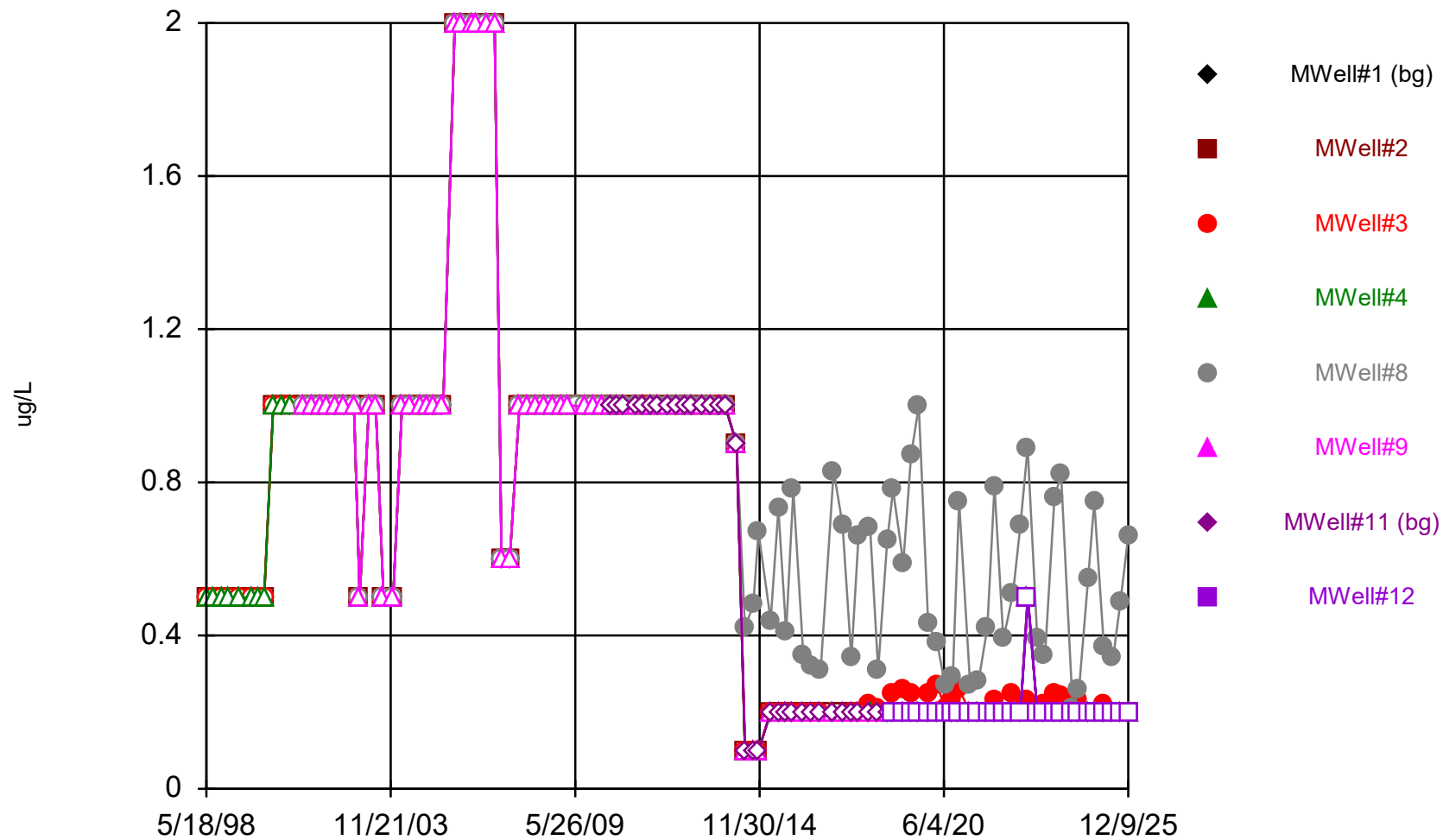
Time Series



Constituent: Benzene Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1

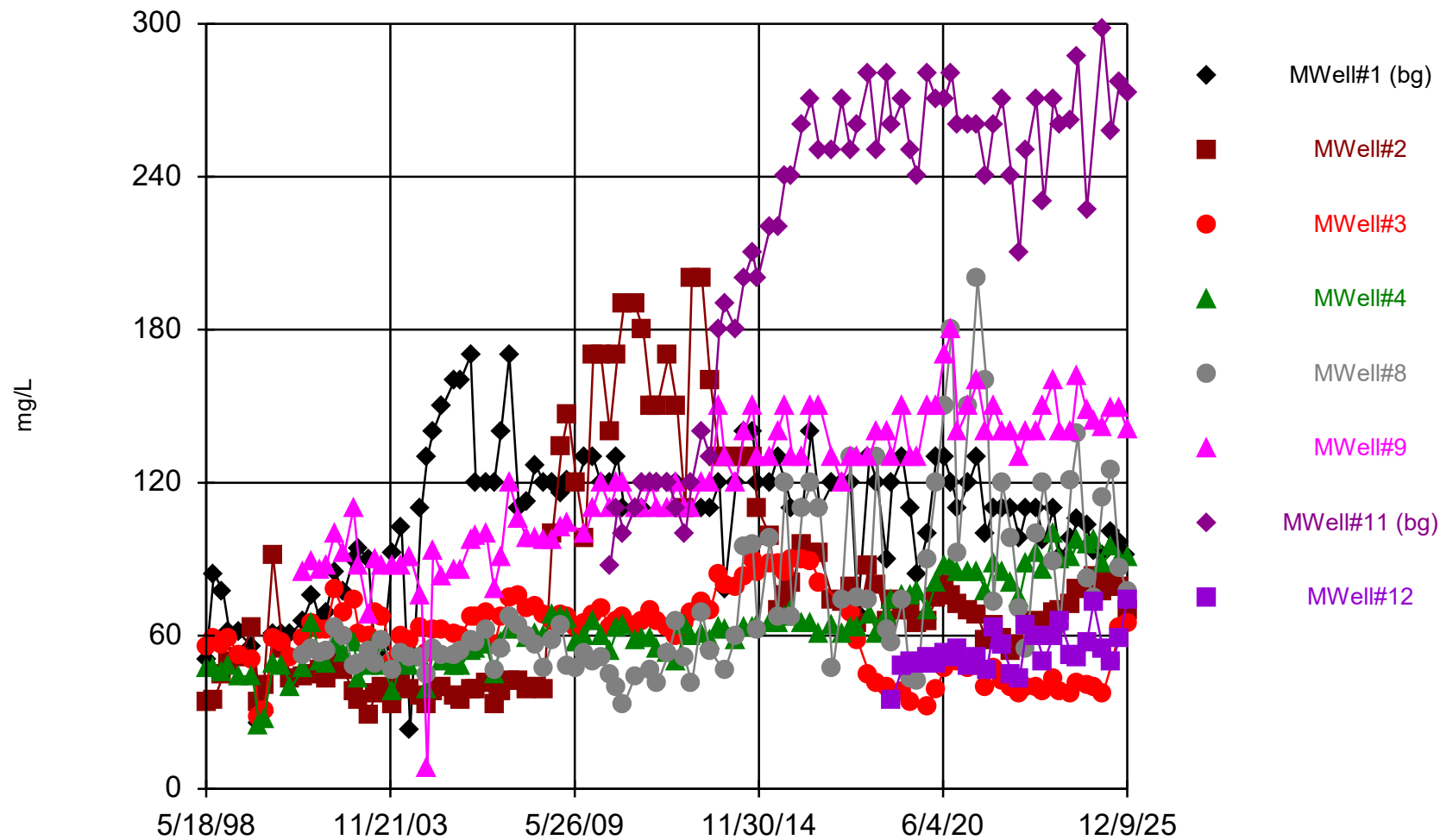
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



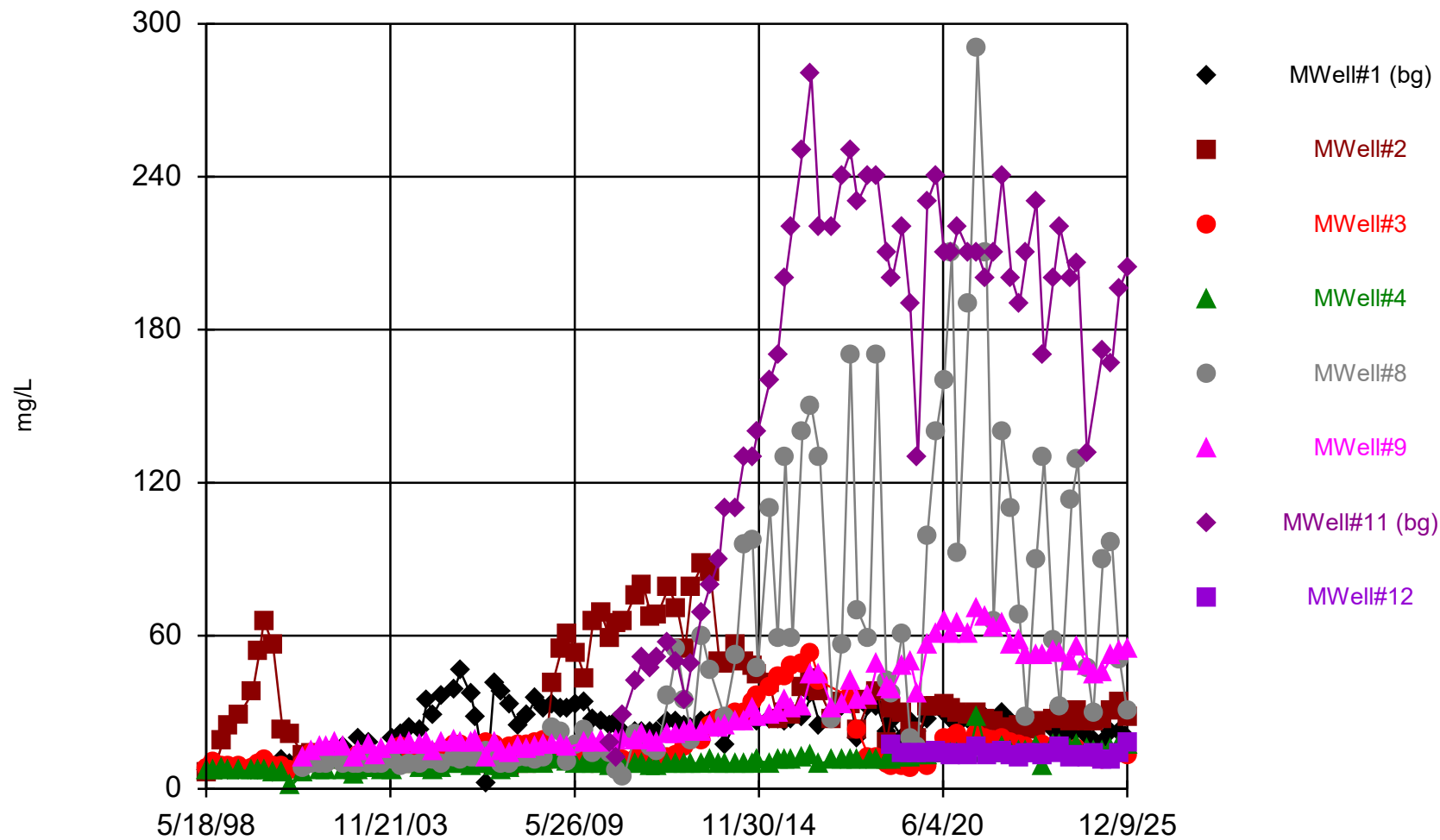
Constituent: Bromodichloromethane Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Calcium, Dissolved Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

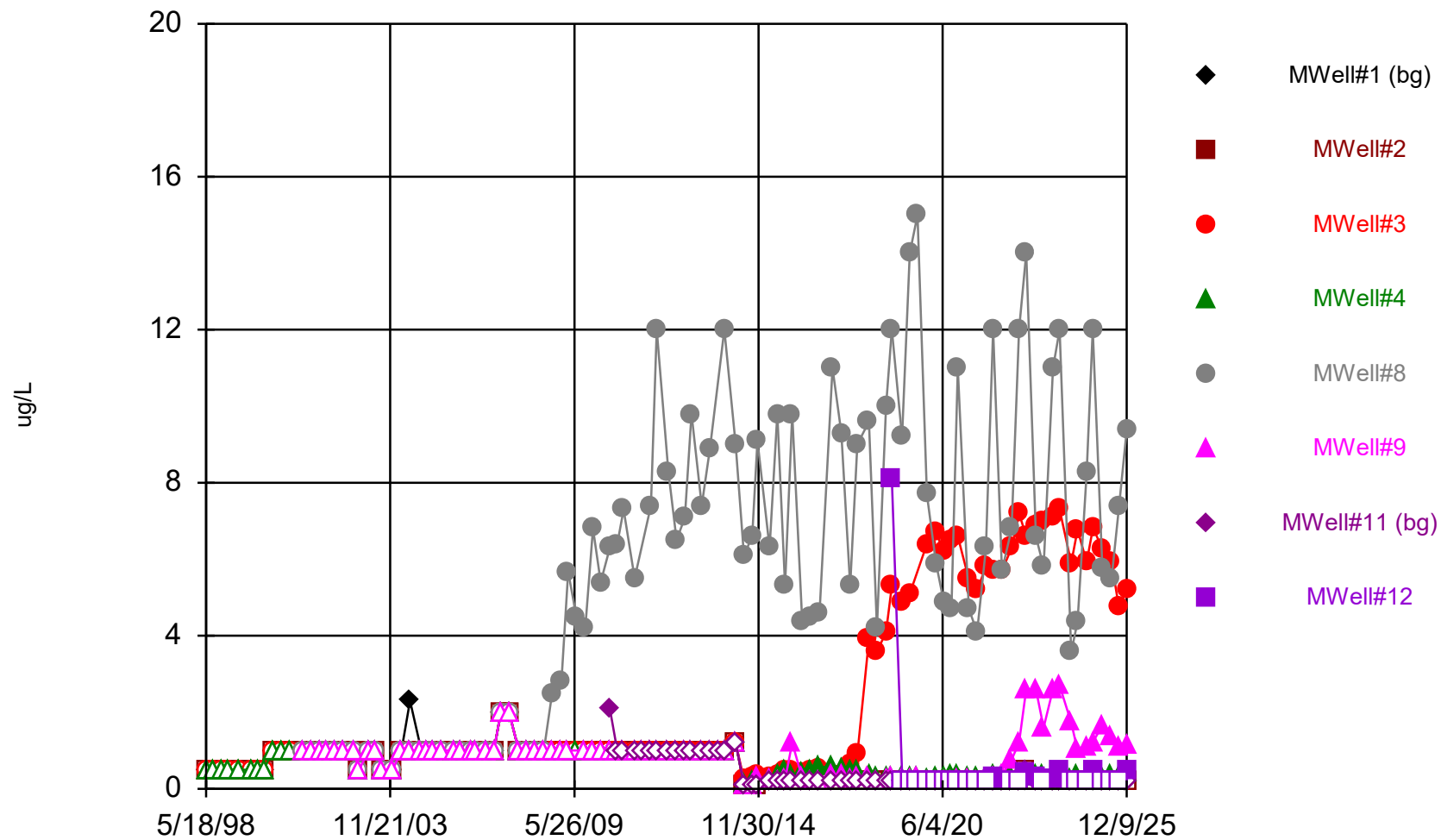
Time Series



Constituent: Chloride Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

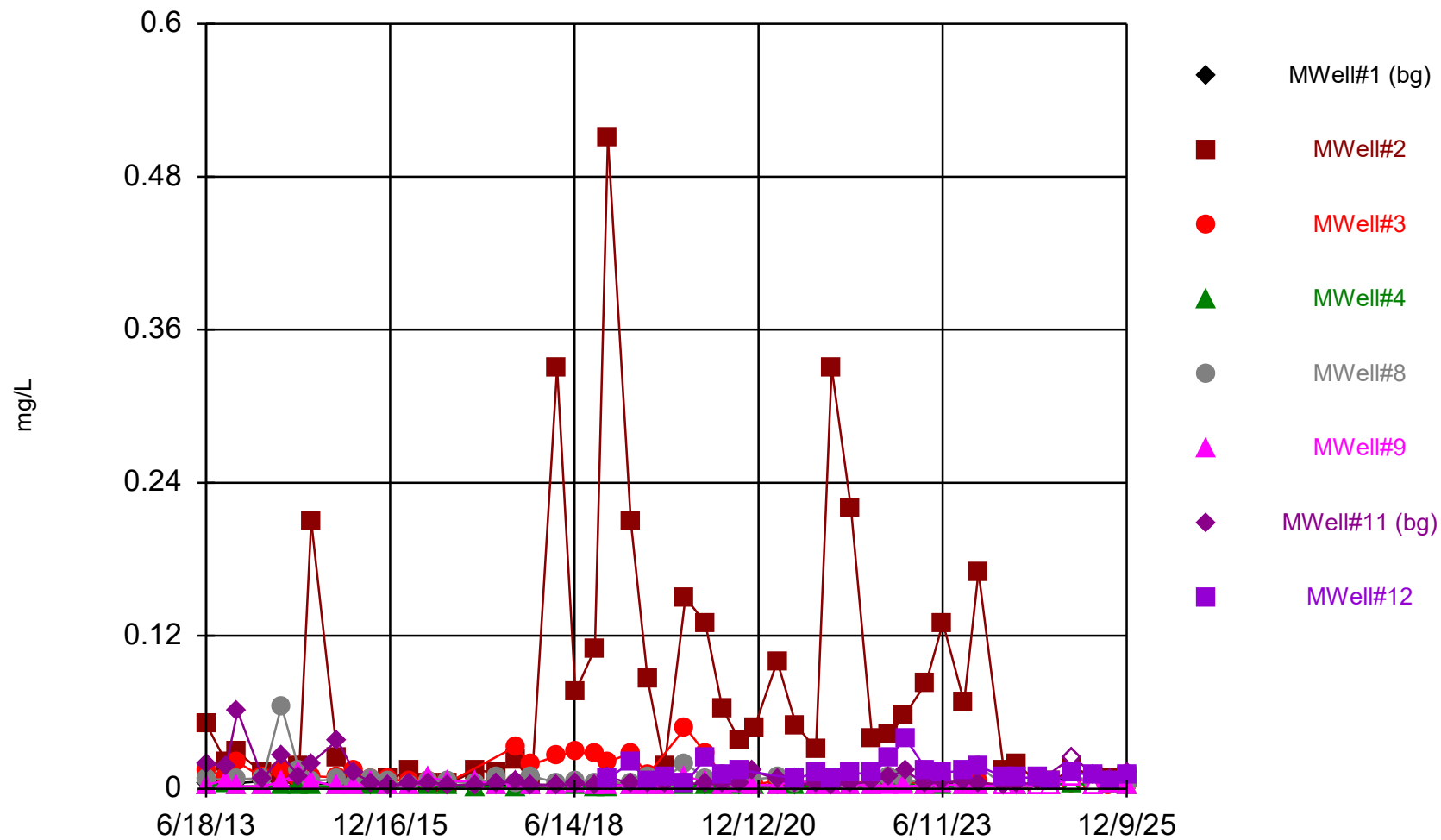
Time Series



Constituent: Chloroform Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1

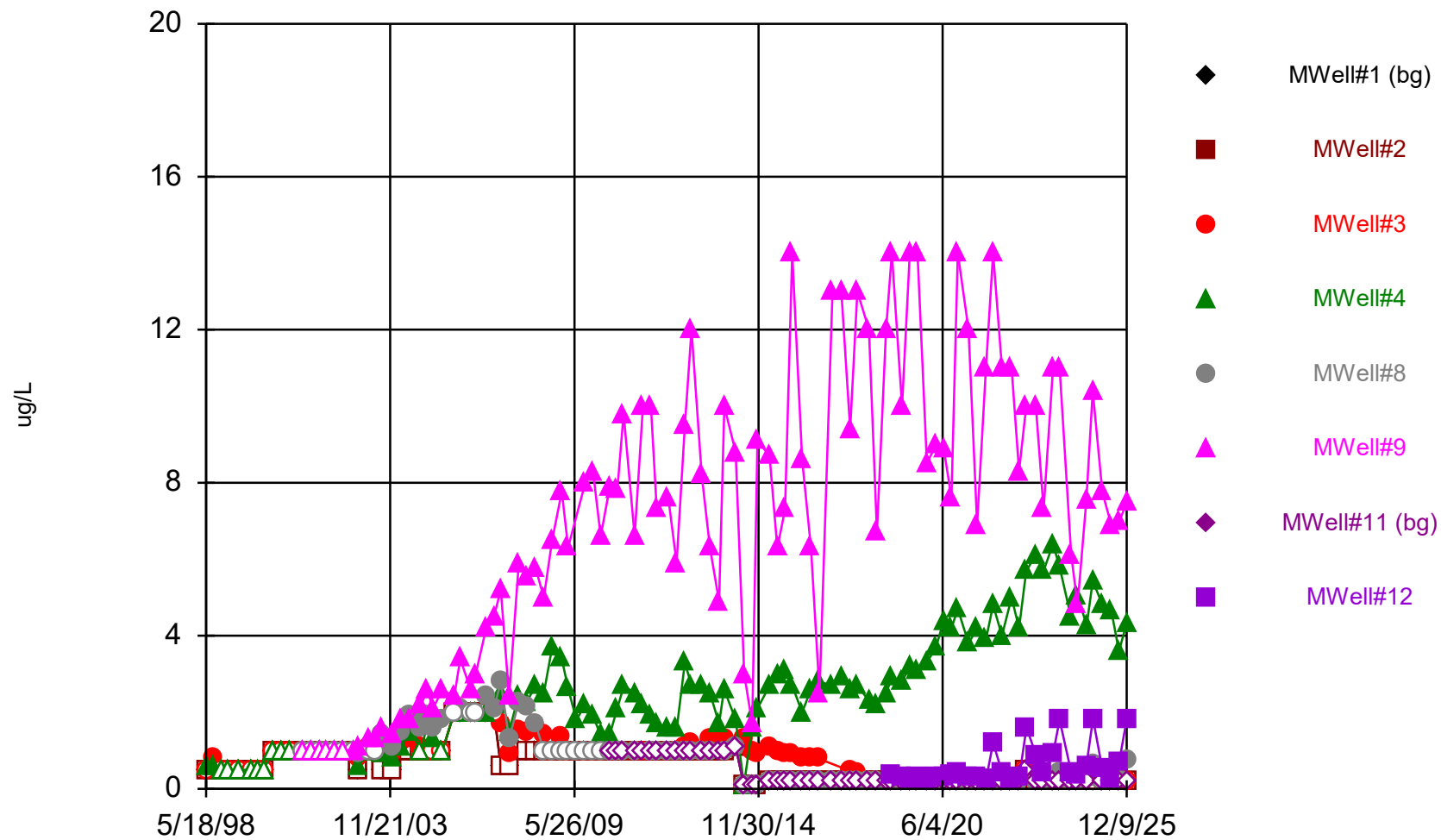
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



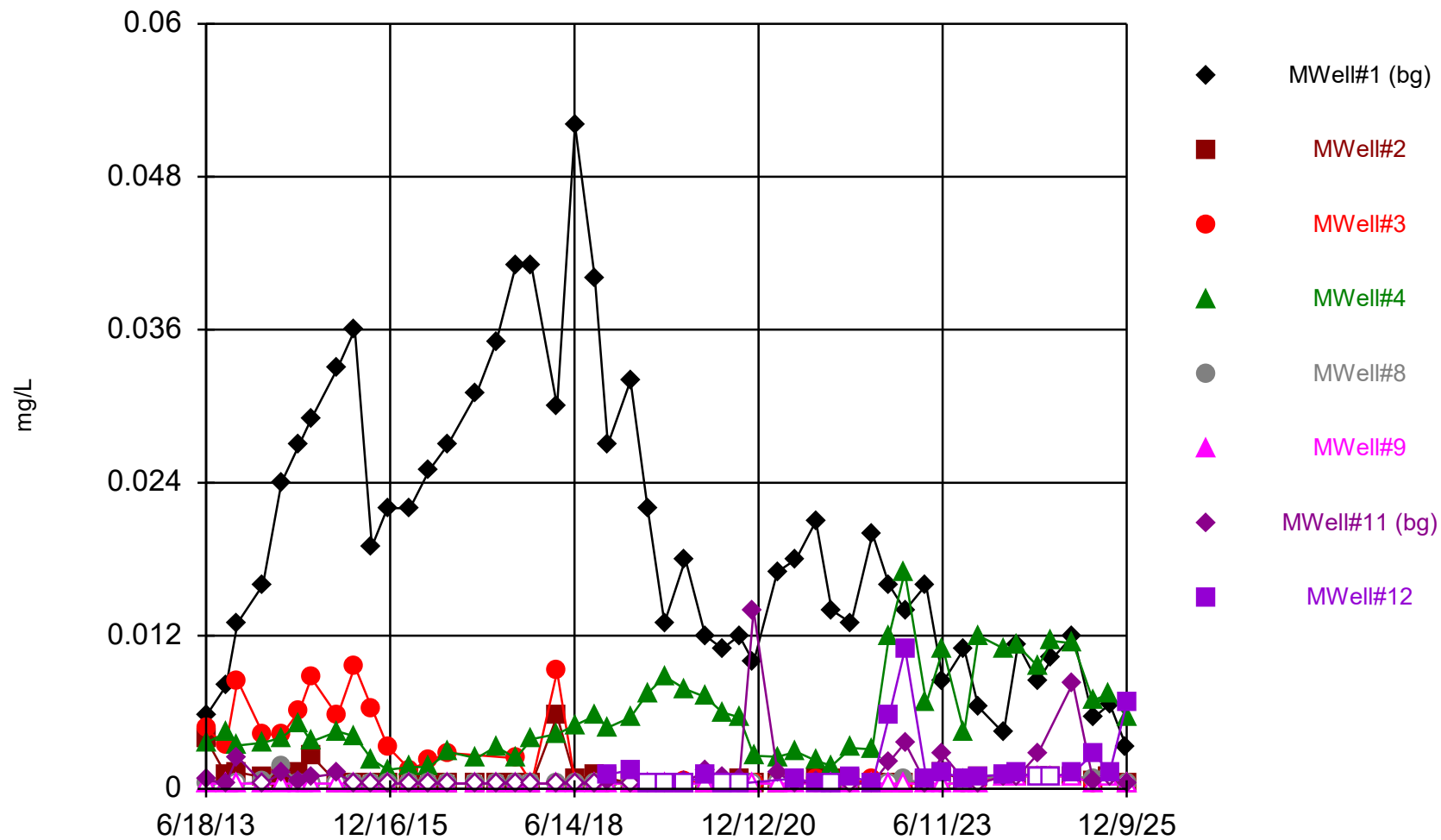
Constituent: Chromium, Total Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



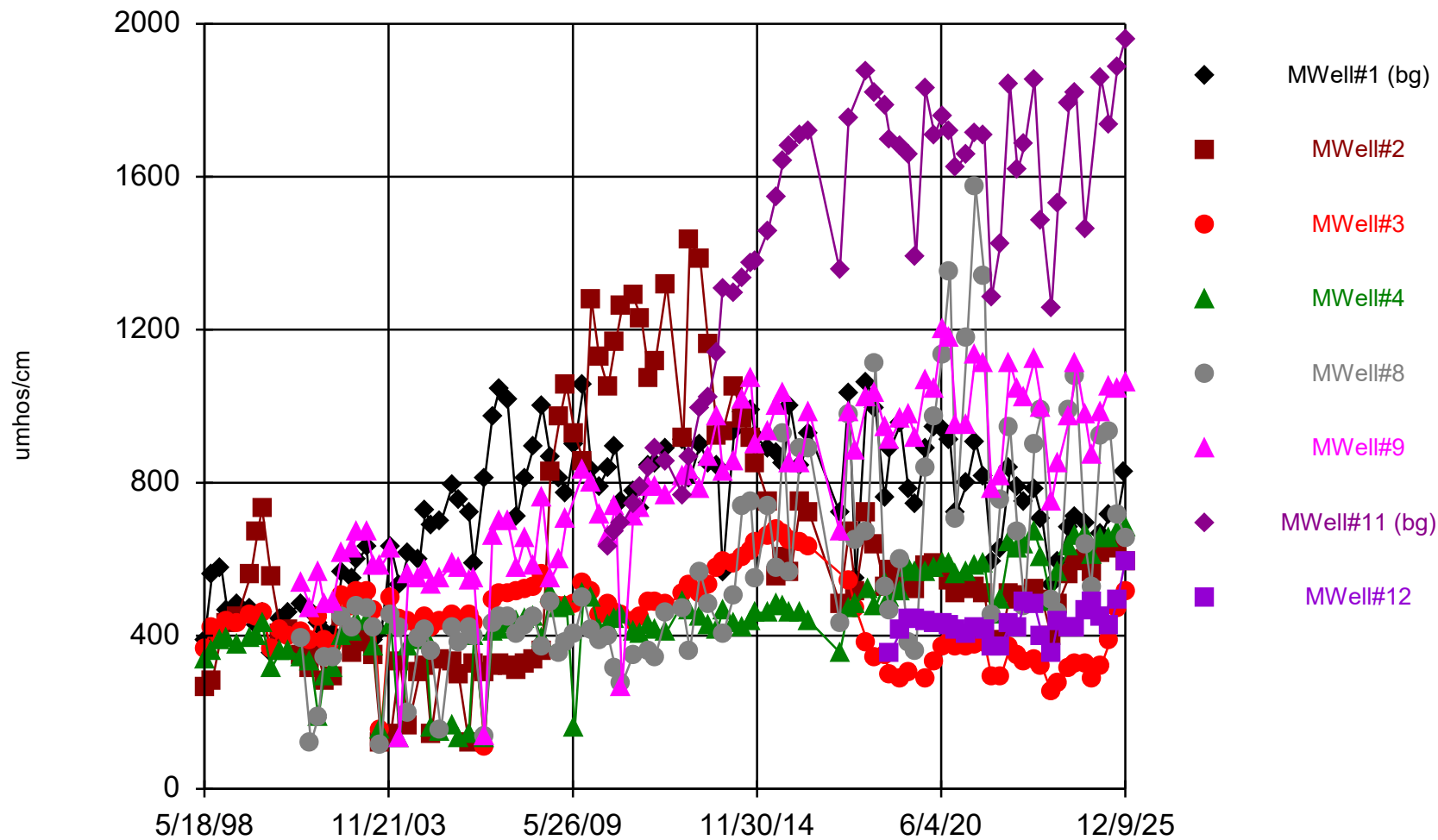
Constituent: cis-1,2-Dichloroethene Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Cobalt, Total Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

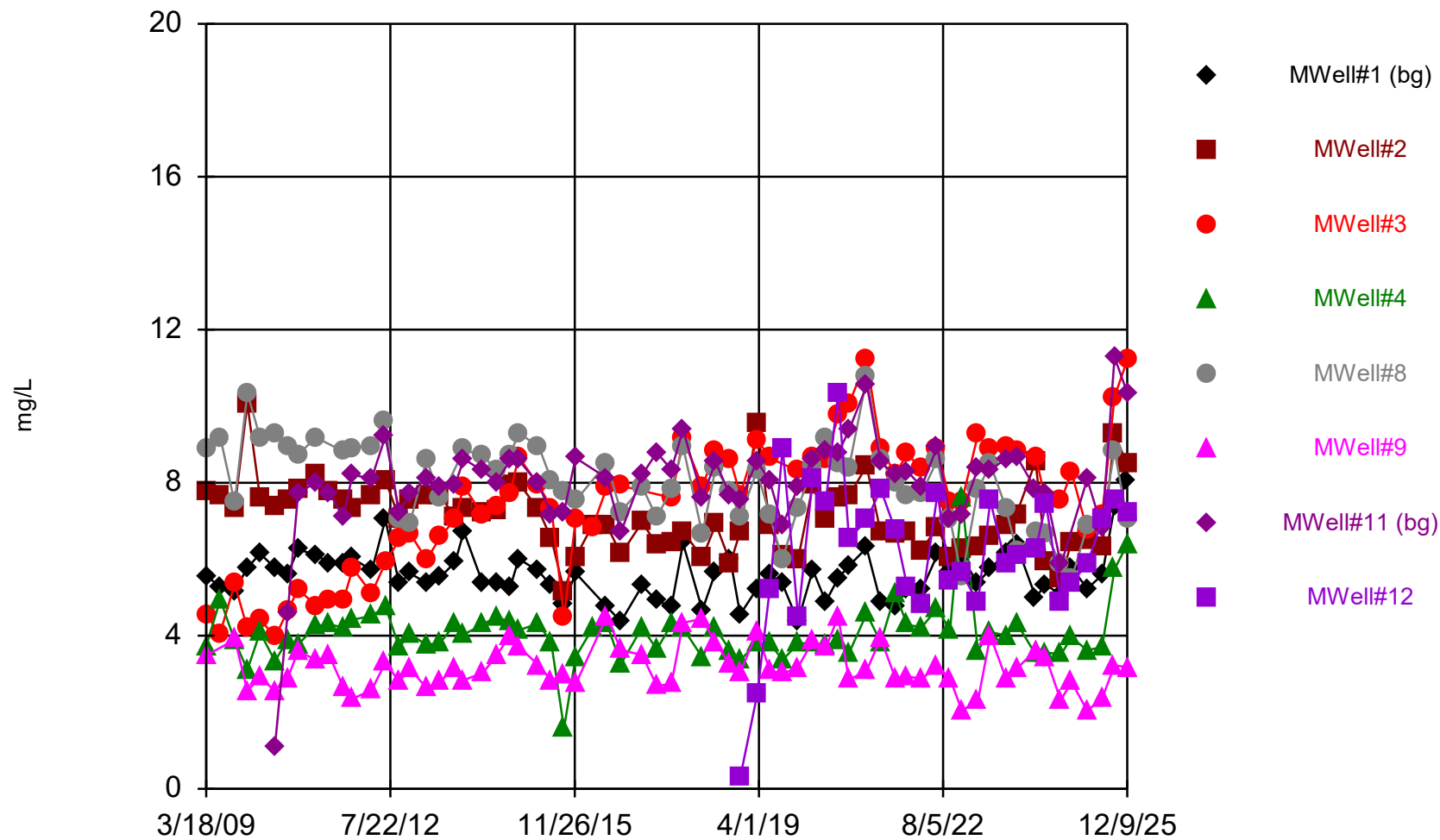
Time Series



Constituent: Conductivity Analysis Run 2/13/2026 2:20 PM View: HRLF_TSP Set1

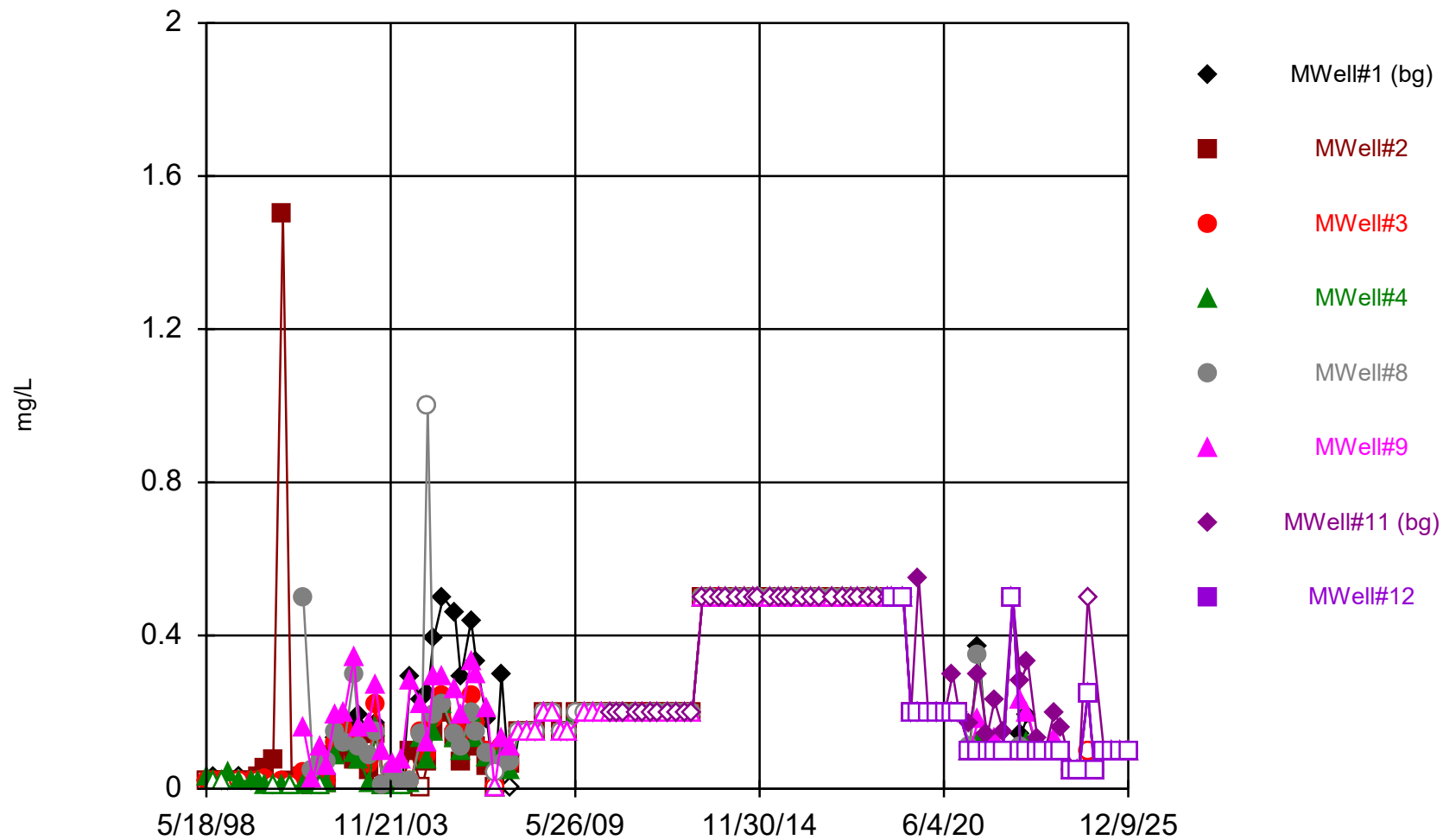
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Dissolved Oxygen Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

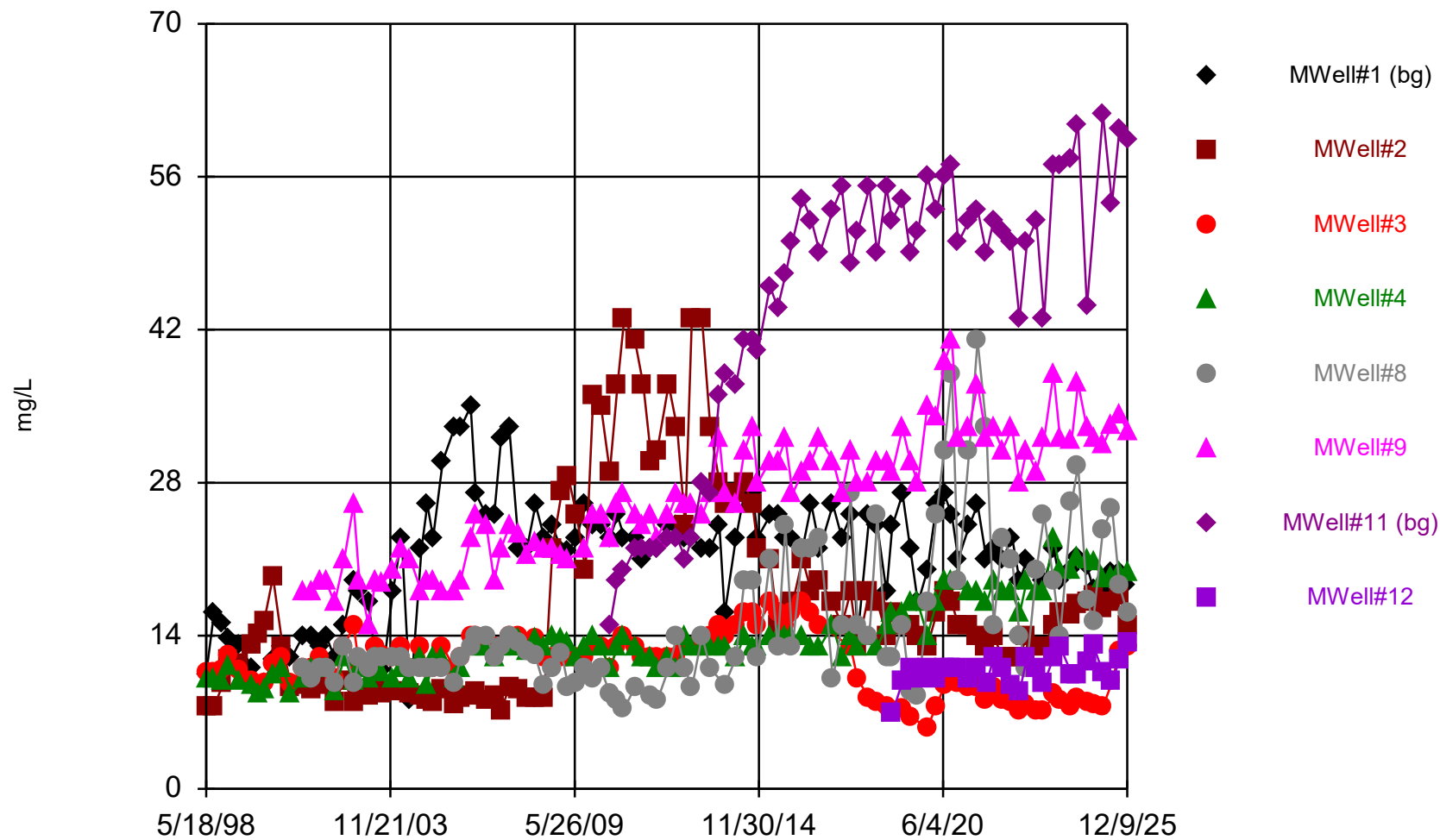
Time Series



Constituent: Iron, Dissolved Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1

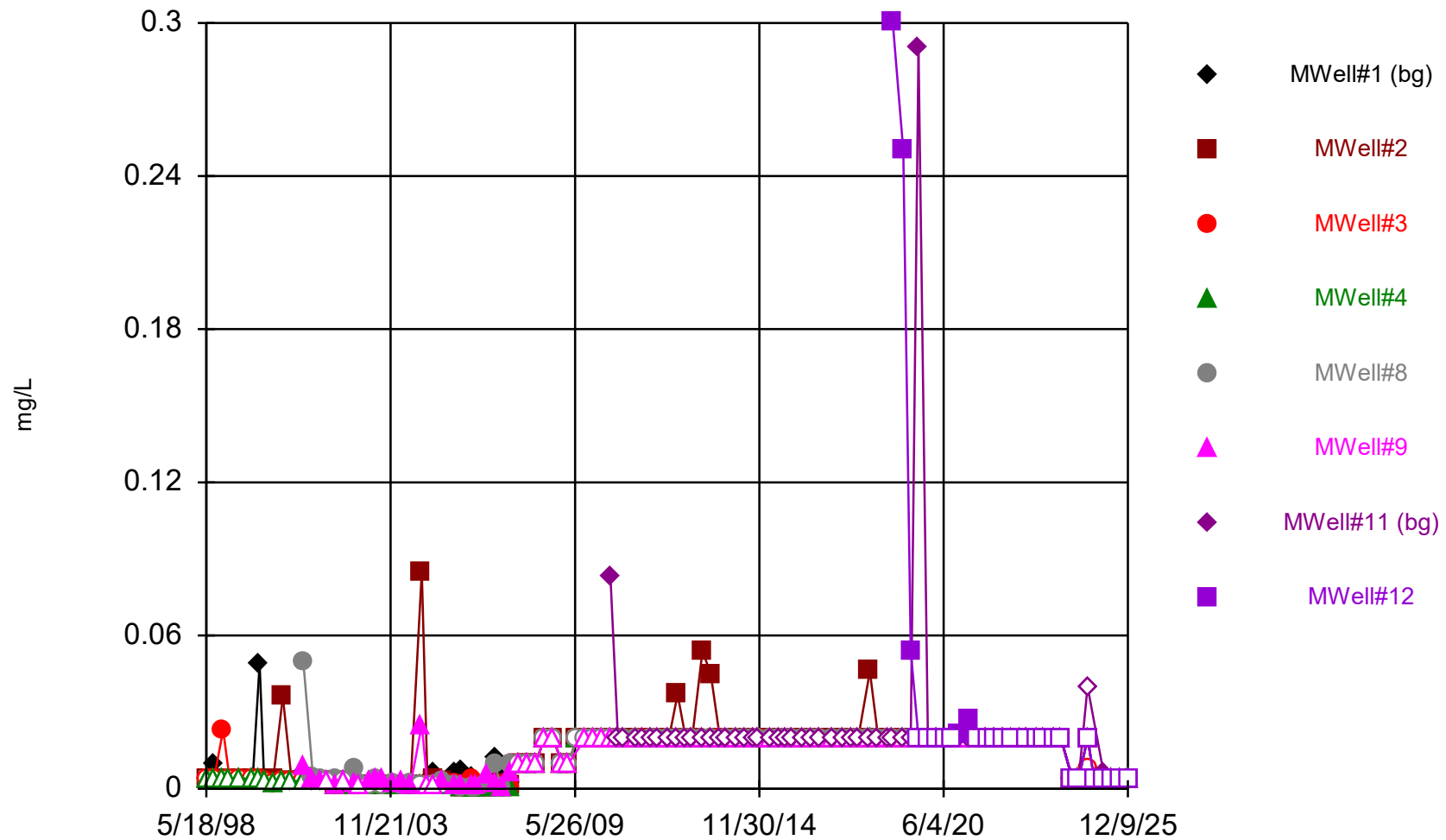
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



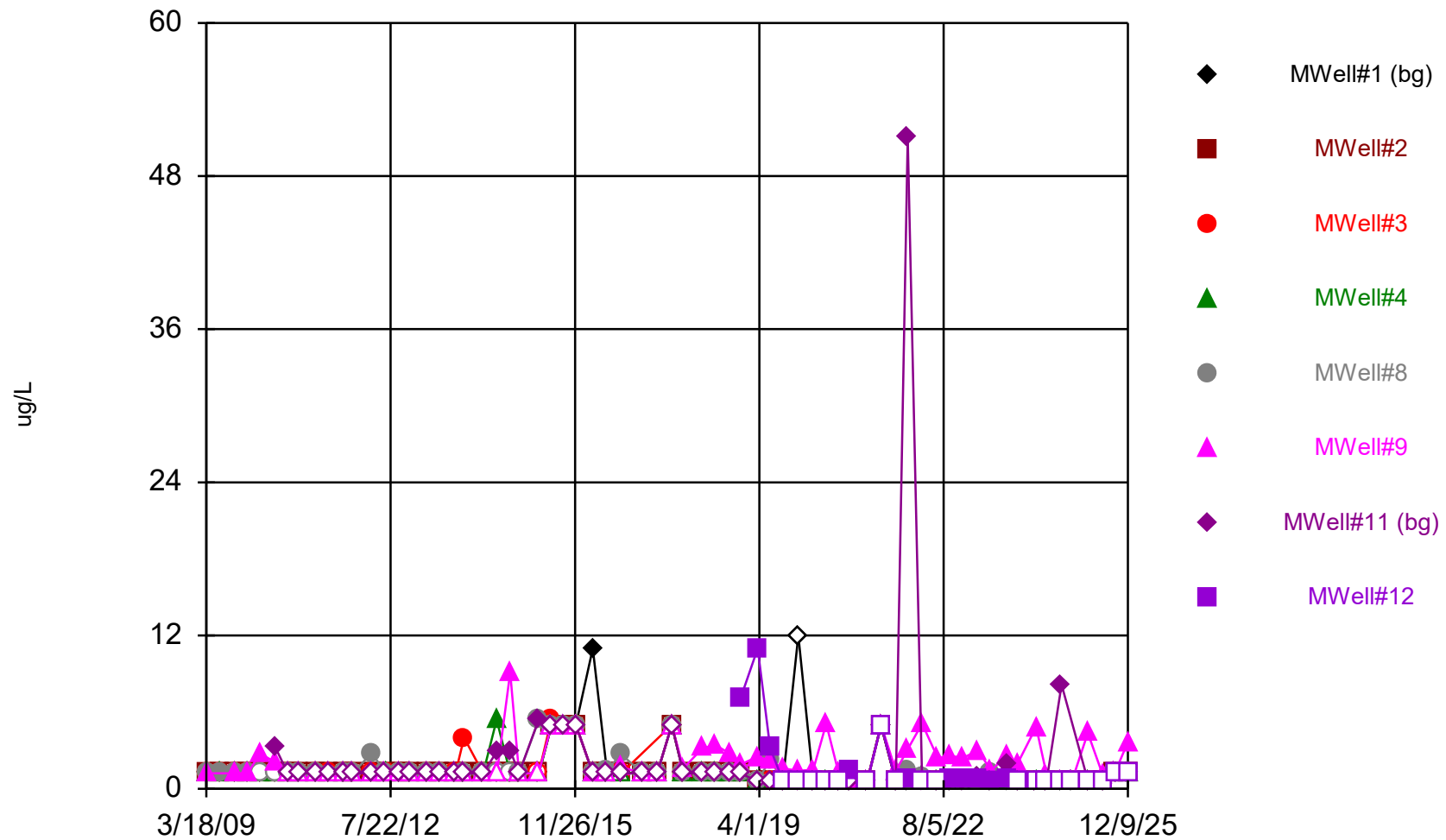
Constituent: Magnesium, Dissolved Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Manganese, Dissolved Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

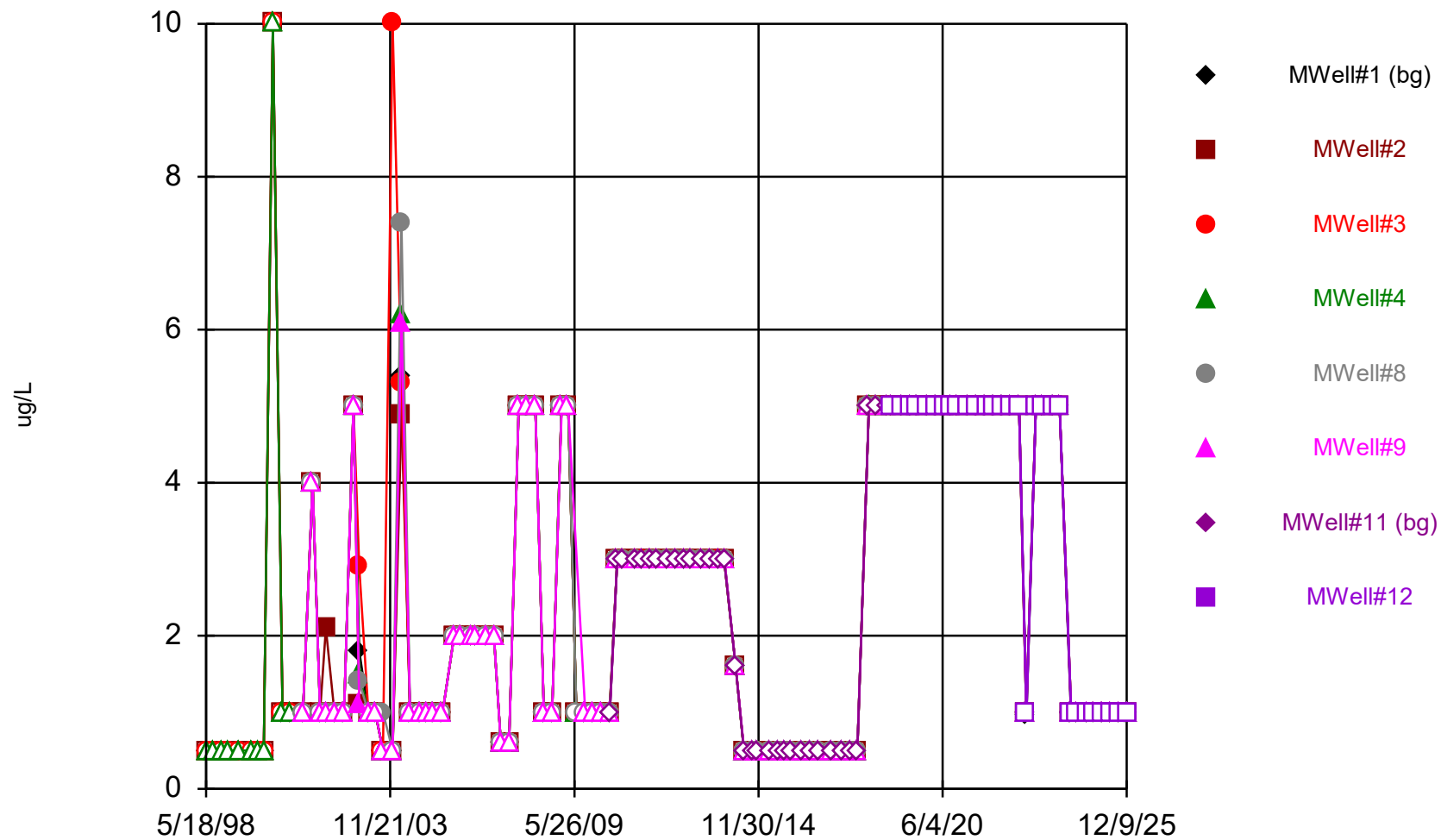
Time Series



Constituent: Methane Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1

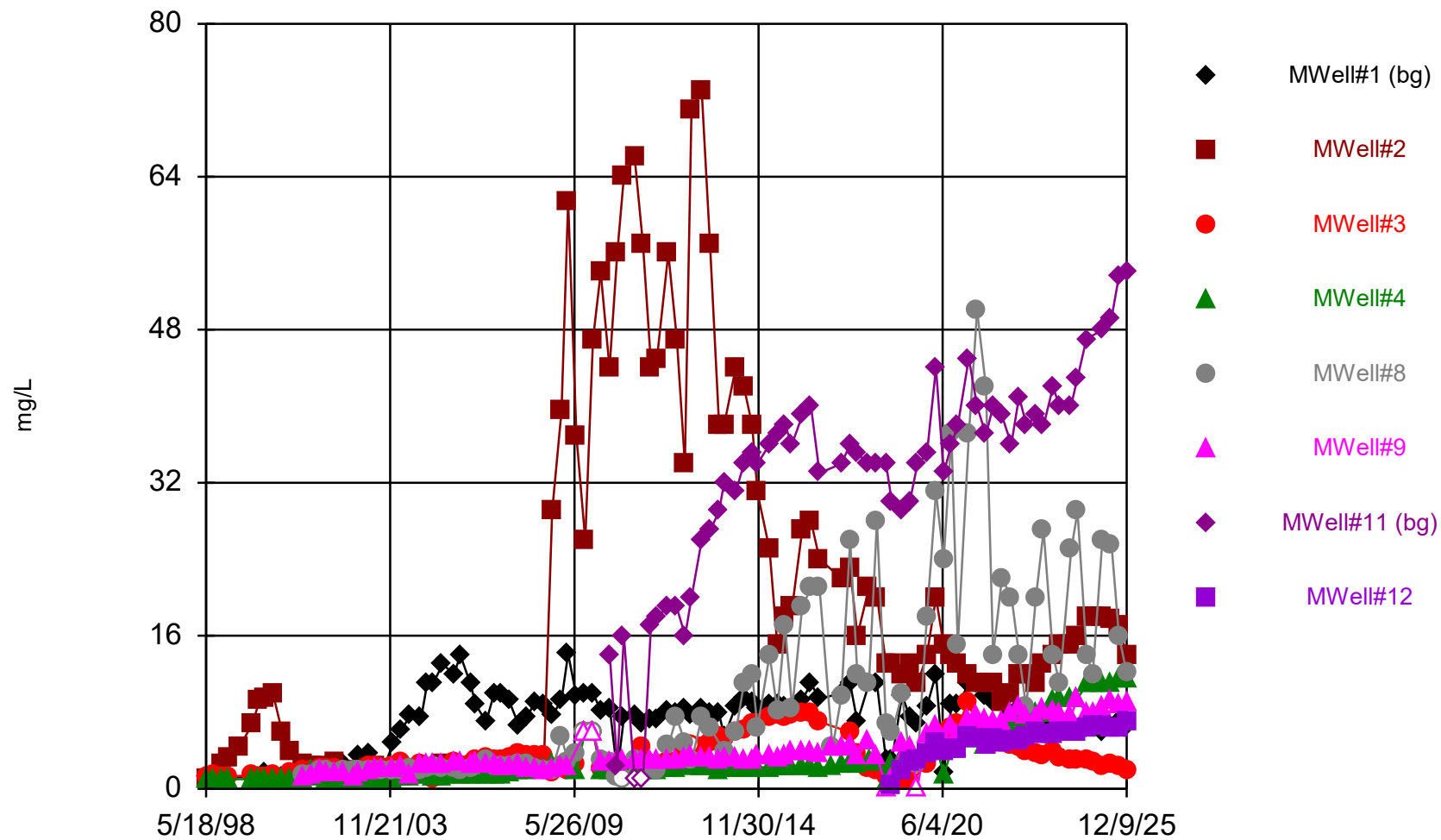
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Methylene Chloride Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

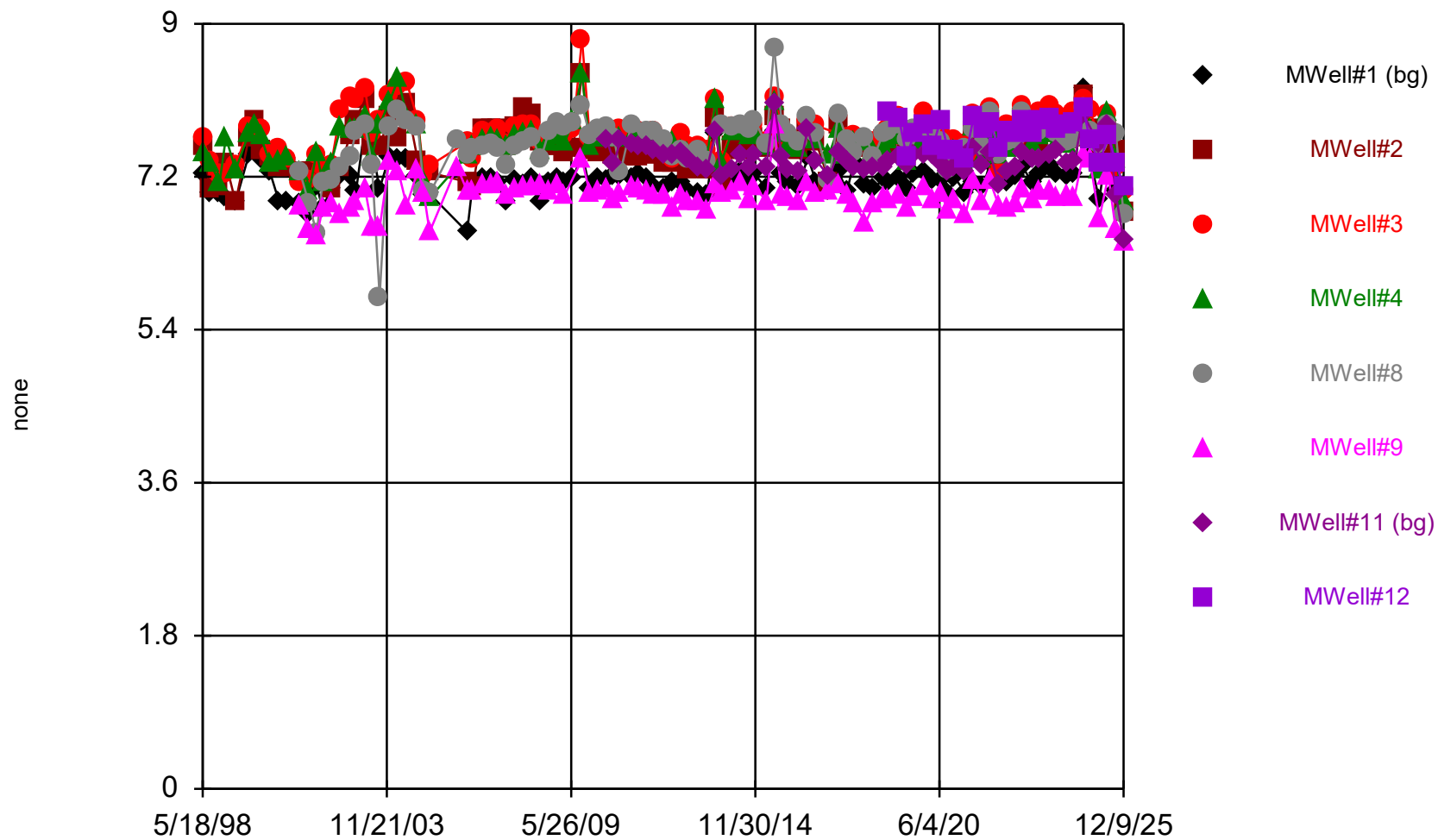
Time Series



Constituent: Nitrate Nitrogen Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

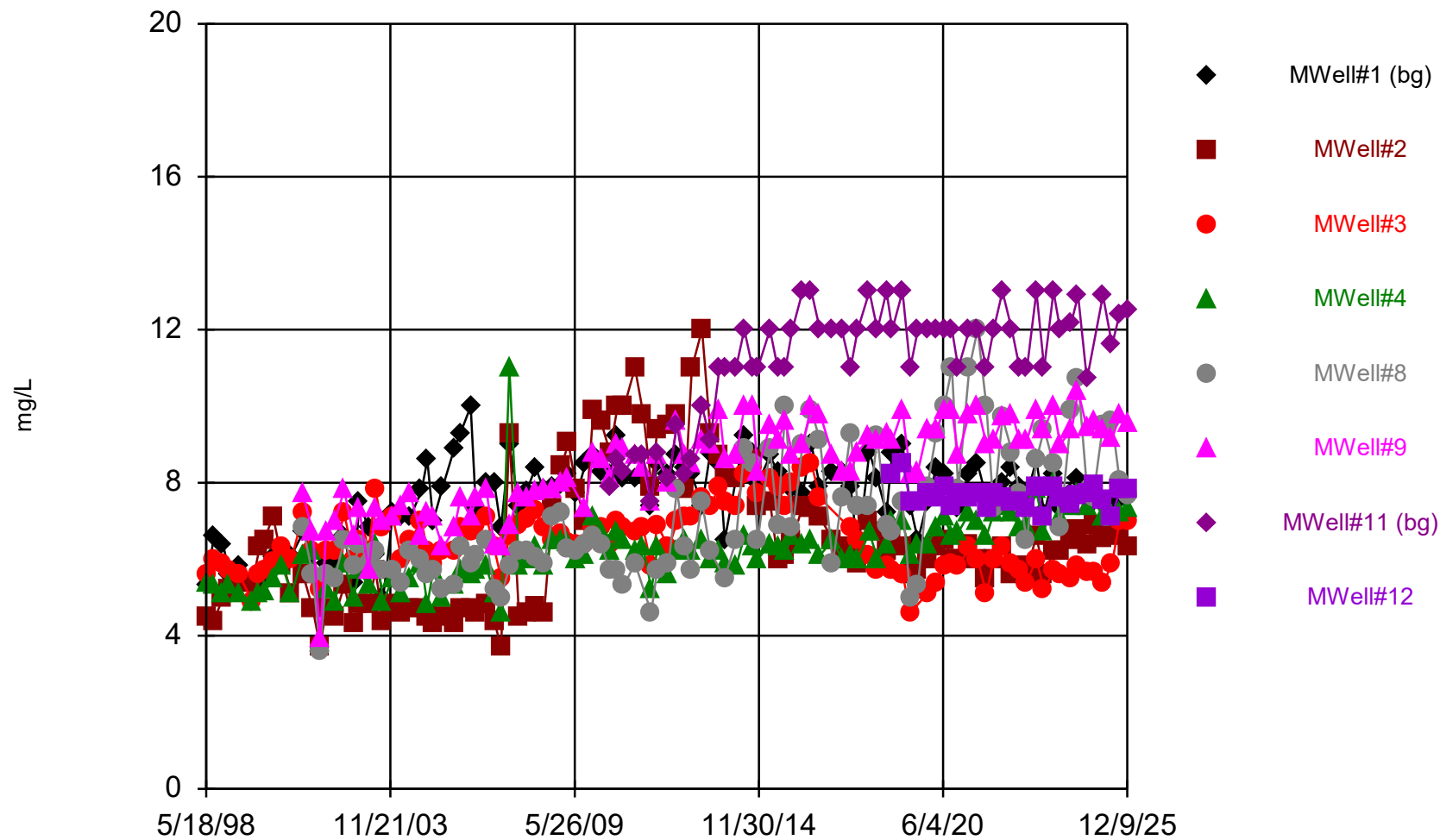
Time Series



Constituent: pH Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1

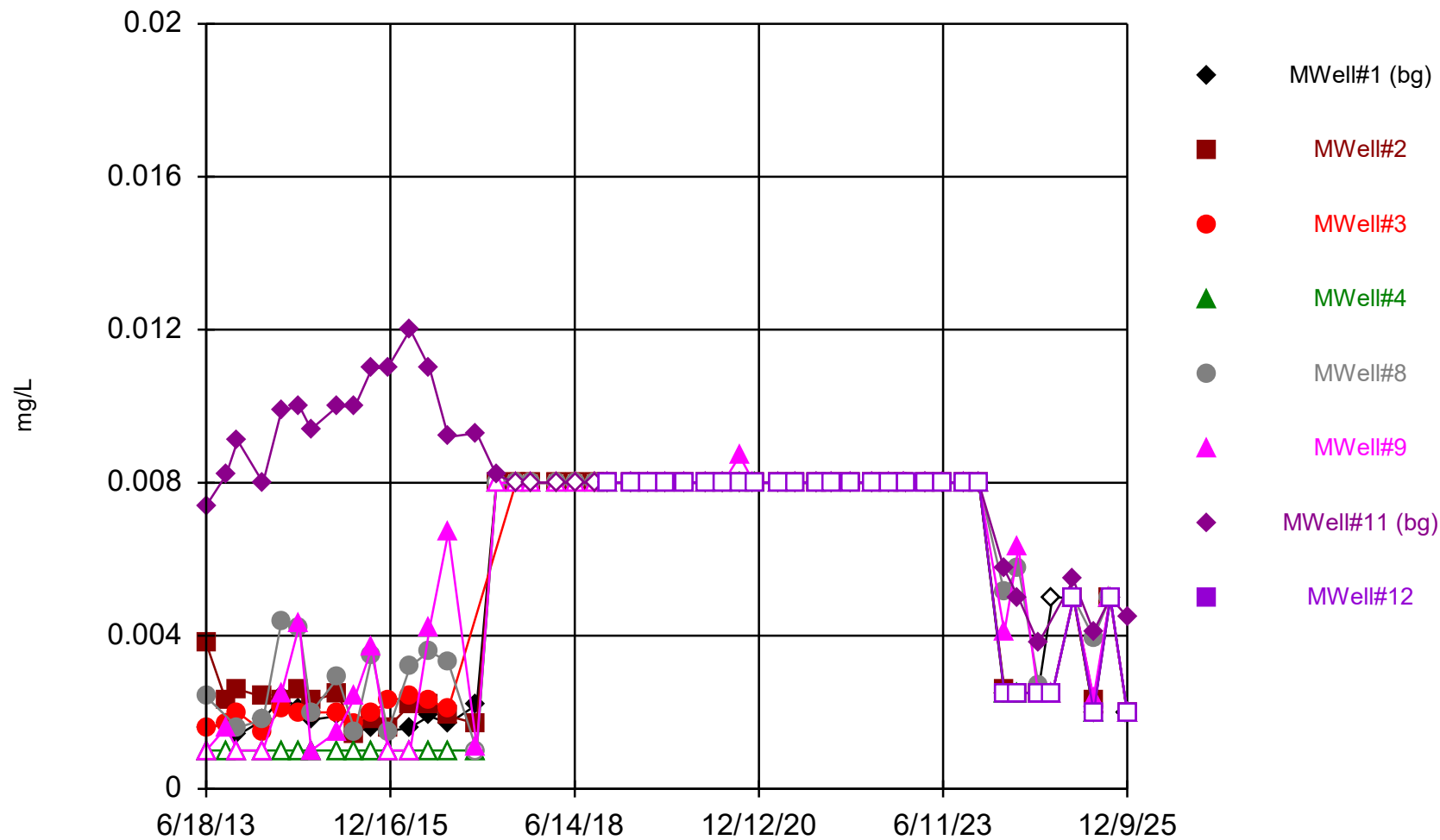
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Potassium, Dissolved Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

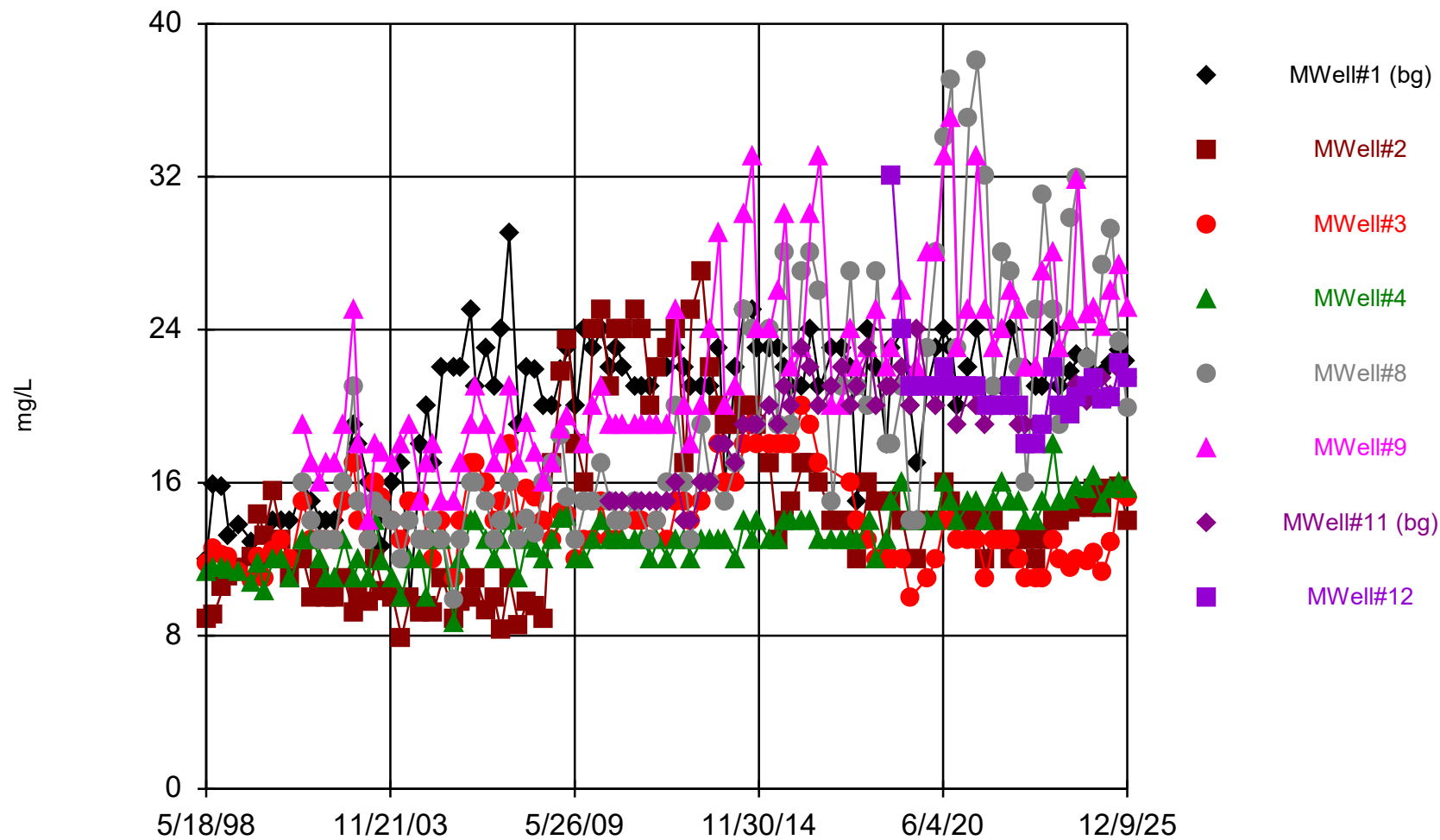
Time Series



Constituent: Selenium, Total Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1

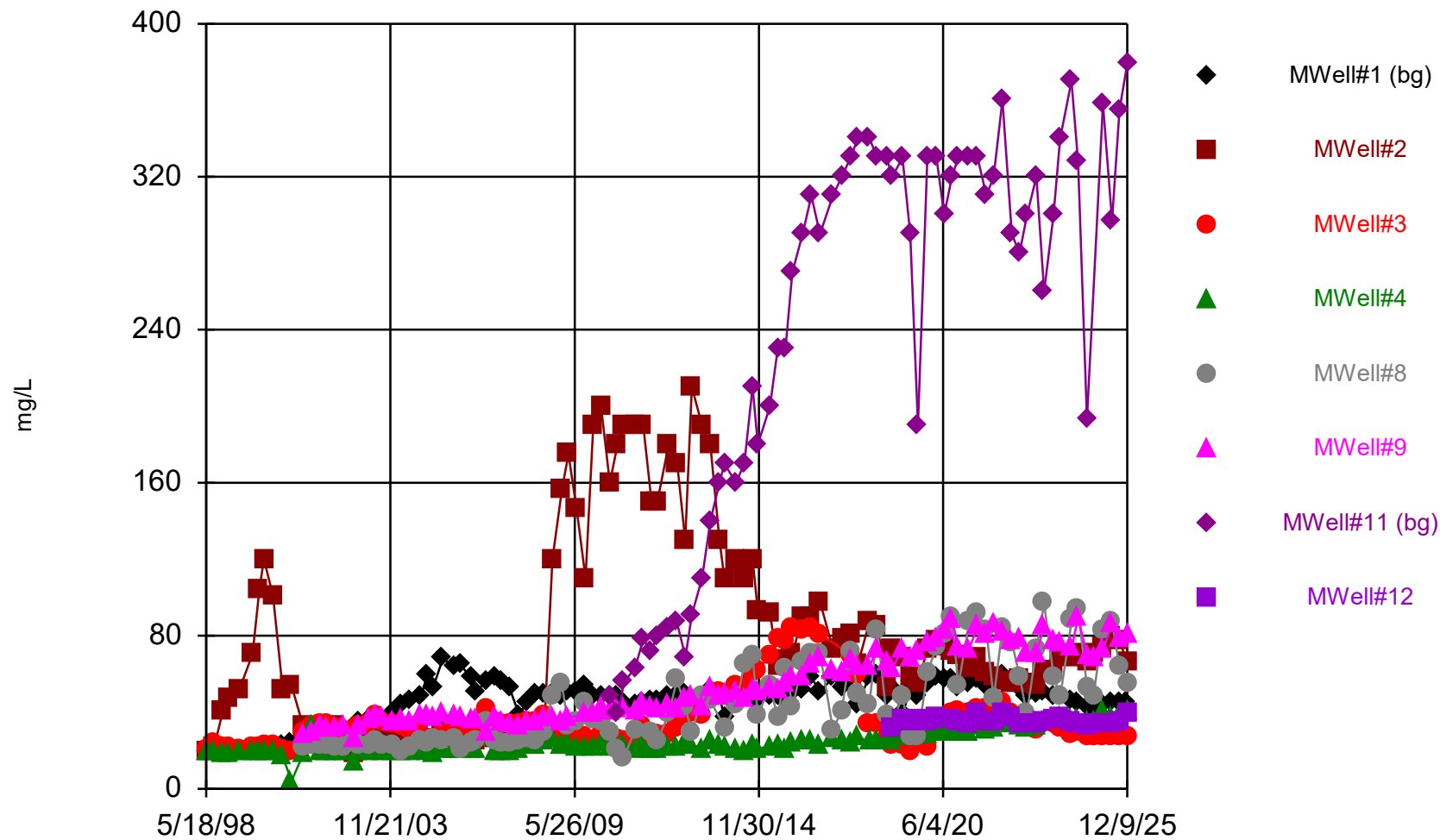
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Sodium, Dissolved Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

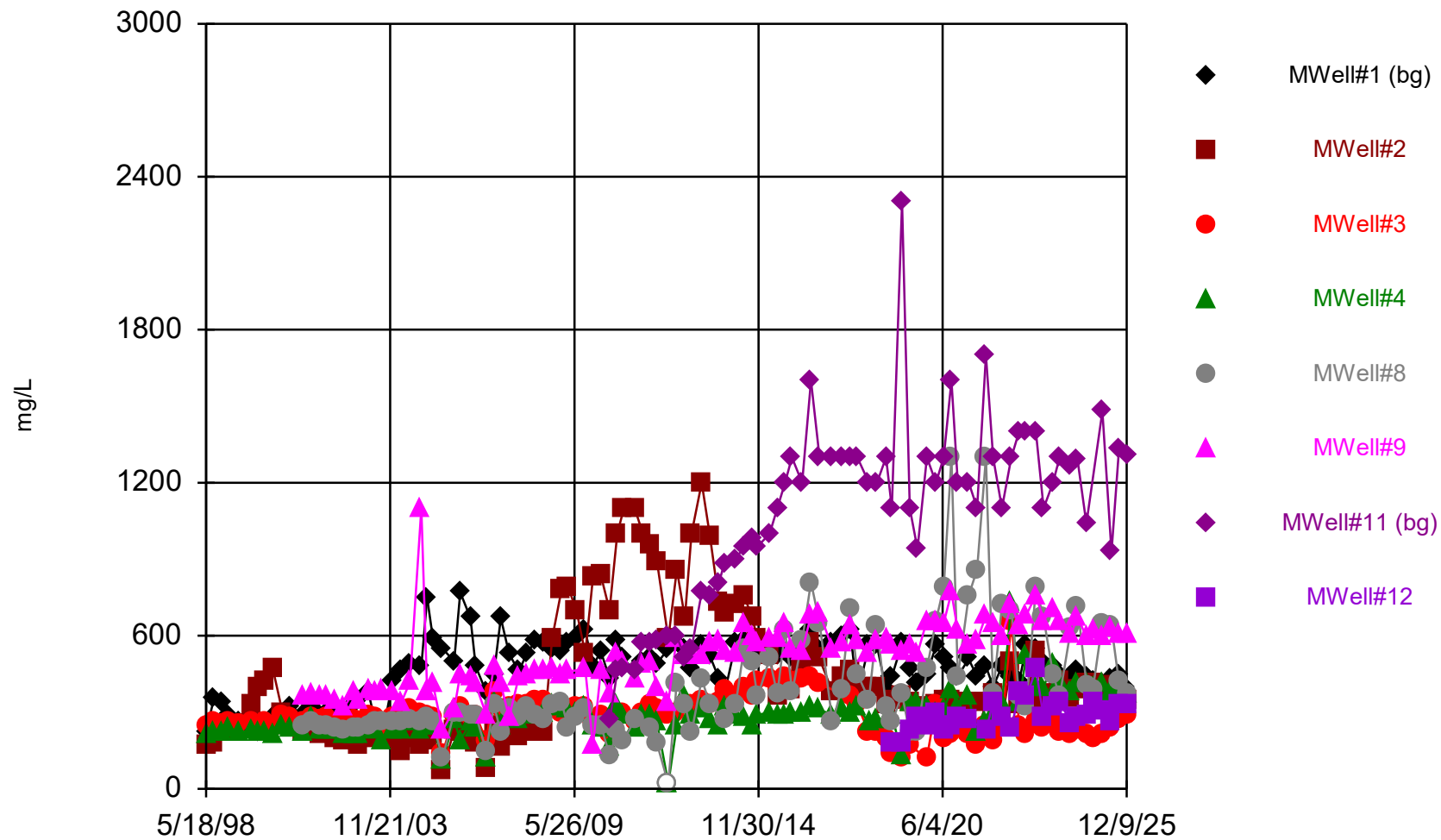
Time Series



Constituent: Sulfate Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

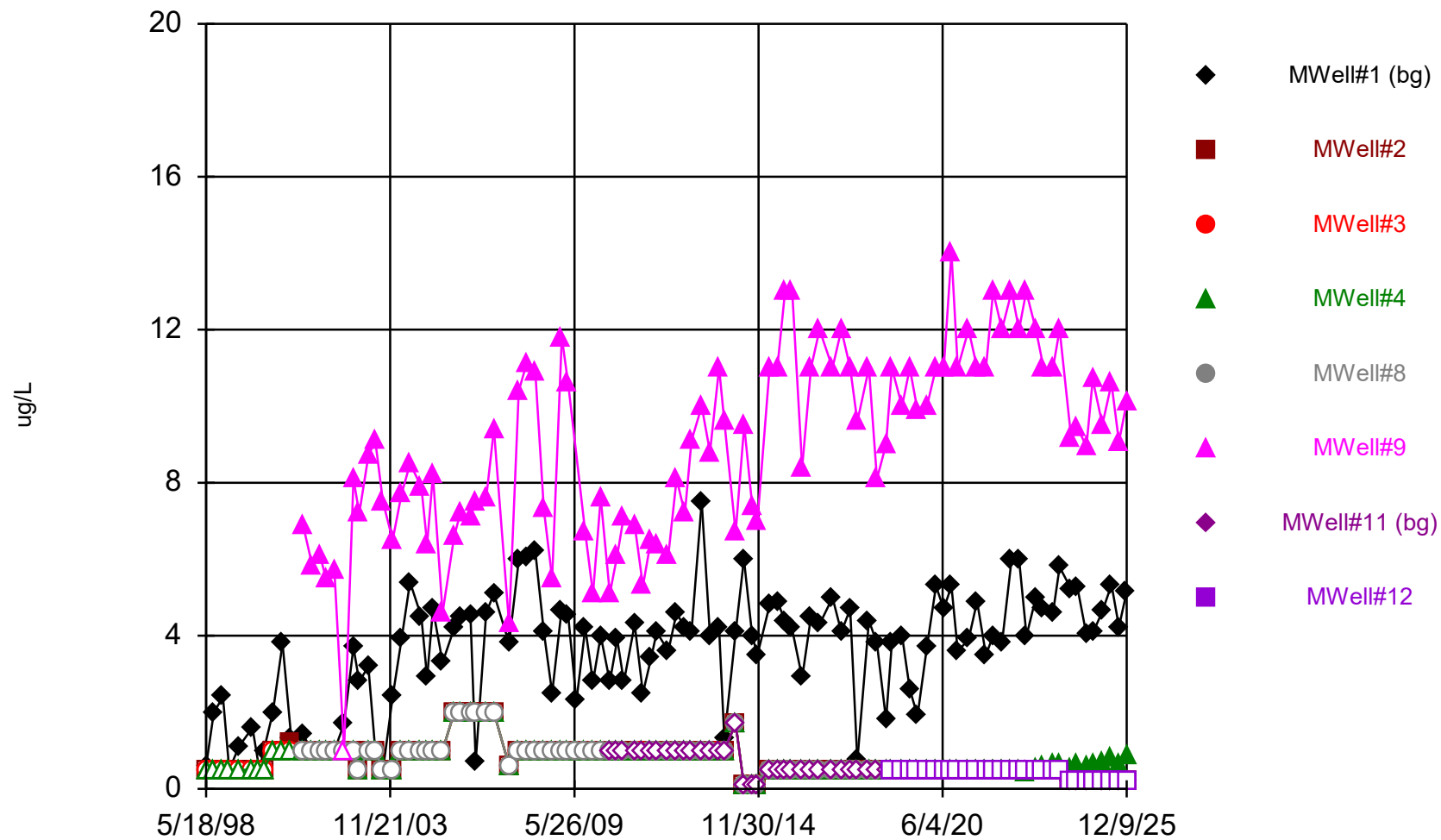
Time Series



Constituent: TDS Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1

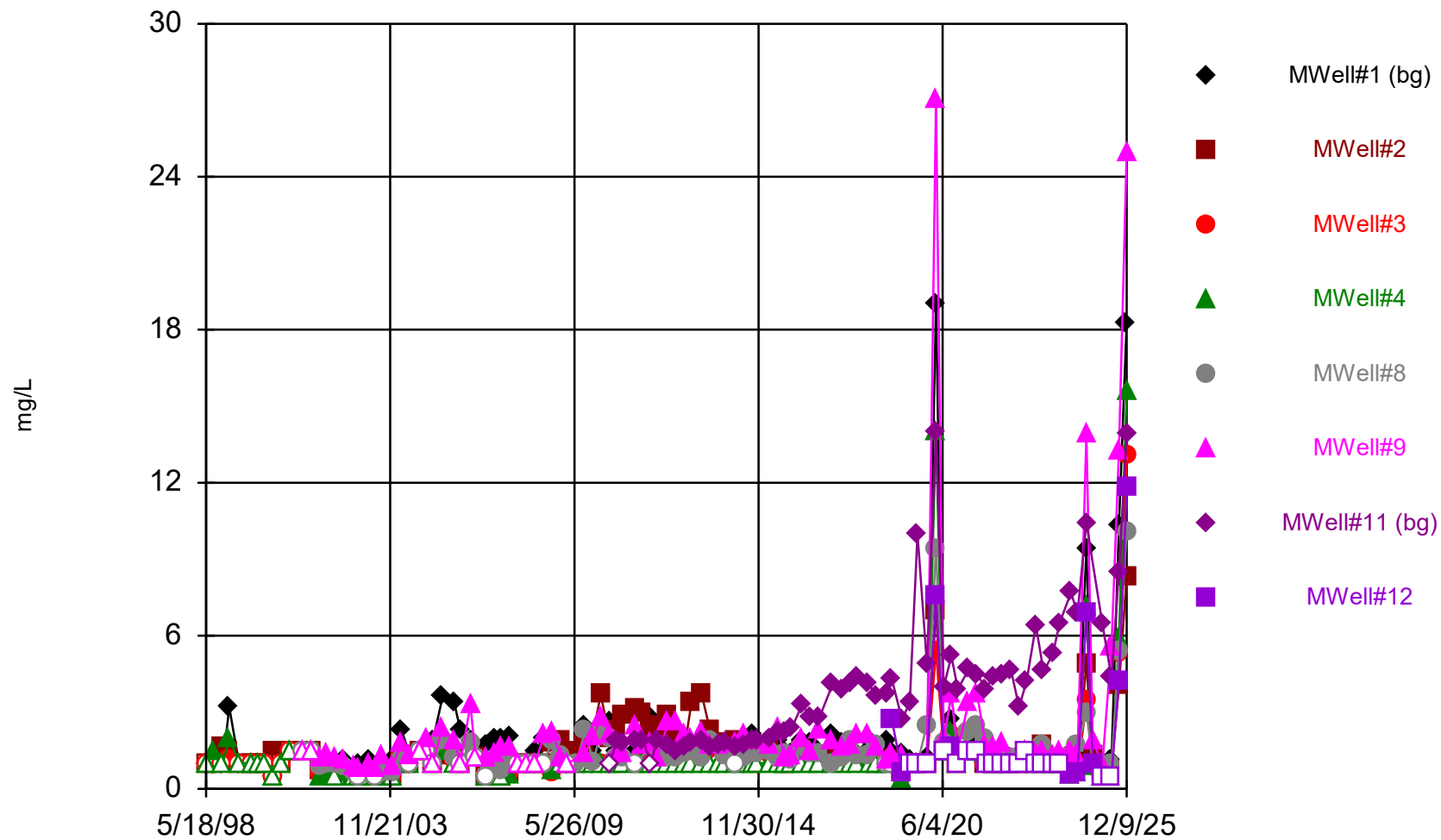
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Tetrachloroethene Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

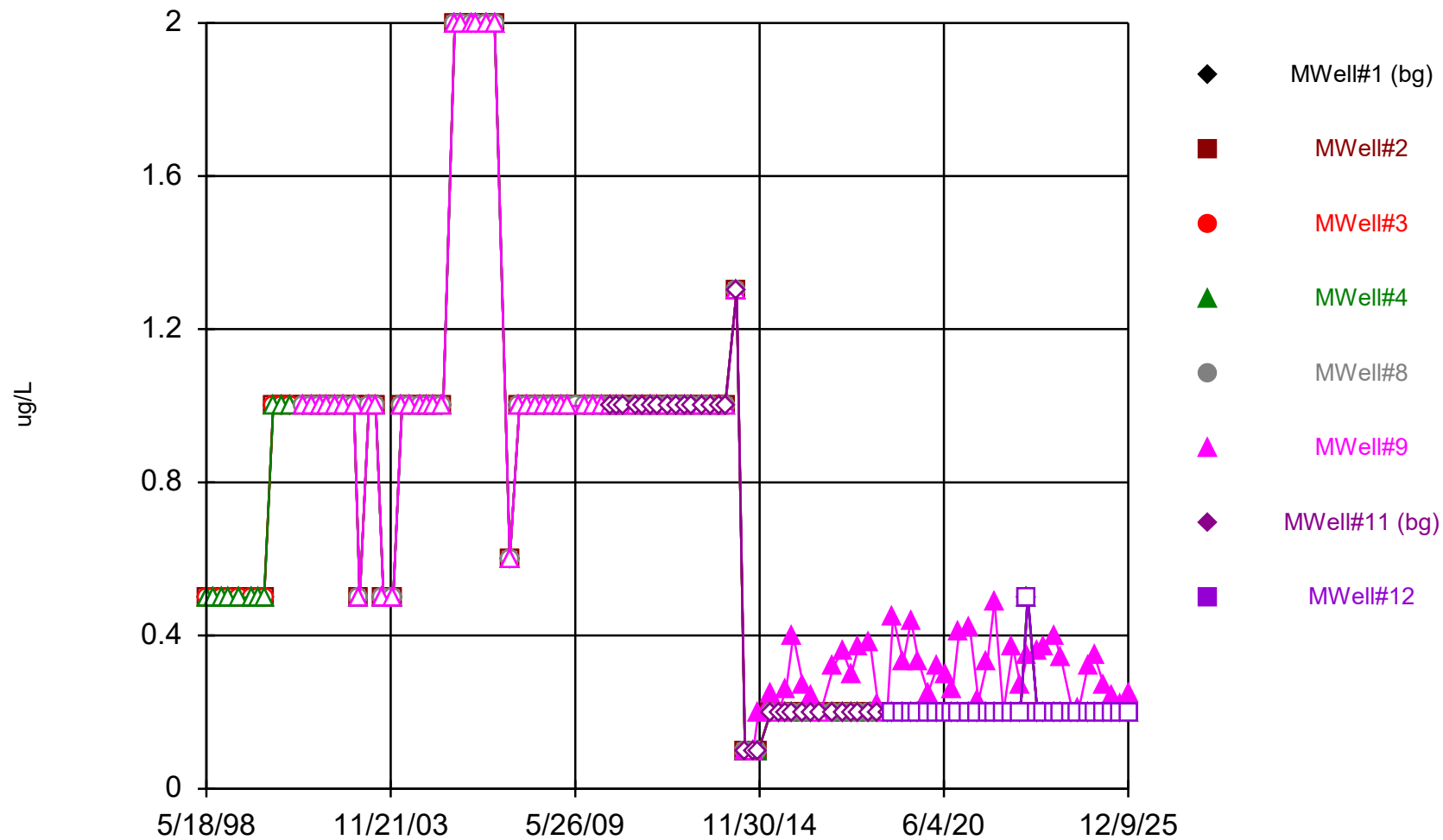
Time Series



Constituent: TOC Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1

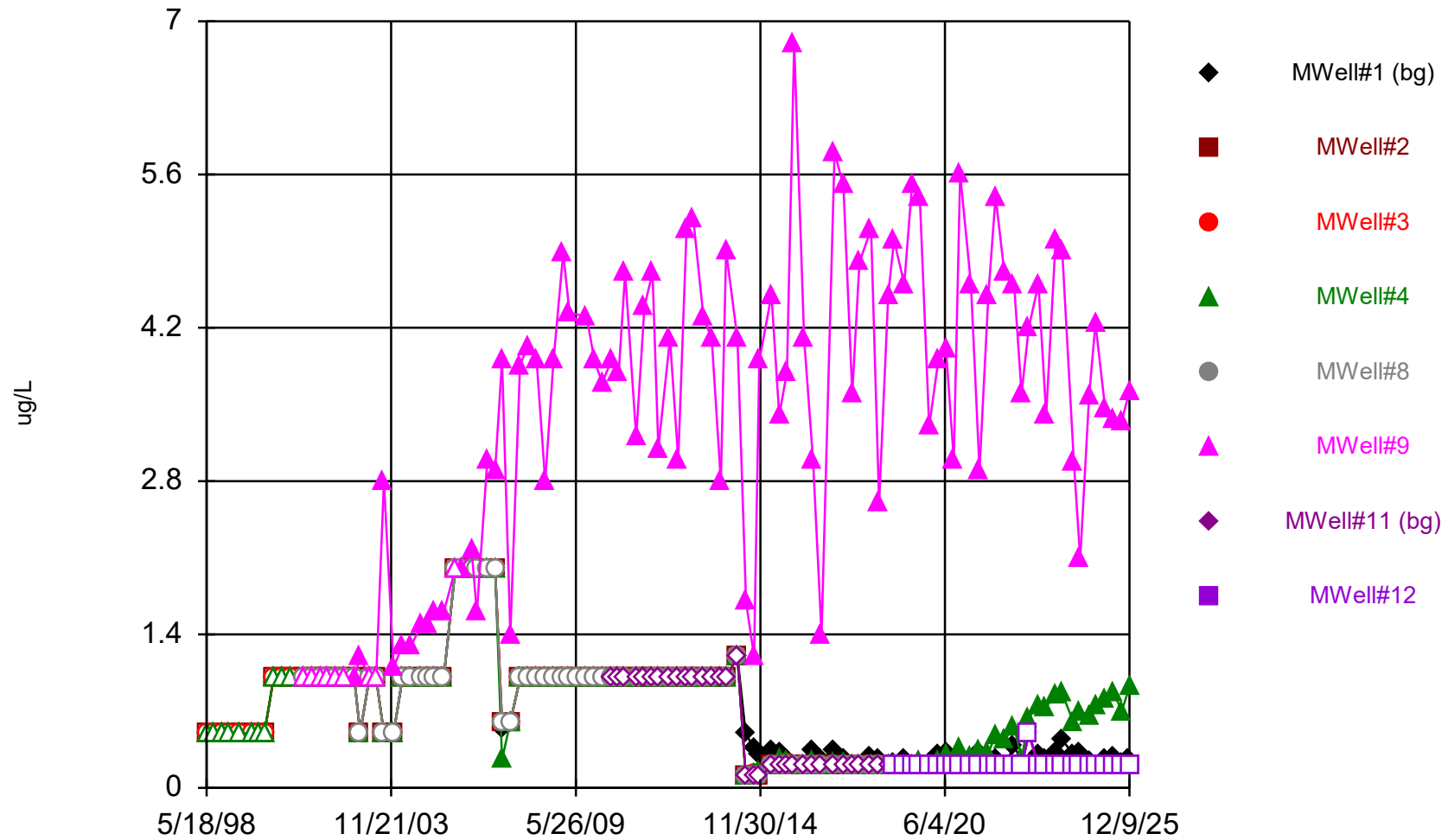
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



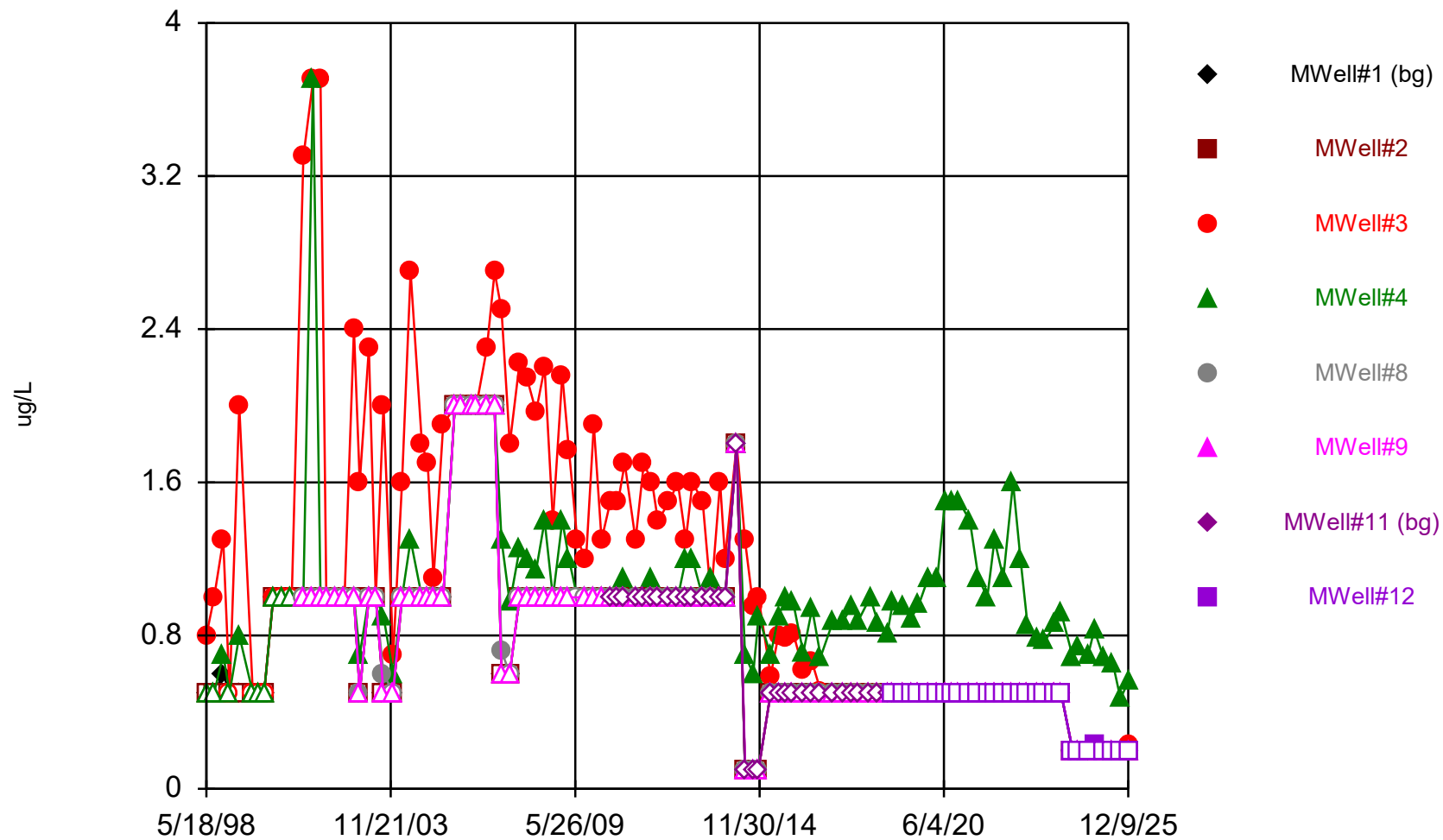
Constituent: trans-1,2-Dichloroethene Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



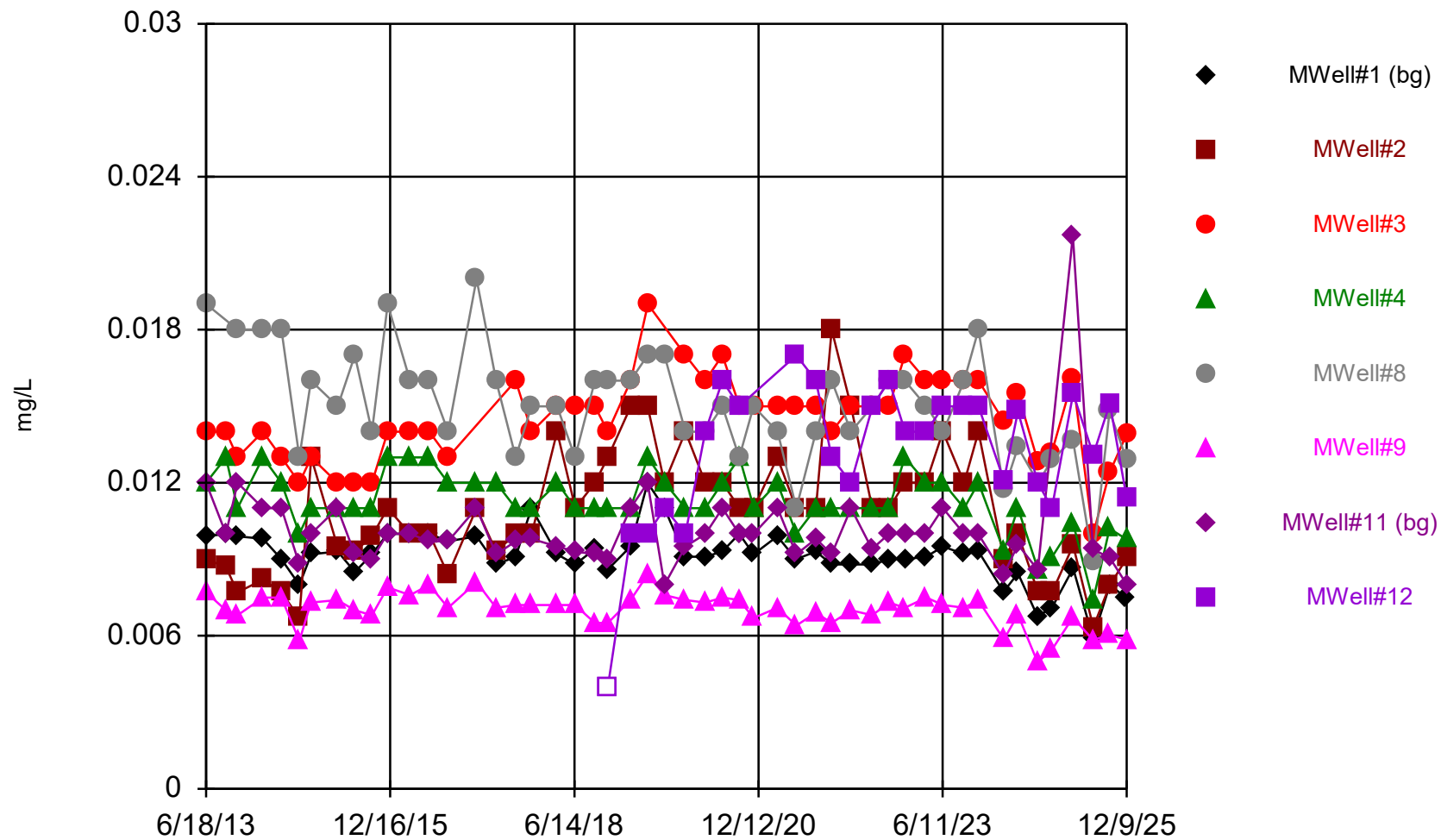
Constituent: Trichloroethene Analysis Run 2/13/2026 2:21 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



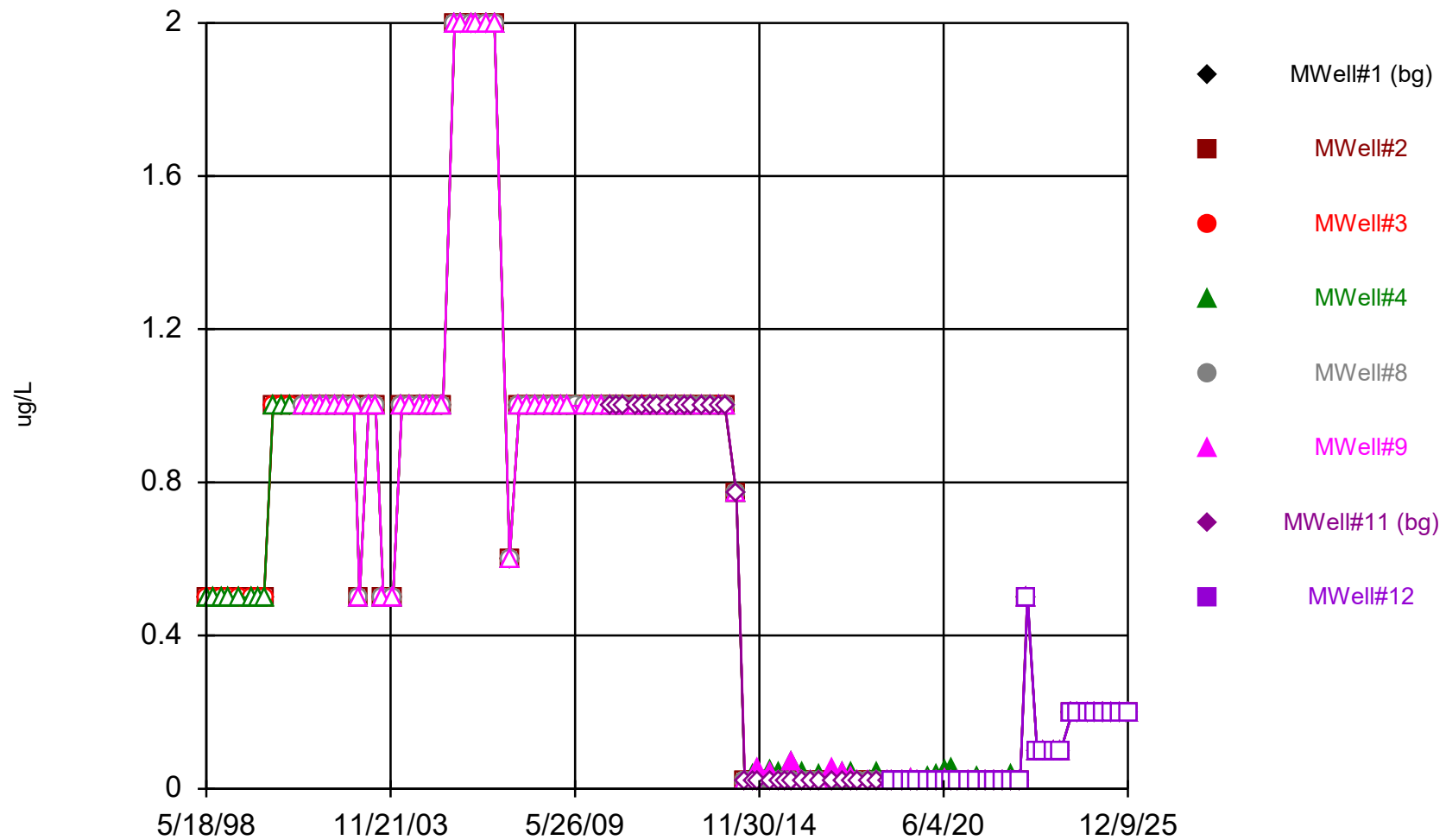
Constituent: Trichlorofluoromethane Analysis Run 2/13/2026 2:22 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



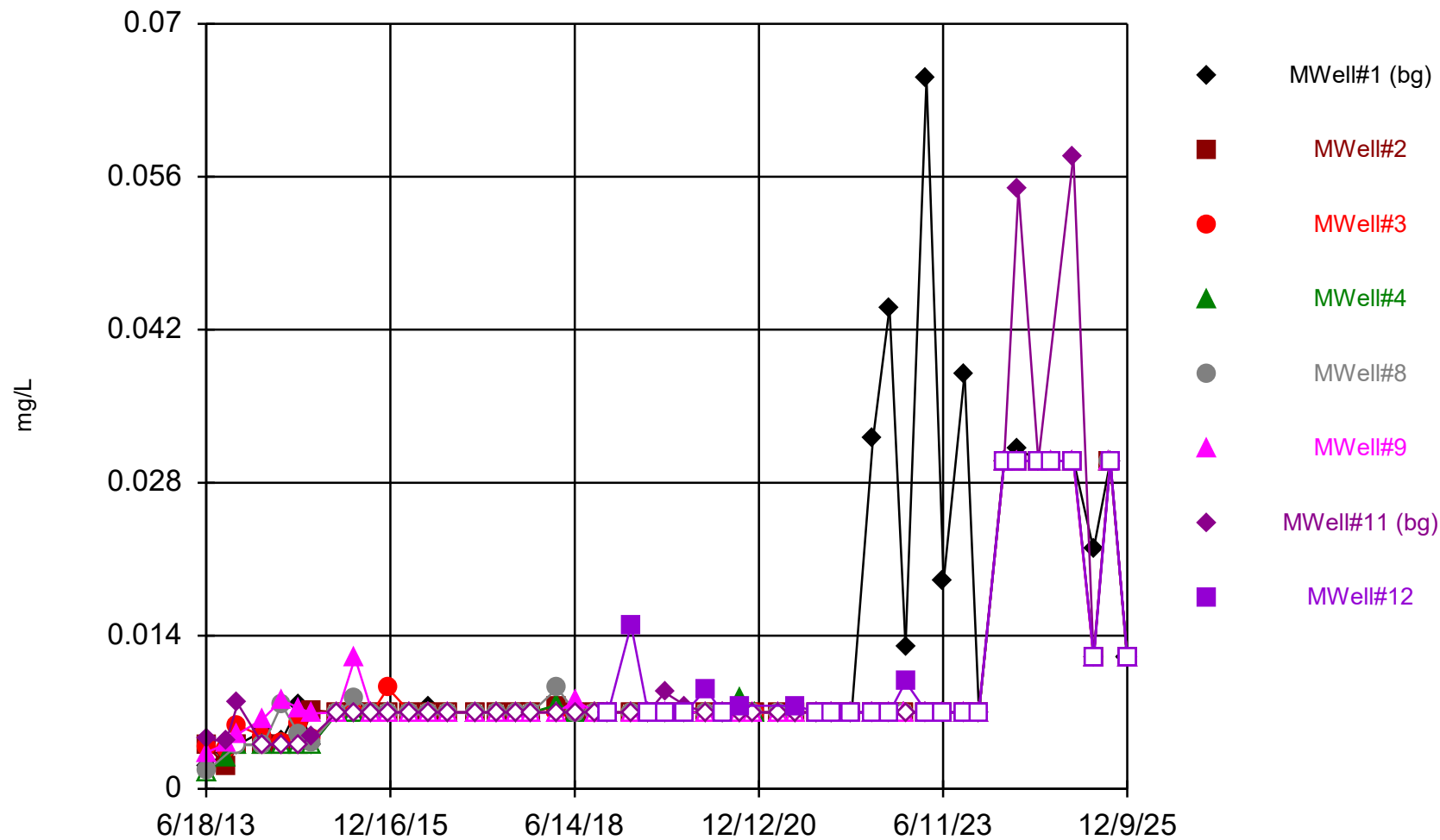
Constituent: Vanadium, Total Analysis Run 2/13/2026 2:22 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Vinyl Chloride Analysis Run 2/13/2026 2:22 PM View: HRLF_TSP Set1
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

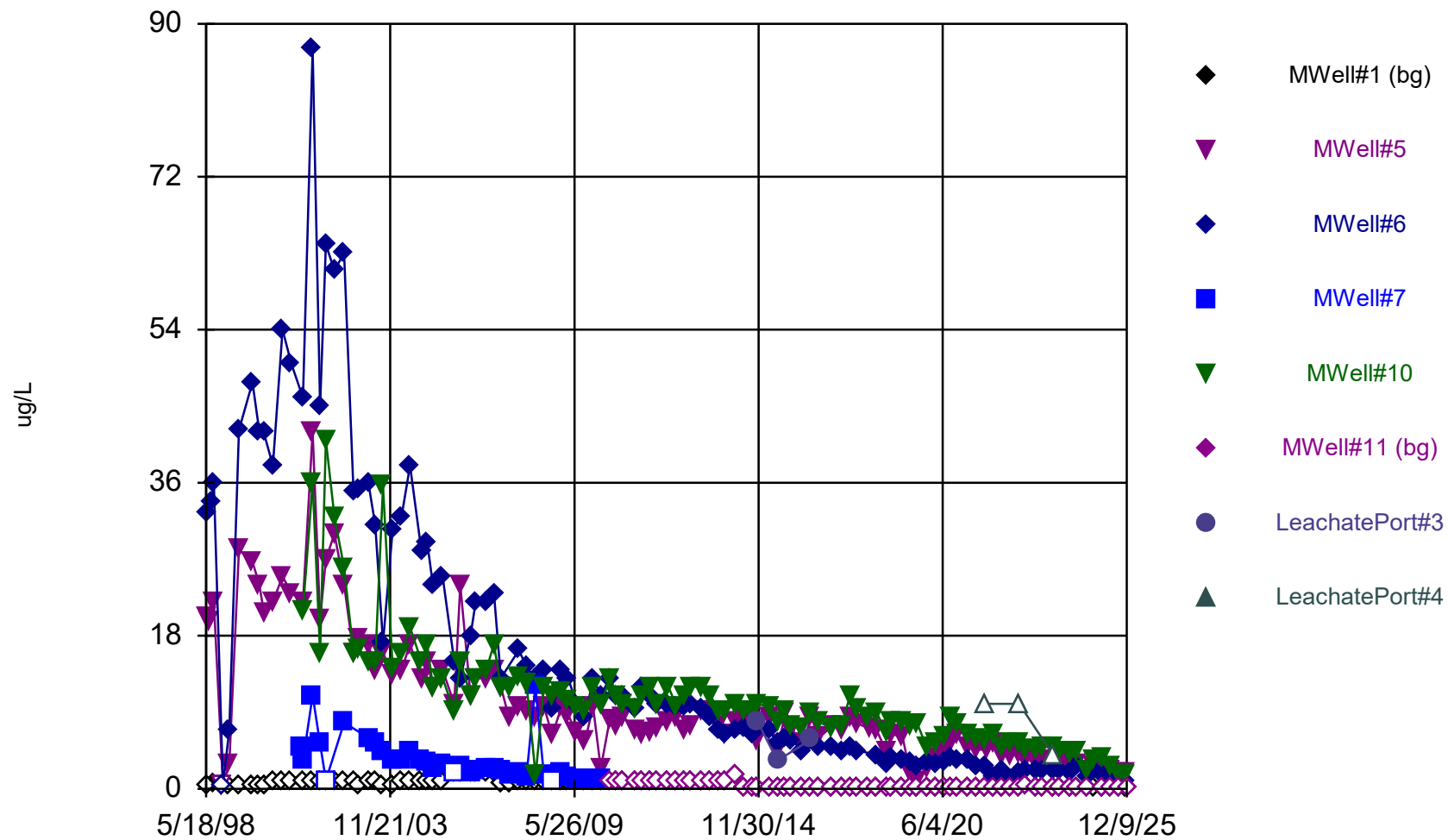
Time Series



Constituent: Zinc, Total Analysis Run 2/13/2026 2:22 PM View: HRLF_TSP Set1

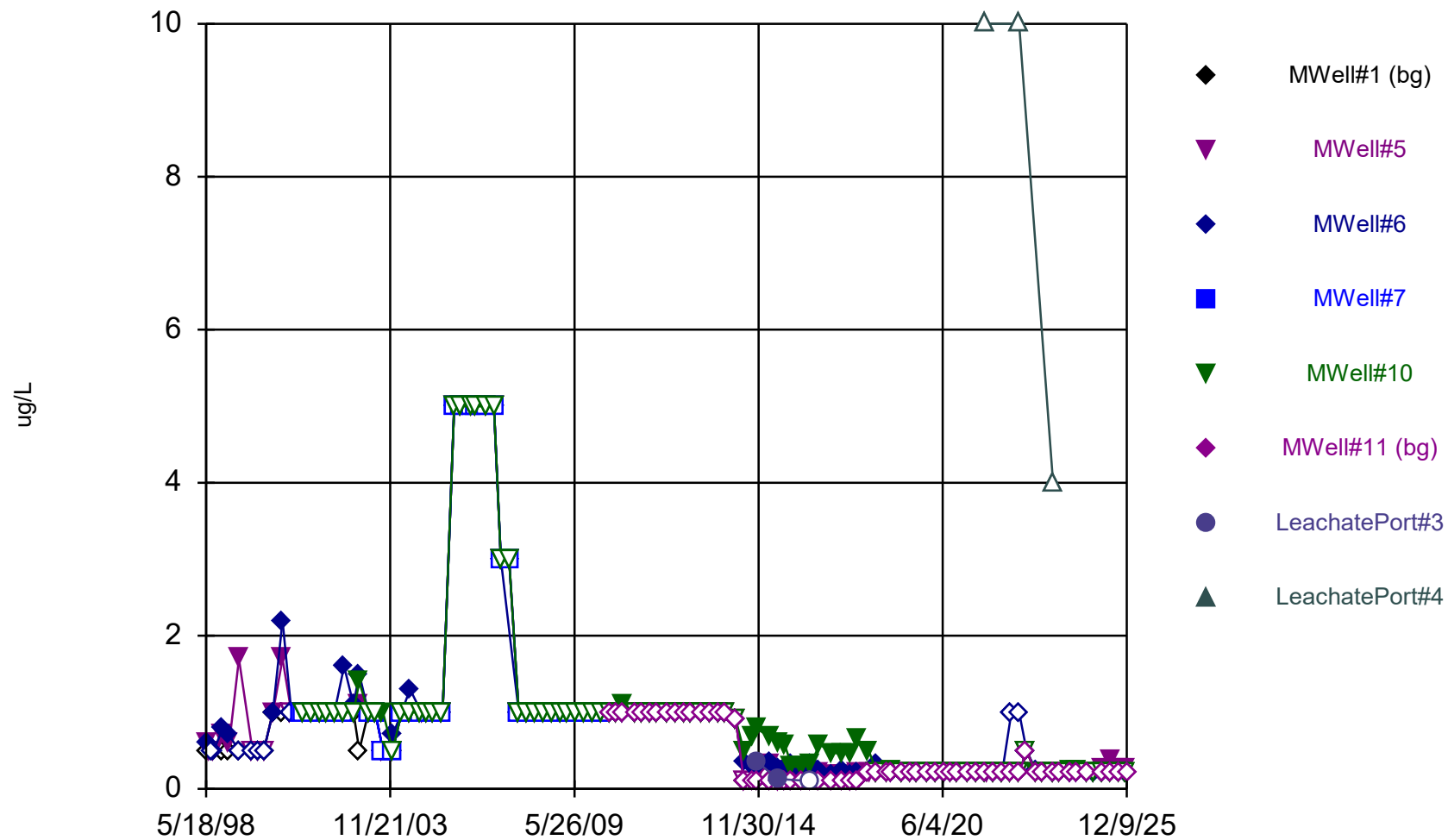
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



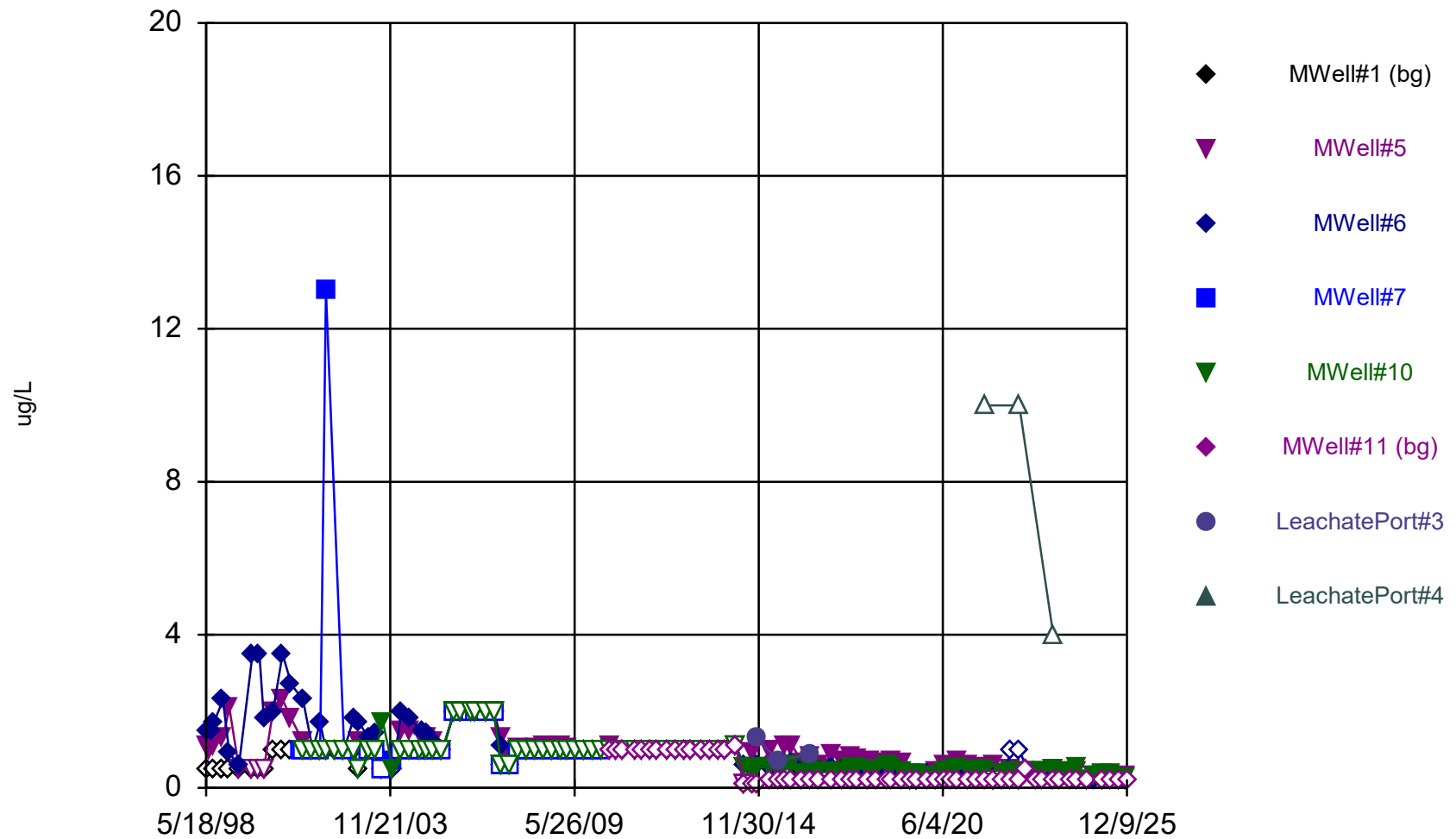
Constituent: 1,1-Dichloroethane Analysis Run 3/17/2026 4:28 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



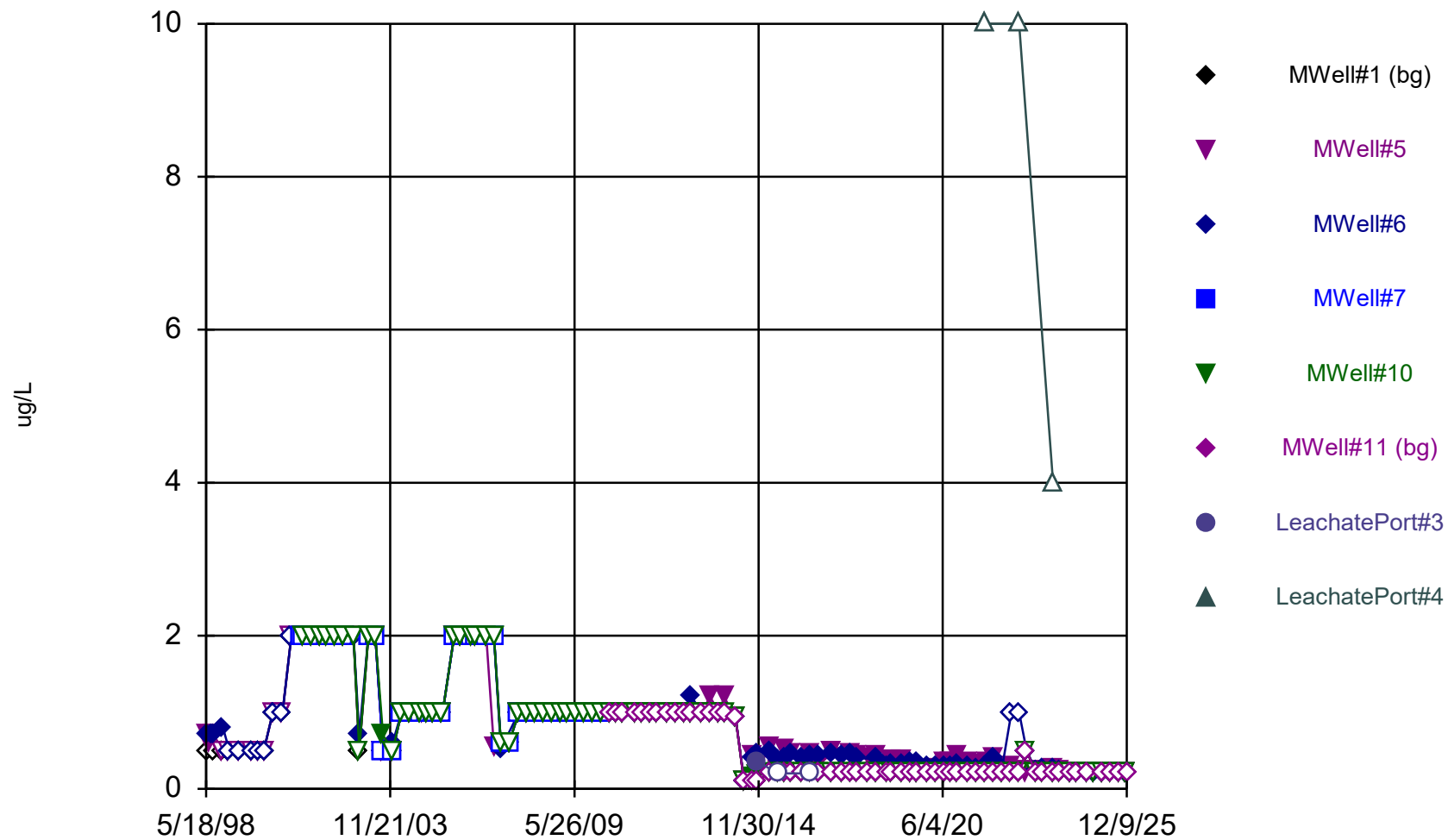
Constituent: 1,1-Dichloroethene Analysis Run 3/17/2026 4:28 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



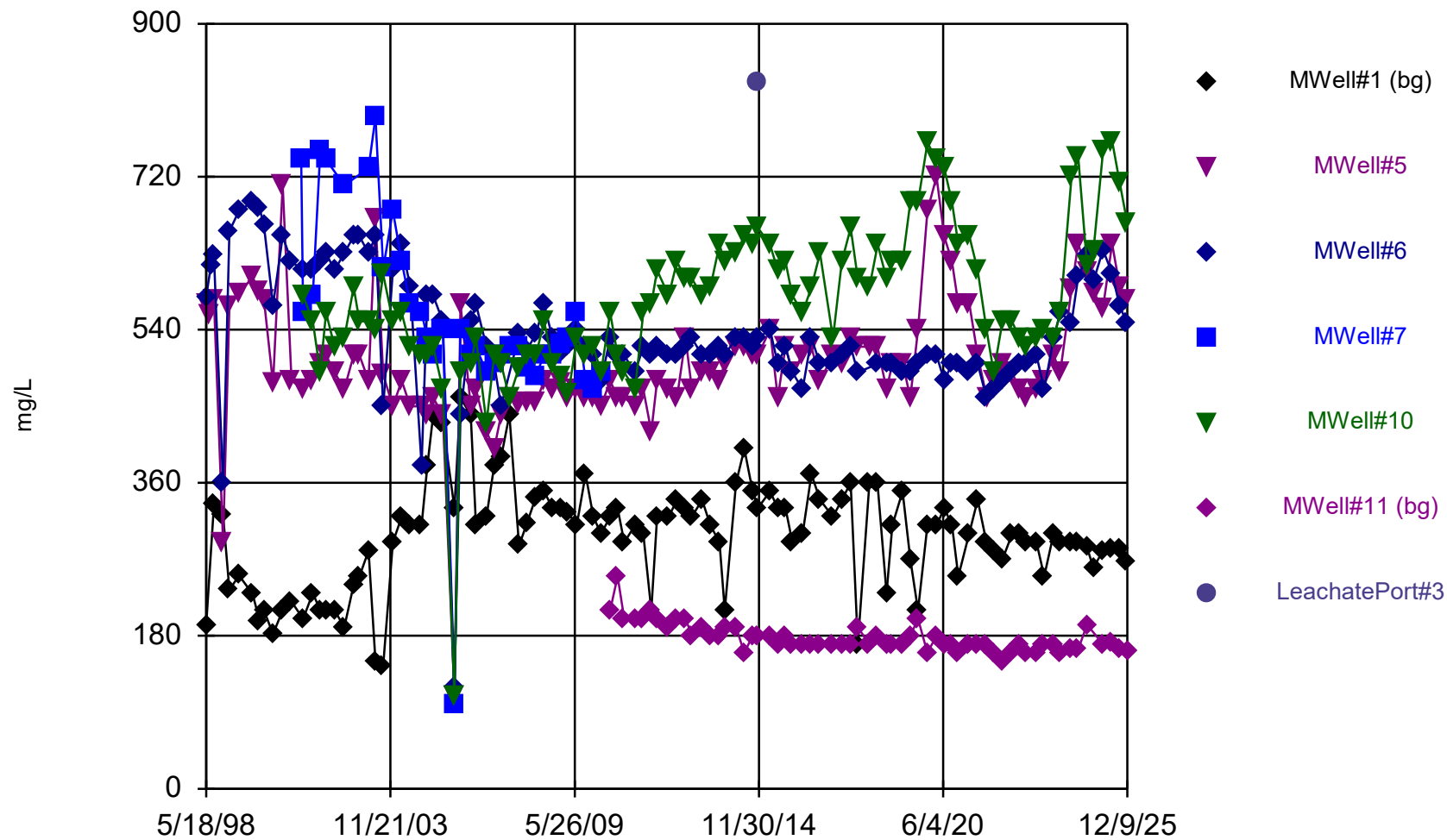
Constituent: 1,2-Dichloroethane Analysis Run 3/17/2026 4:28 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



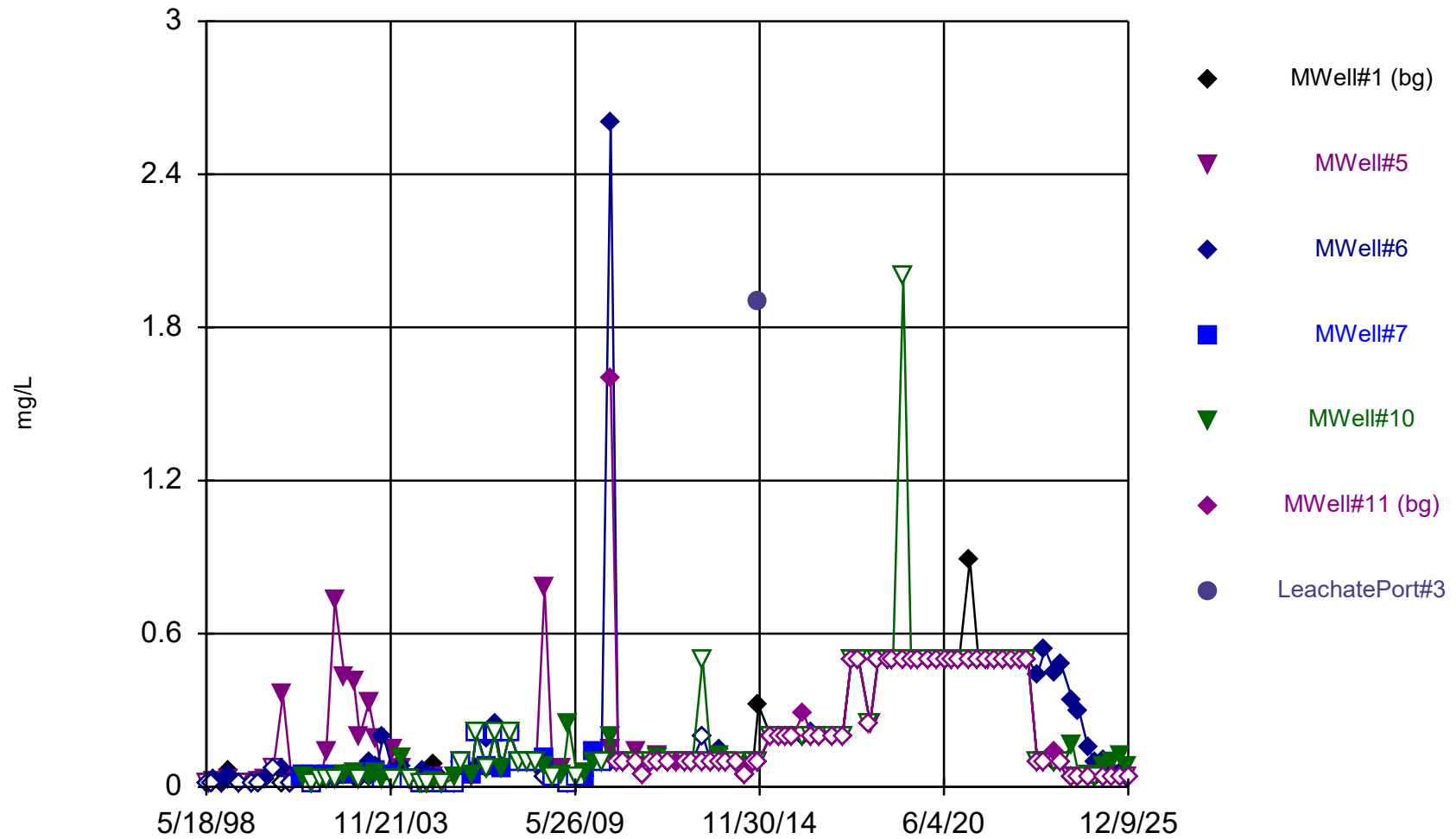
Constituent: 1,2-Dichloropropane Analysis Run 3/17/2026 4:28 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



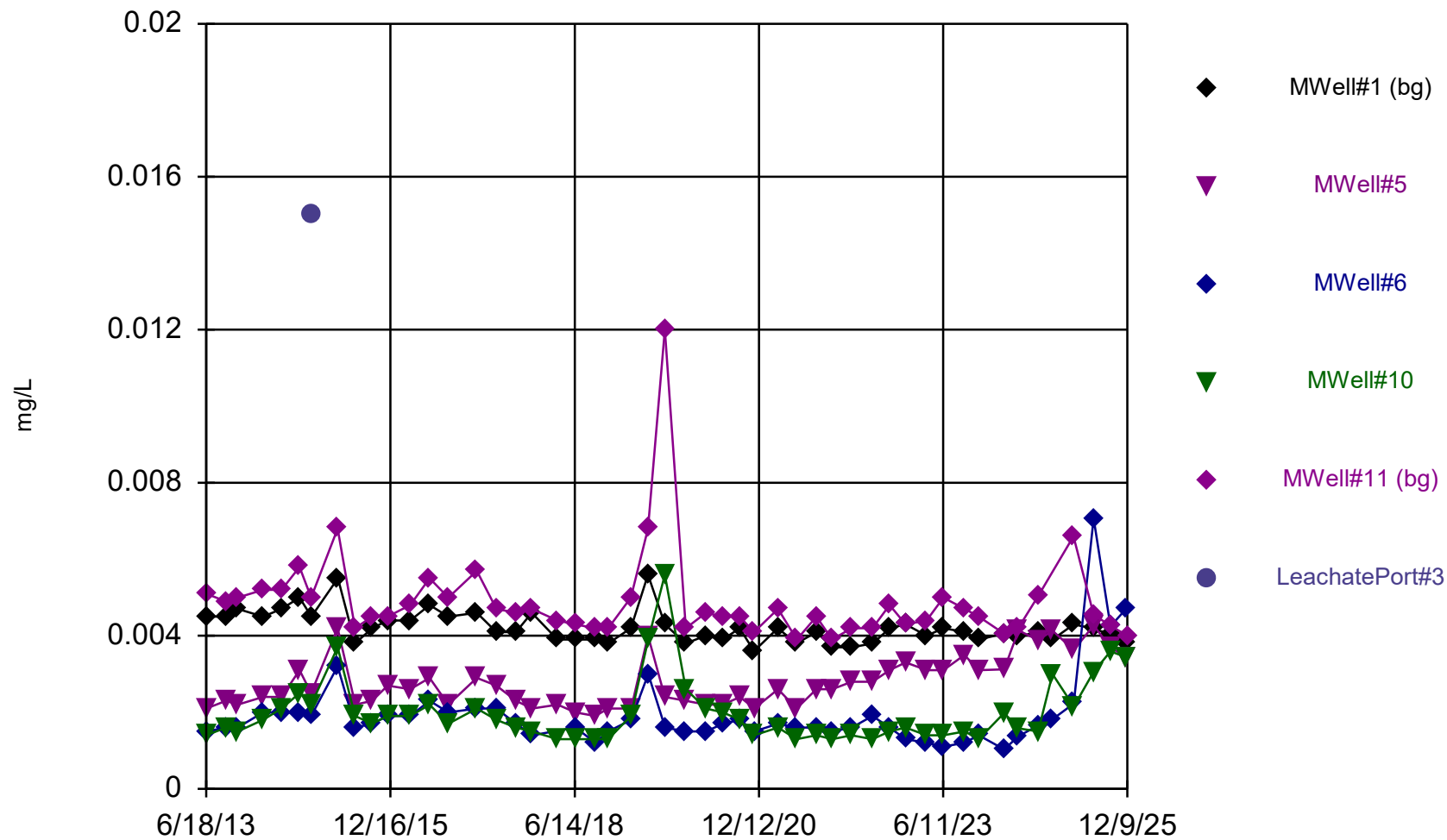
Constituent: Alkalinity, Bicarbonate Analysis Run 3/17/2026 4:28 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



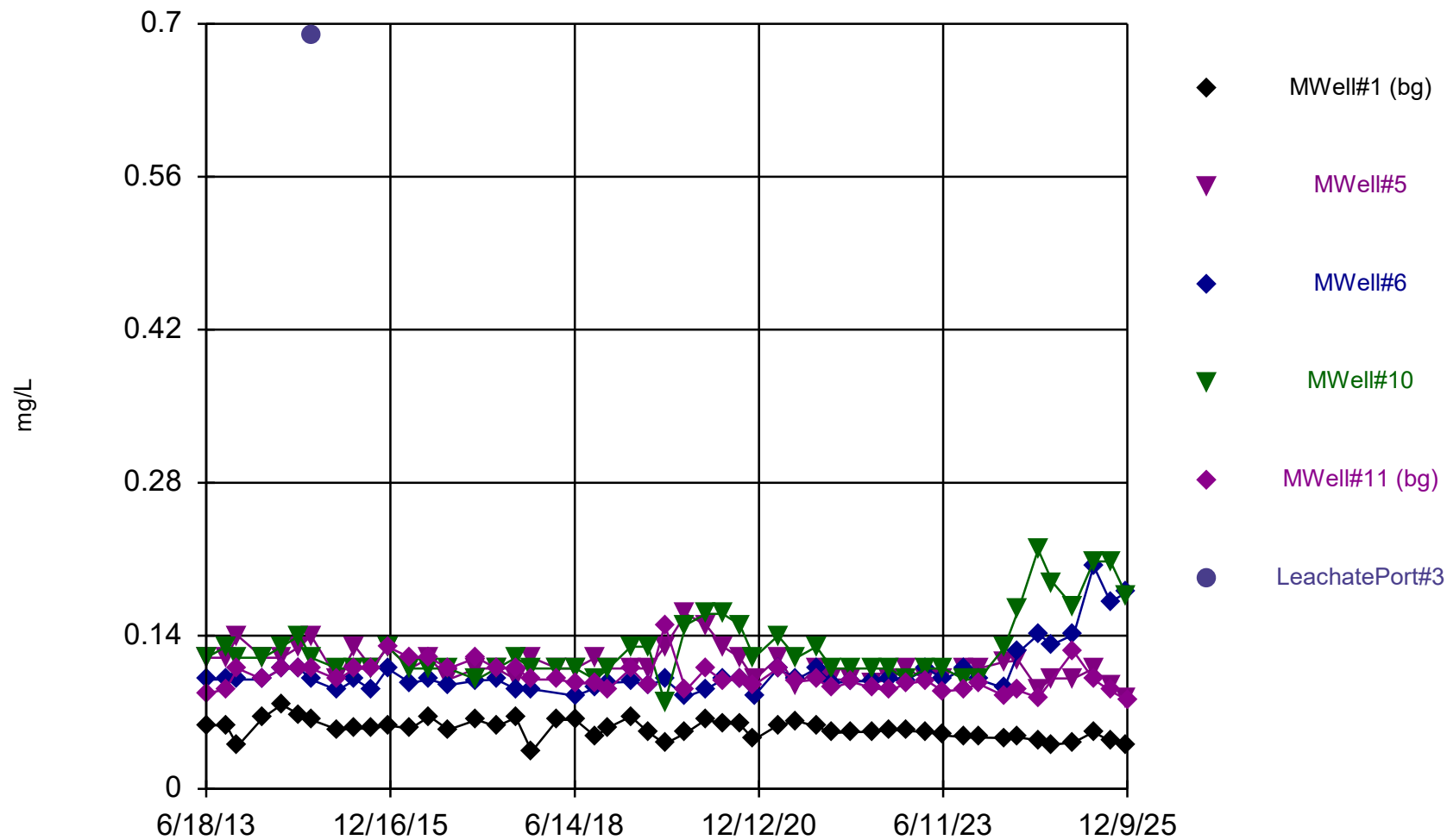
Constituent: Ammonia Nitrogen Analysis Run 3/17/2026 4:28 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



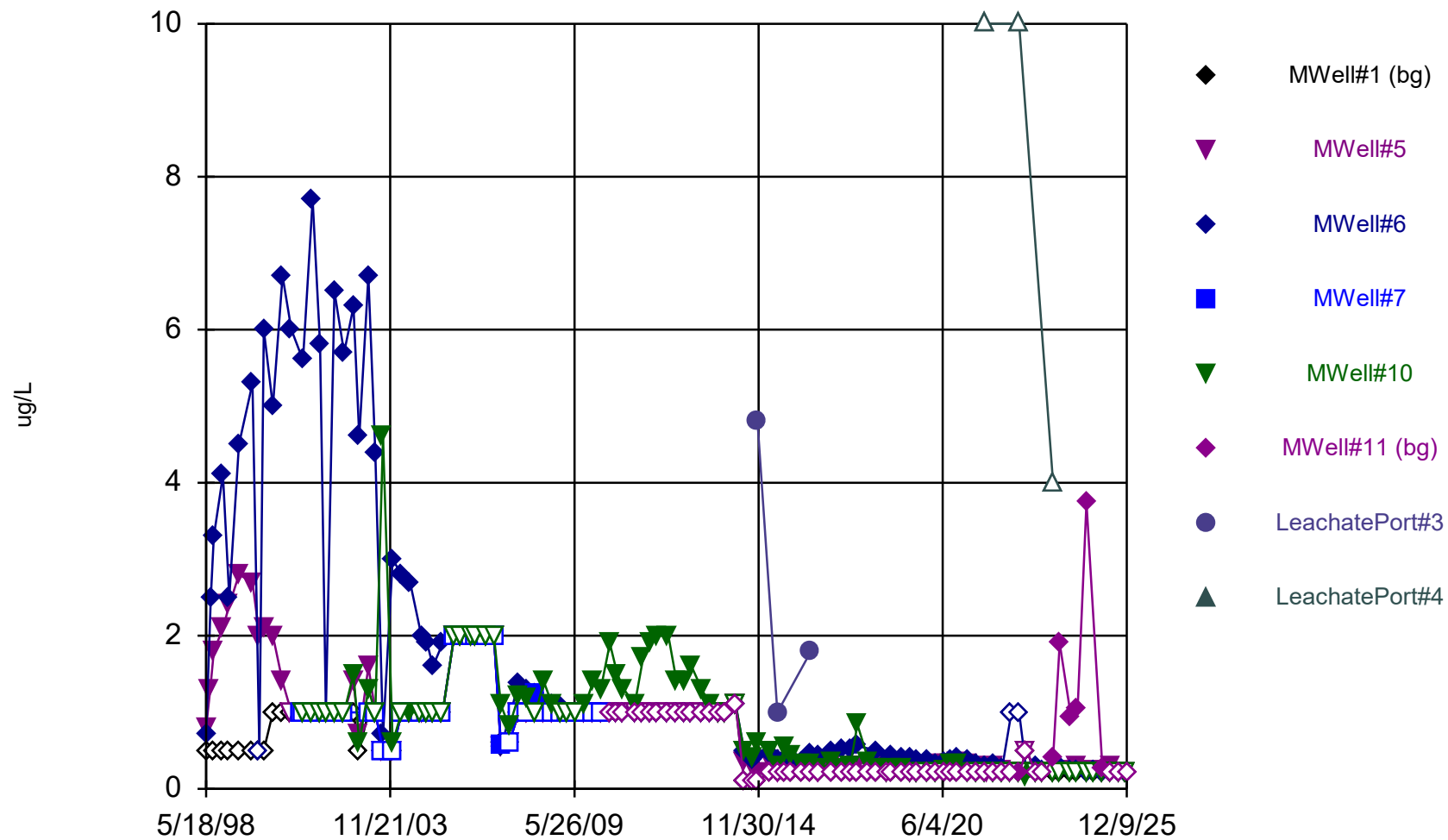
Constituent: Arsenic, Total Analysis Run 3/17/2026 4:28 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Barium, Total Analysis Run 3/17/2026 4:28 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

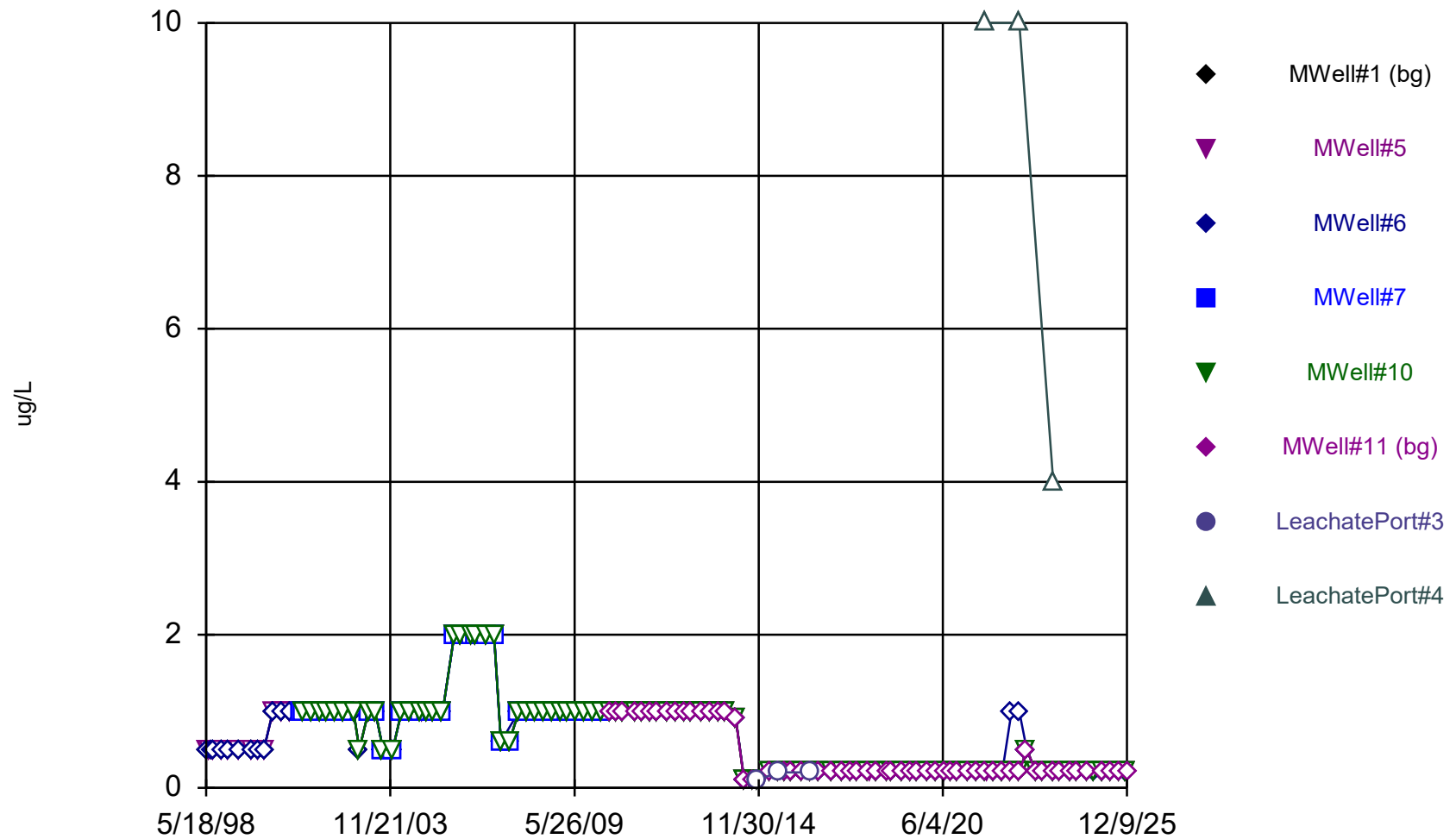
Time Series



Constituent: Benzene Analysis Run 3/17/2026 4:28 PM View: HRLF_TSP Set2

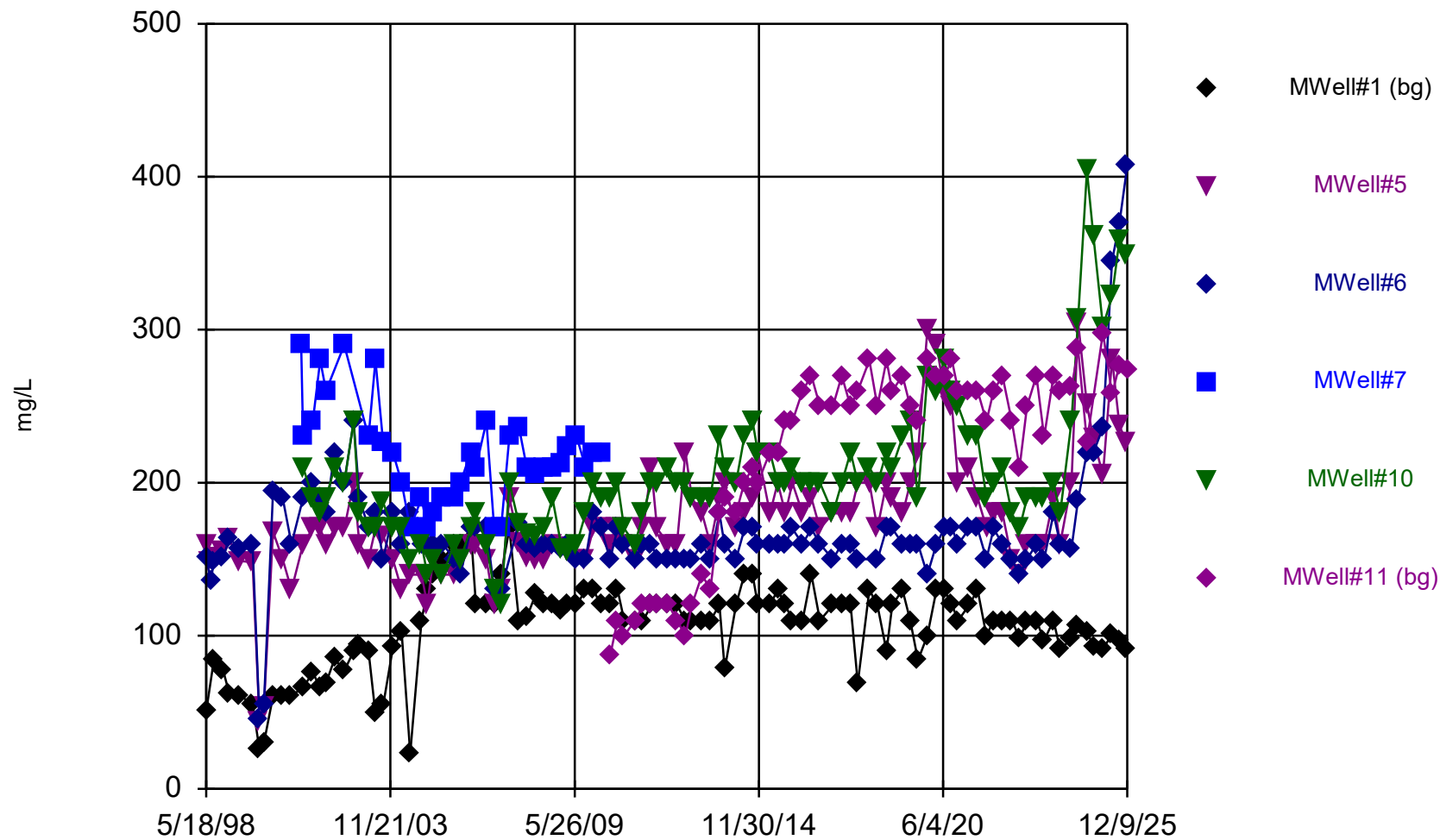
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



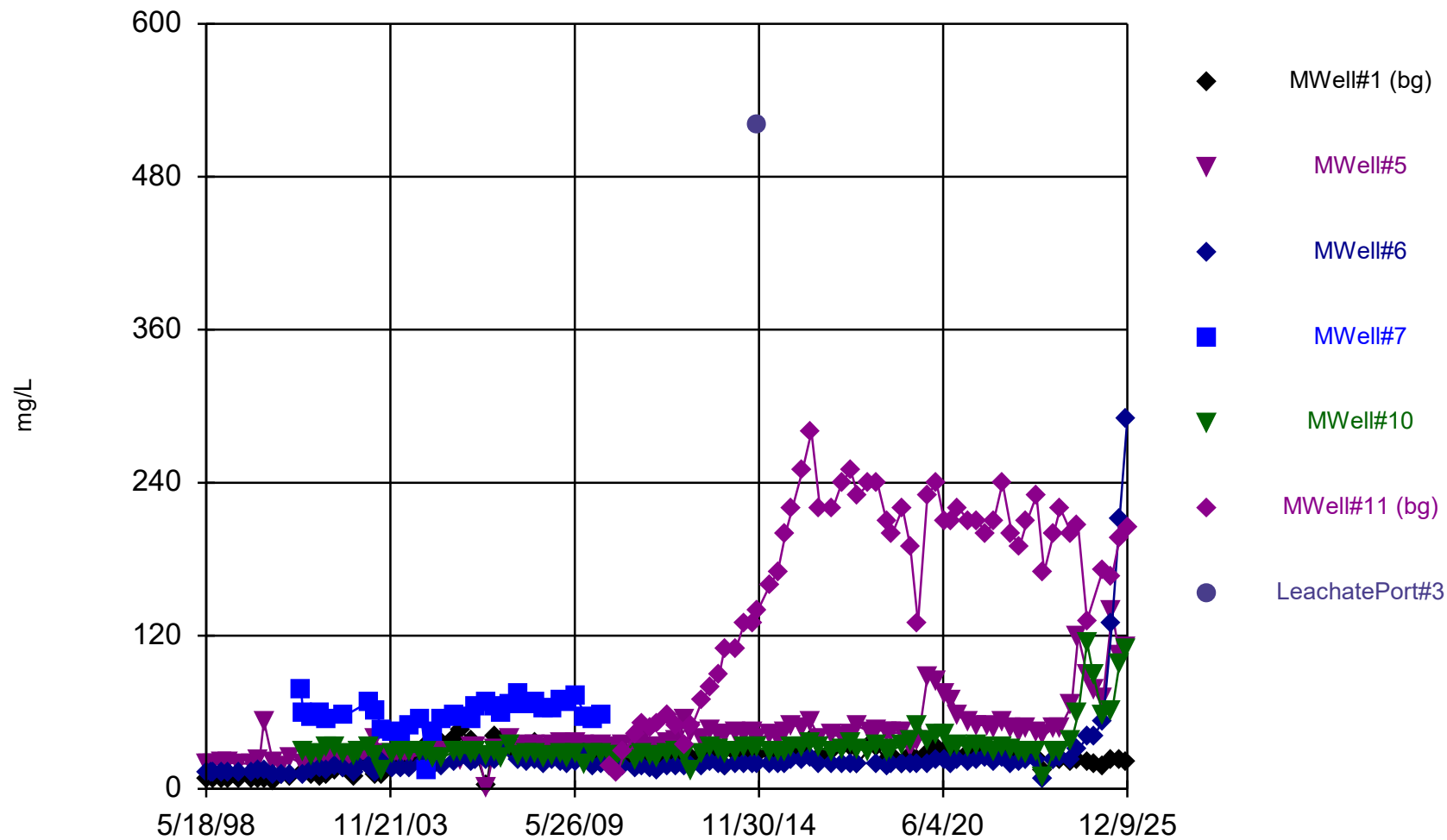
Constituent: Bromodichloromethane Analysis Run 3/17/2026 4:28 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Calcium, Dissolved Analysis Run 3/17/2026 4:28 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

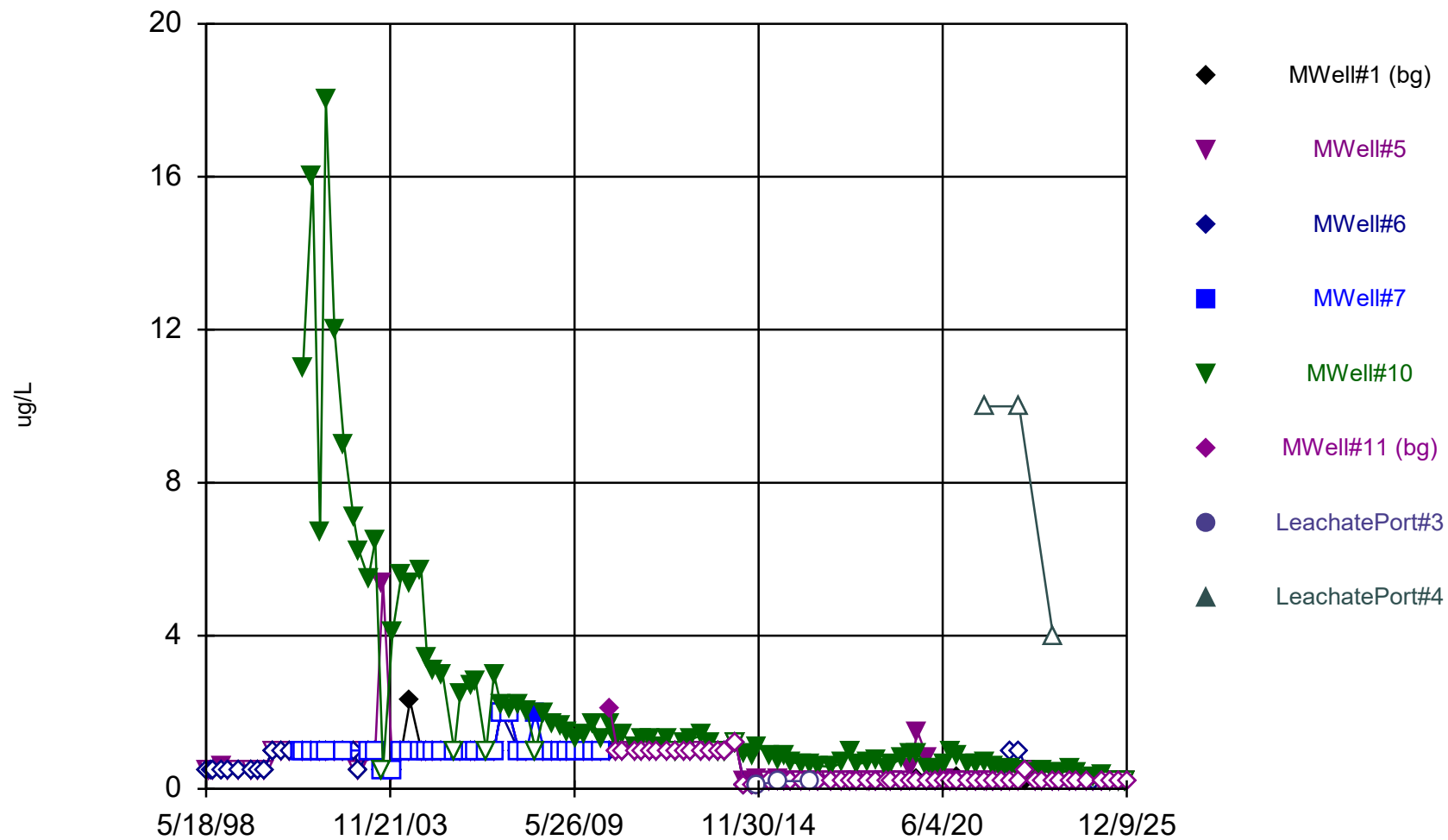
Time Series



Constituent: Chloride Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

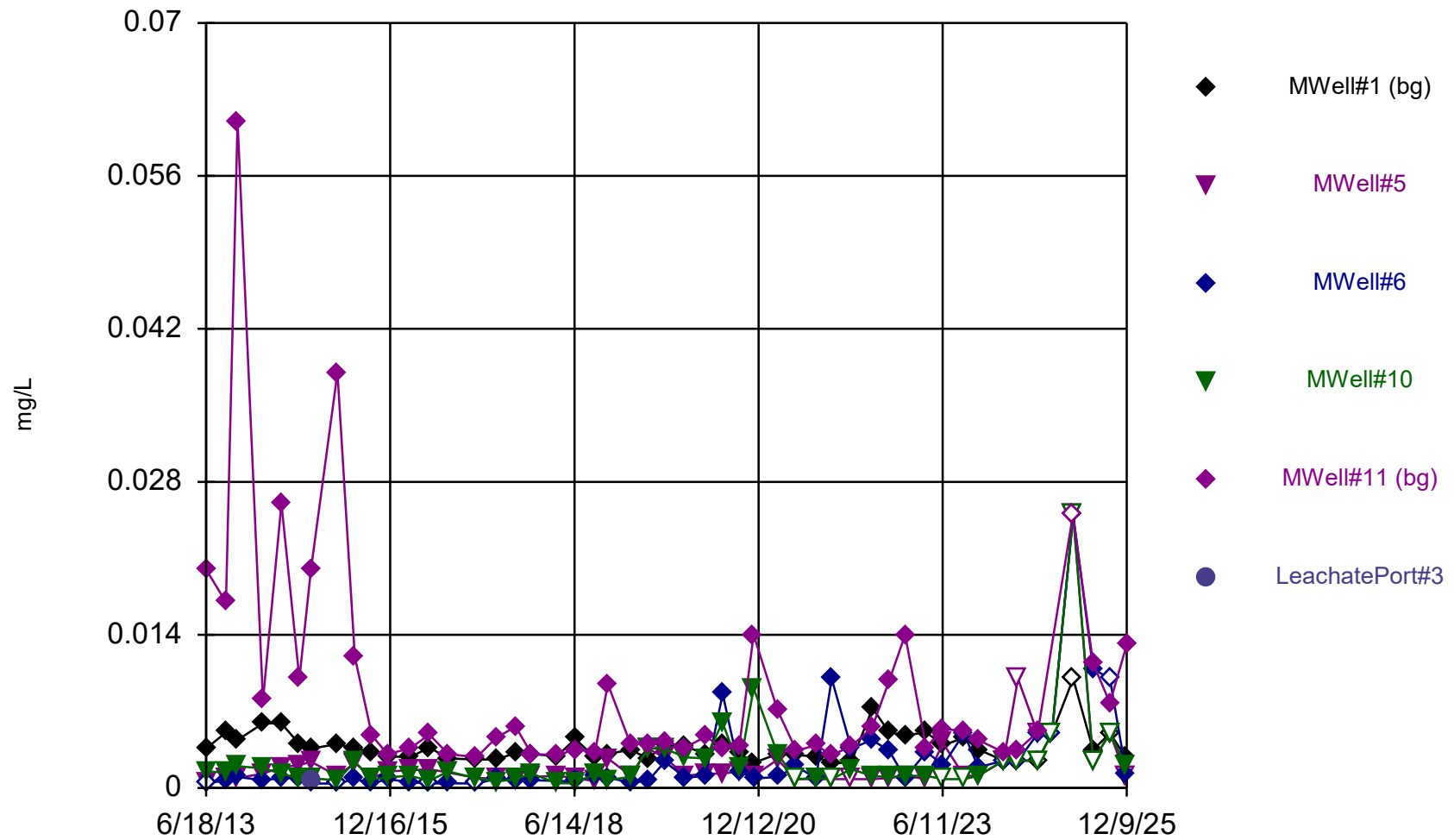
Time Series



Constituent: Chloroform Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2

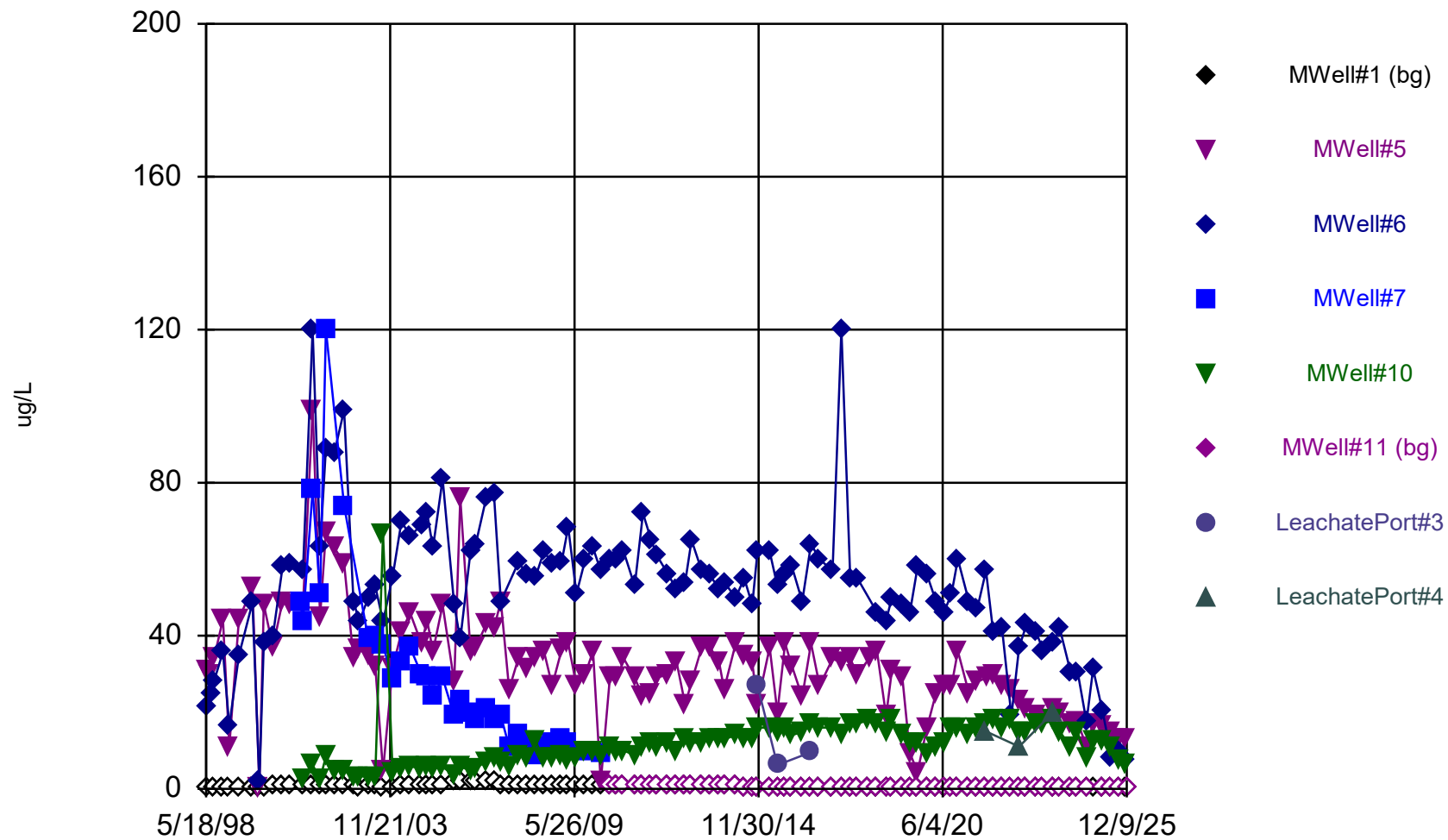
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



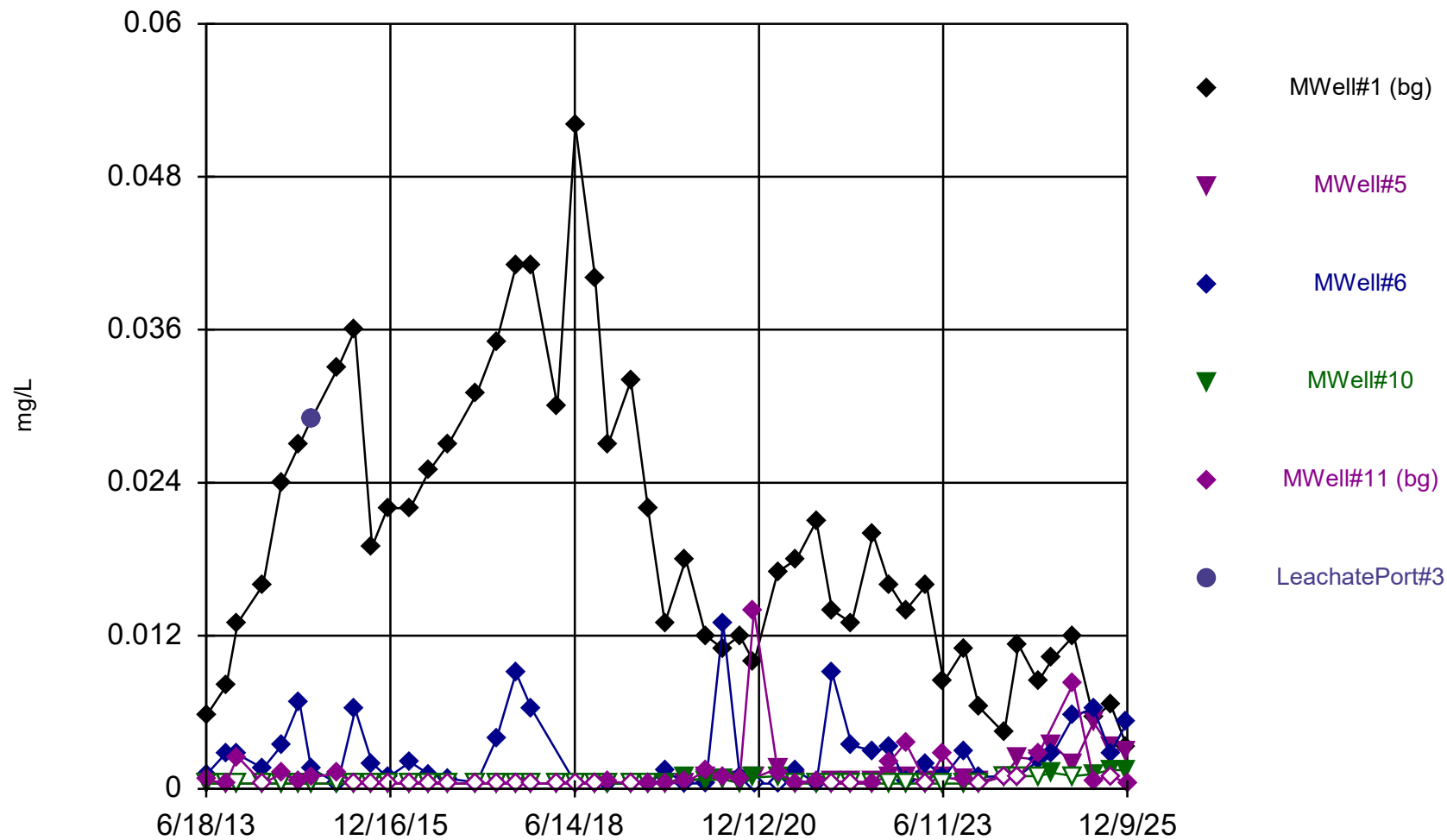
Constituent: Chromium, Total Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



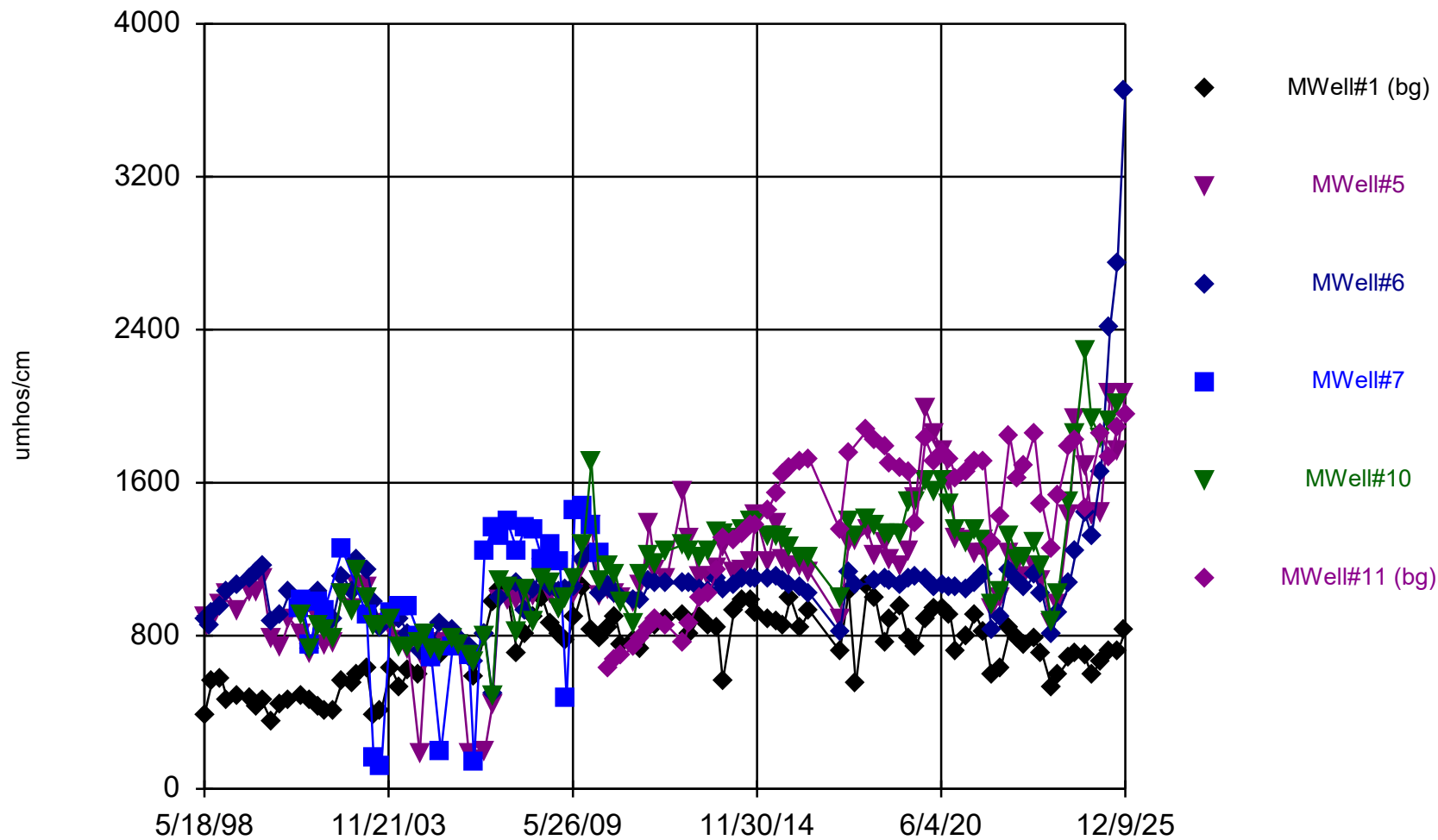
Constituent: cis-1,2-Dichloroethene Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Cobalt, Total Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

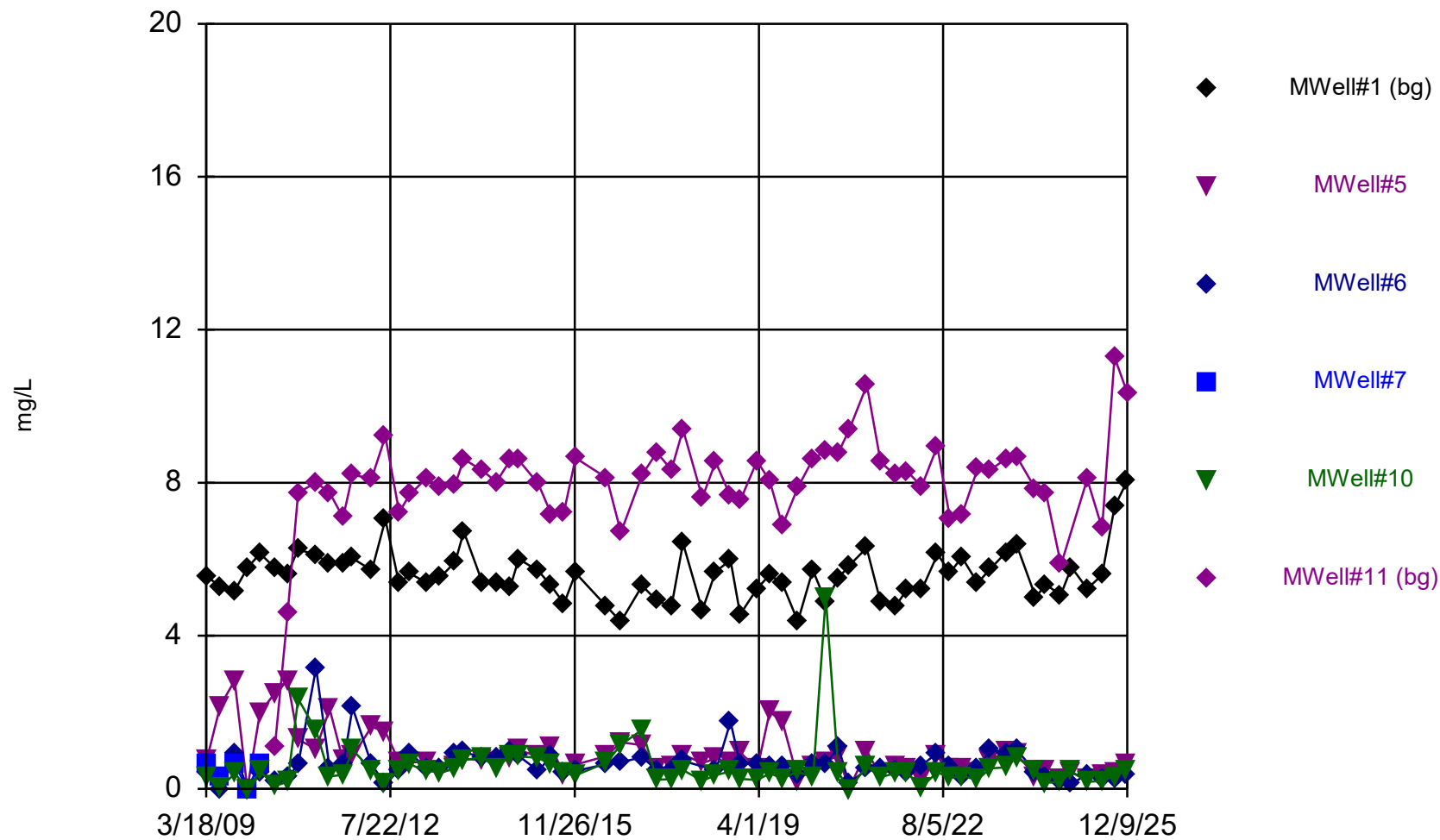
Time Series



Constituent: Conductivity Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

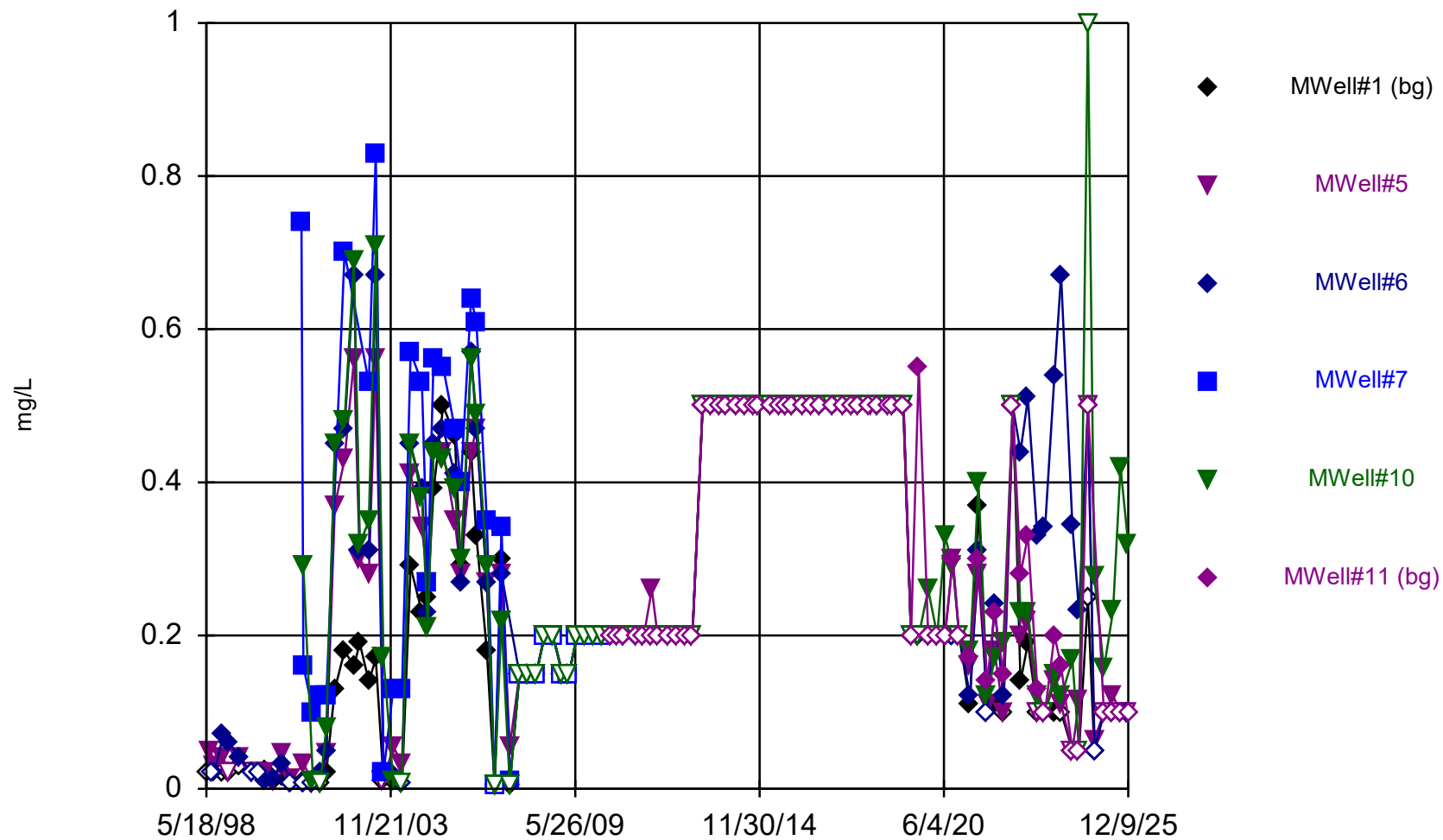
Time Series



Constituent: Dissolved Oxygen Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

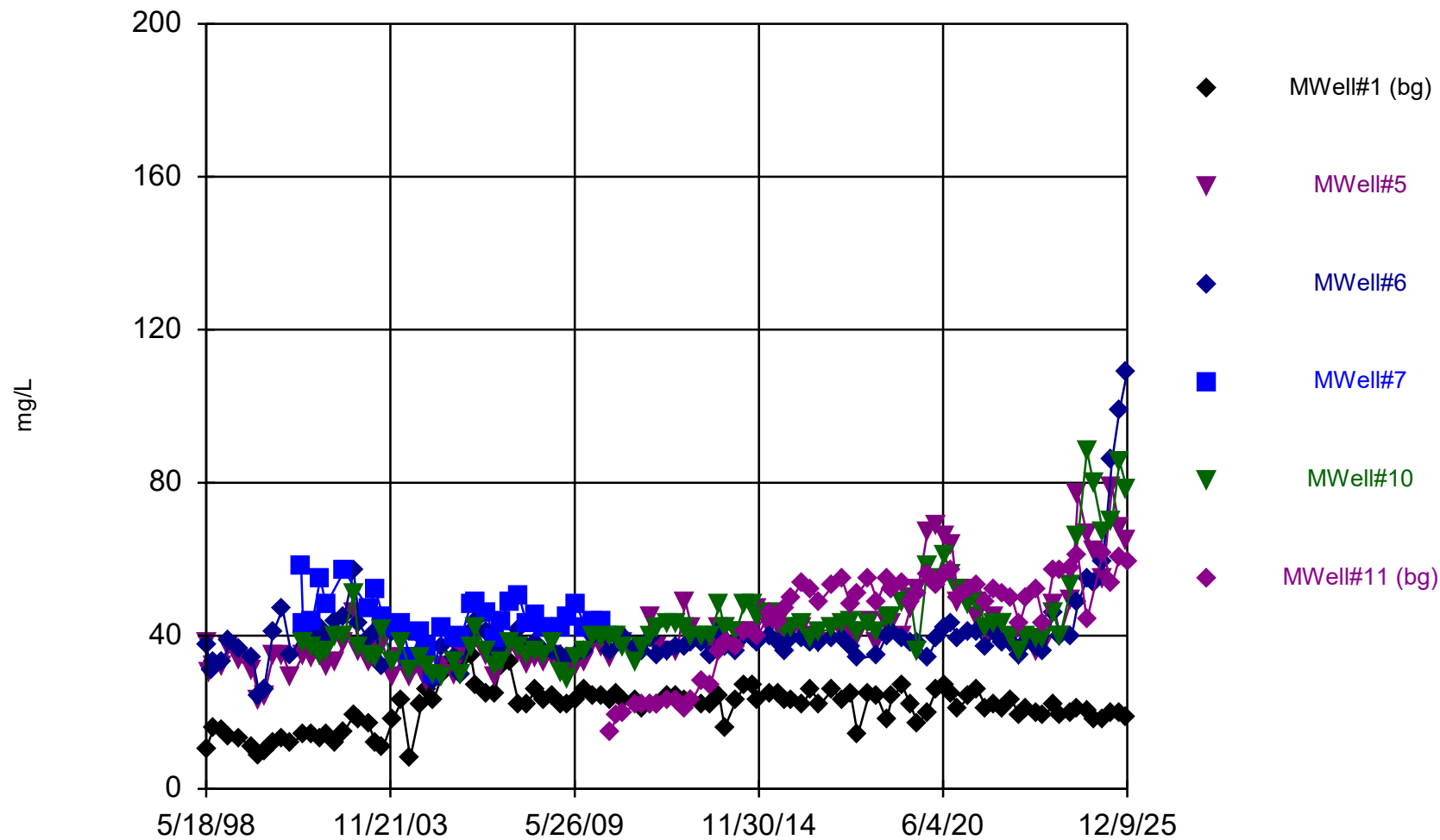
Time Series



Constituent: Iron, Dissolved Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2

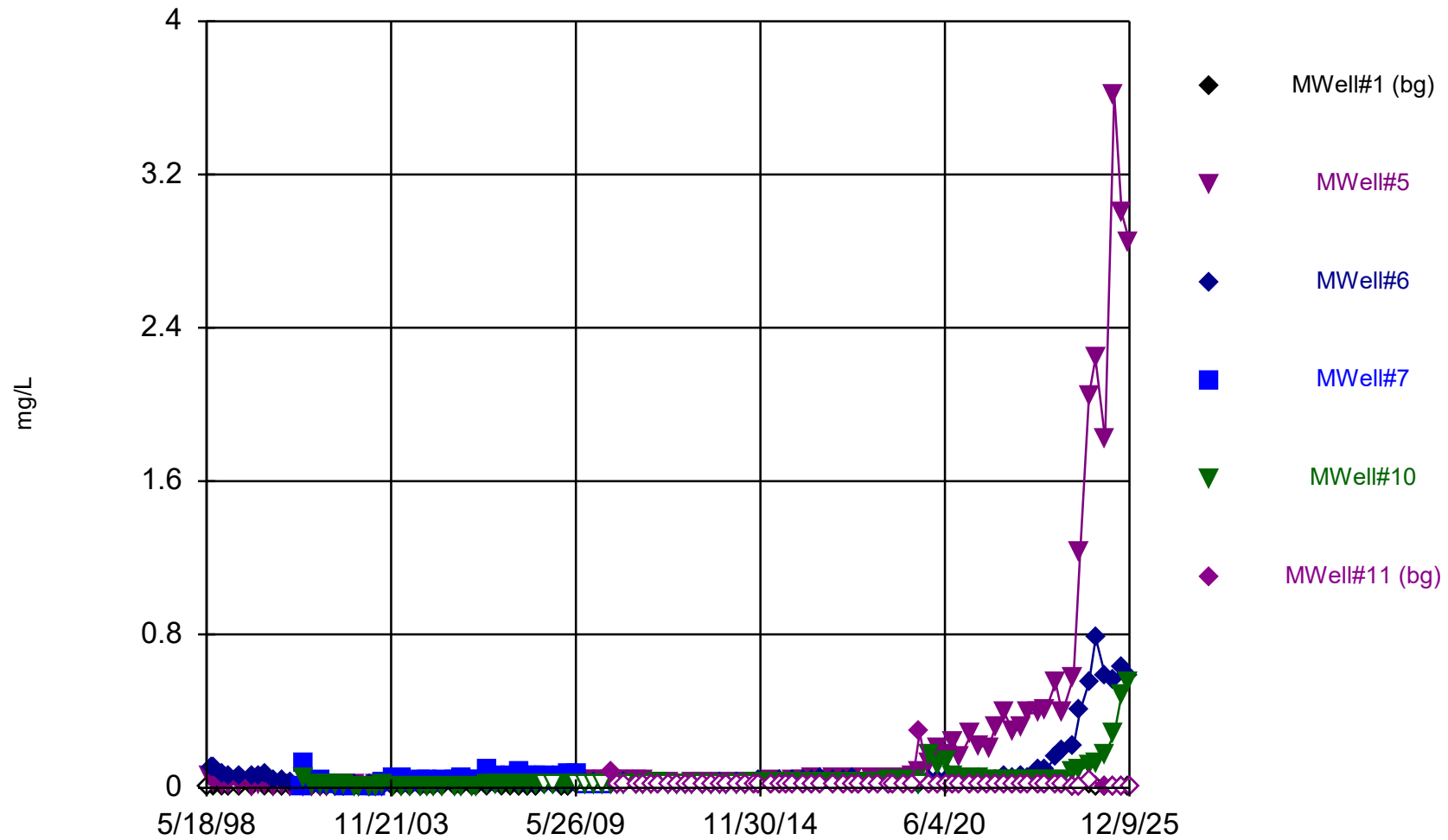
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



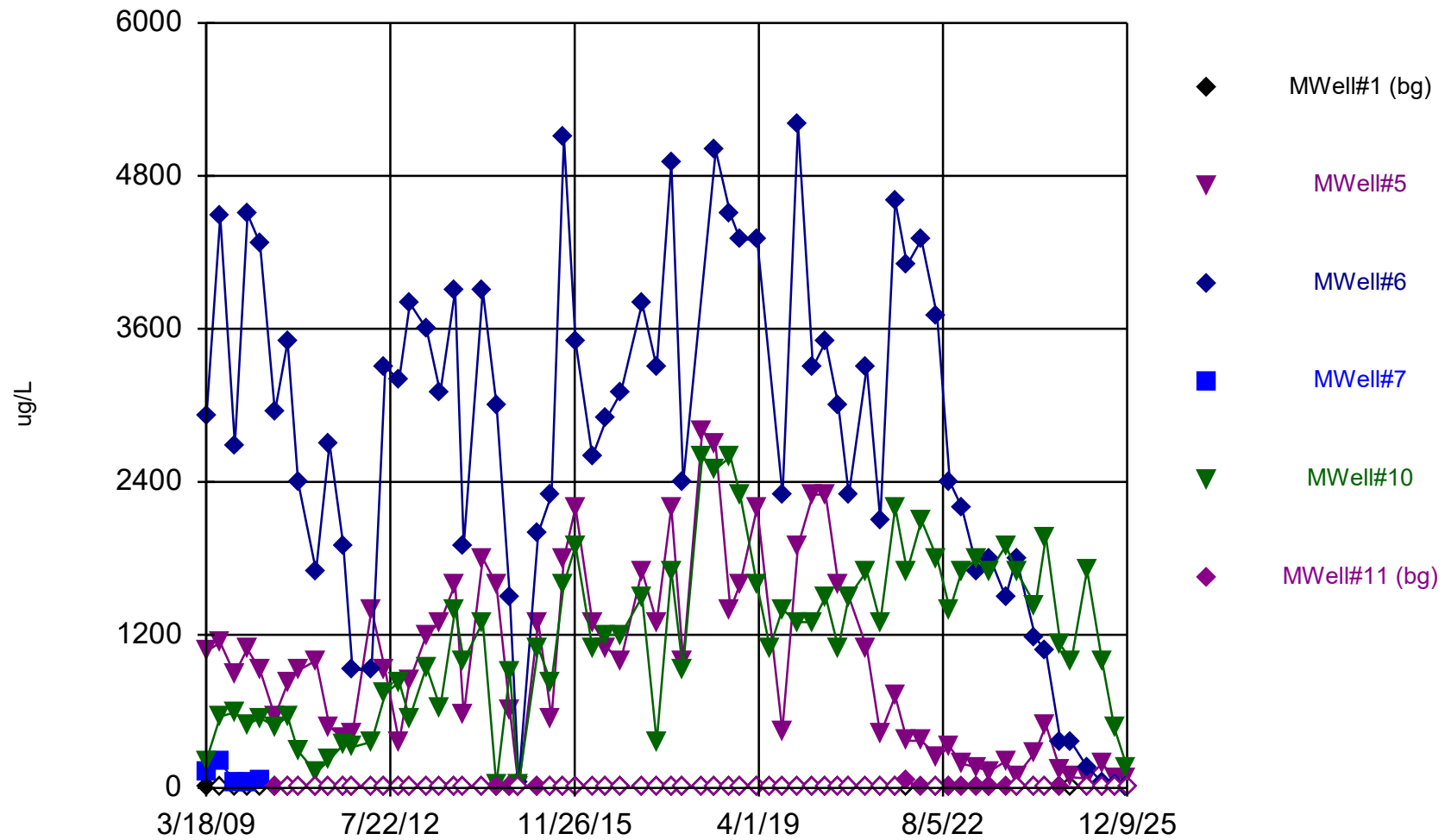
Constituent: Magnesium, Dissolved Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Manganese, Dissolved Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

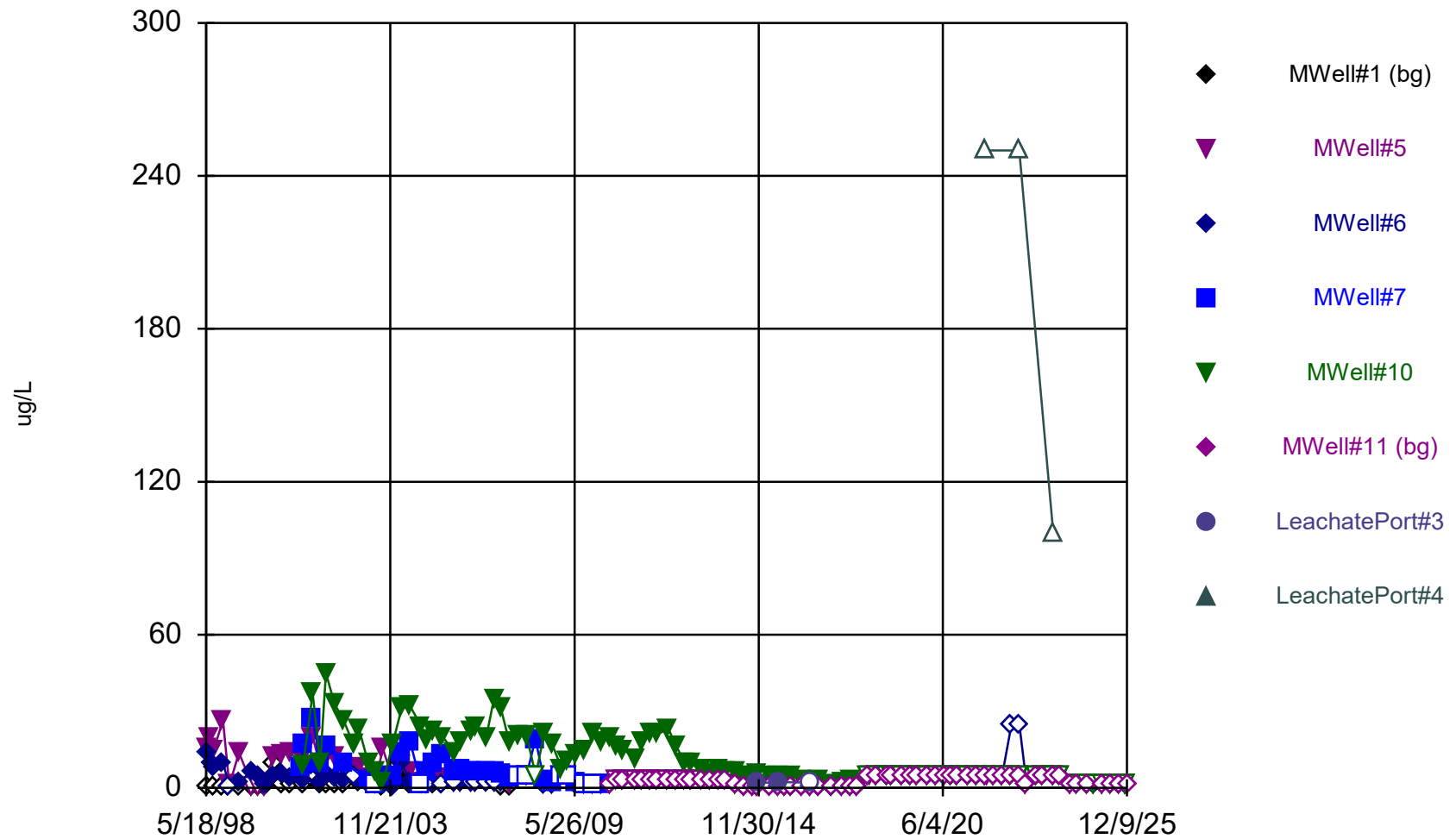
Time Series



Constituent: Methane Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2

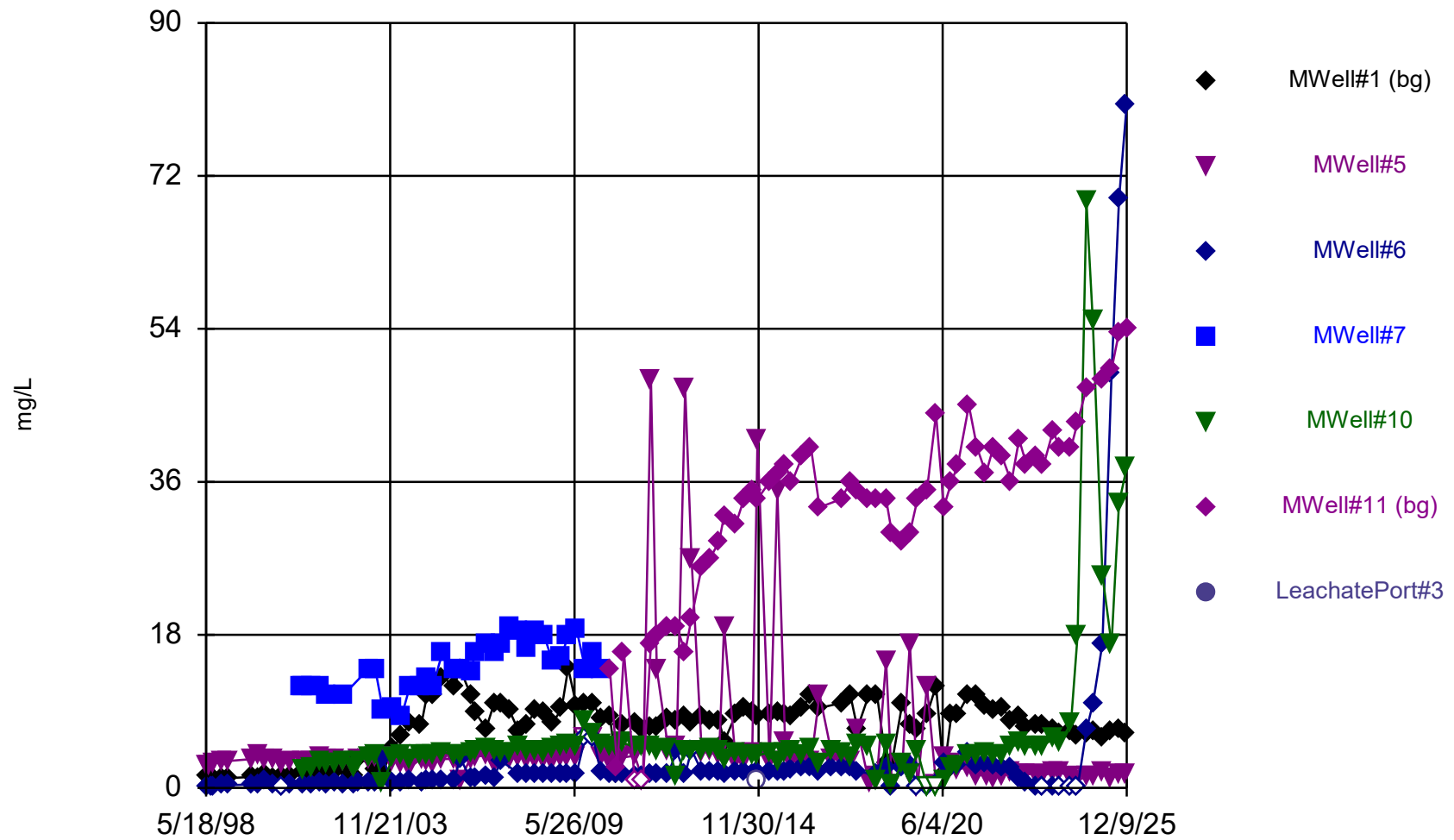
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



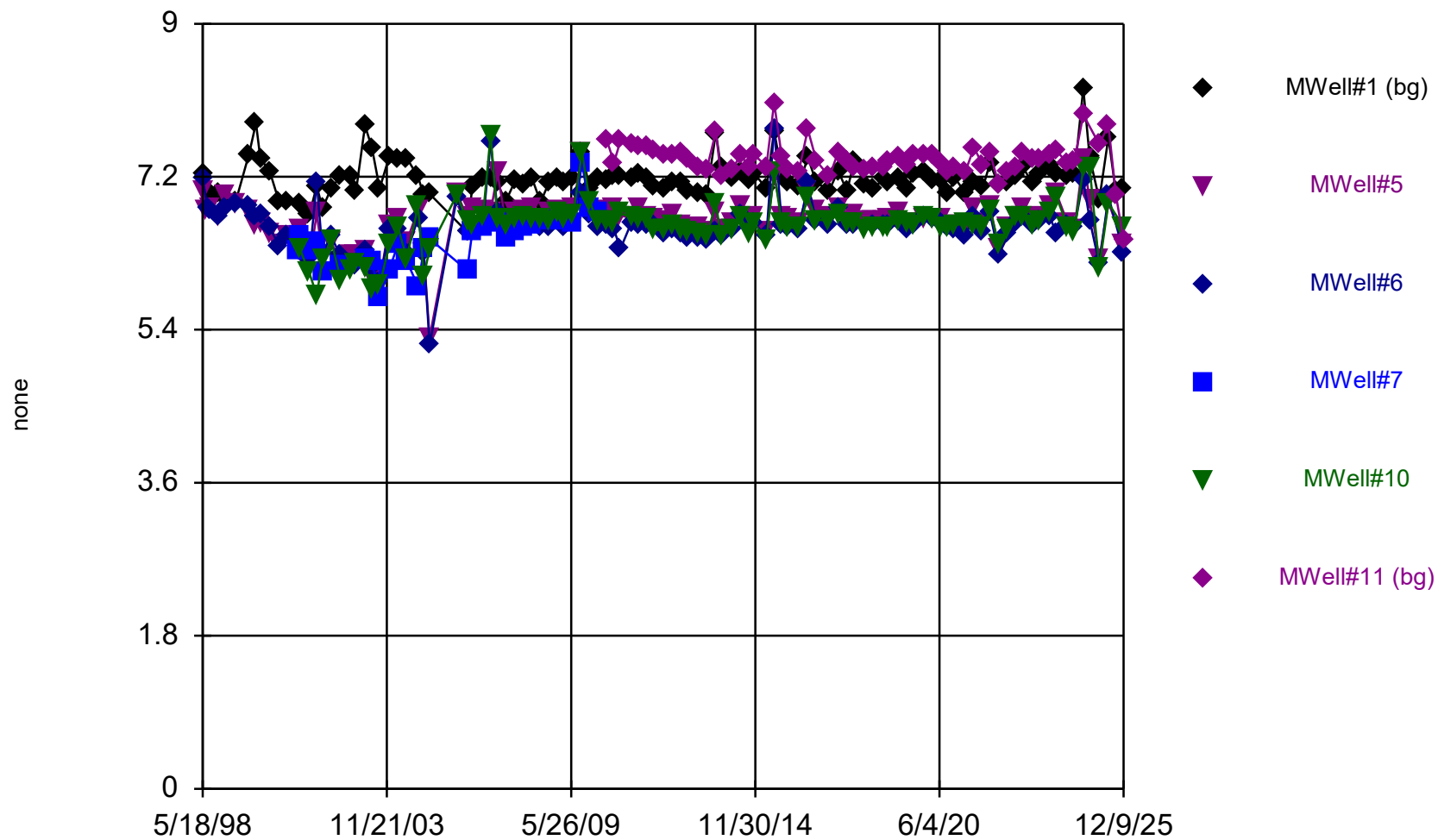
Constituent: Methylene Chloride Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Nitrate Nitrogen Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

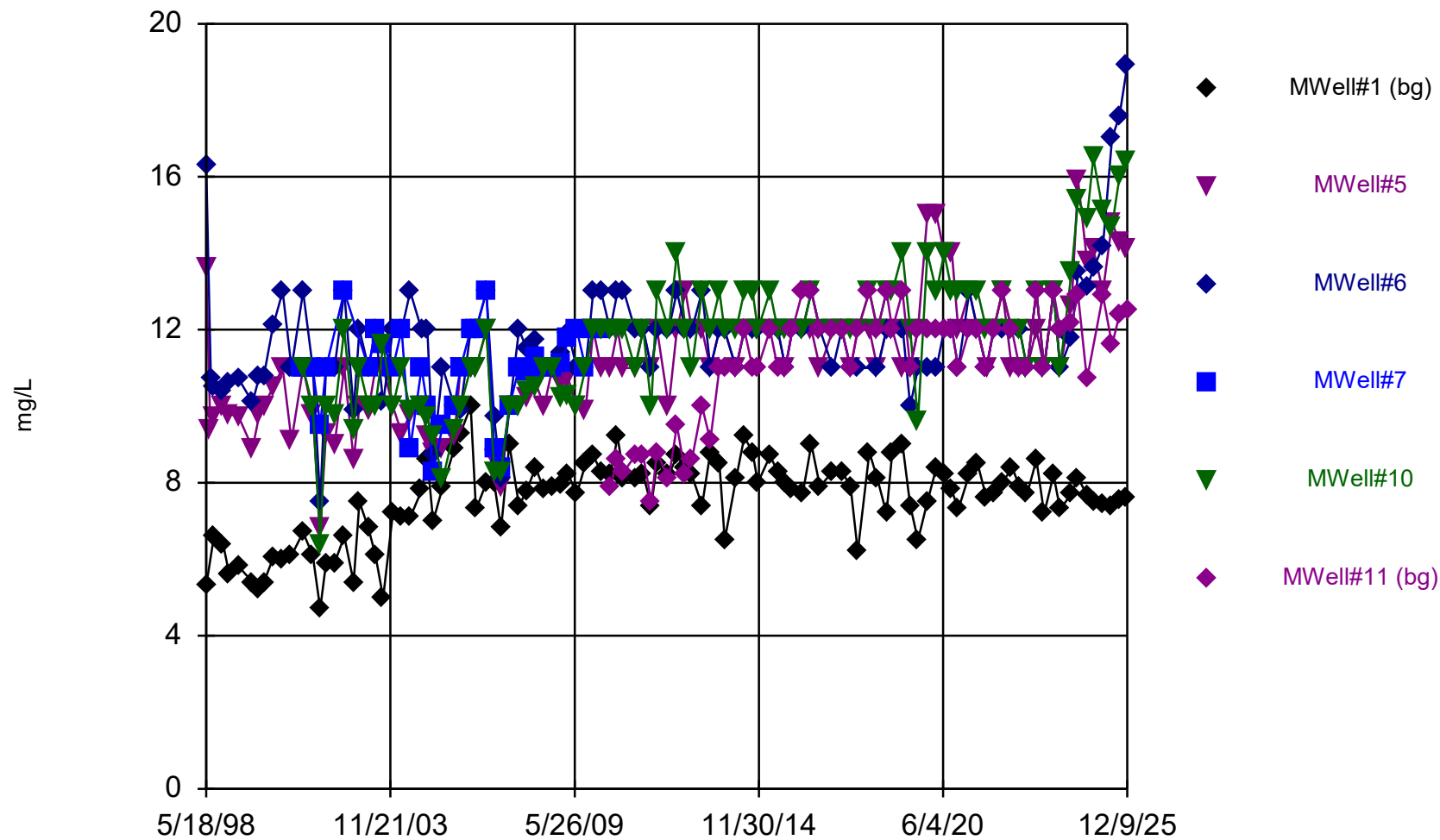
Time Series



Constituent: pH Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2

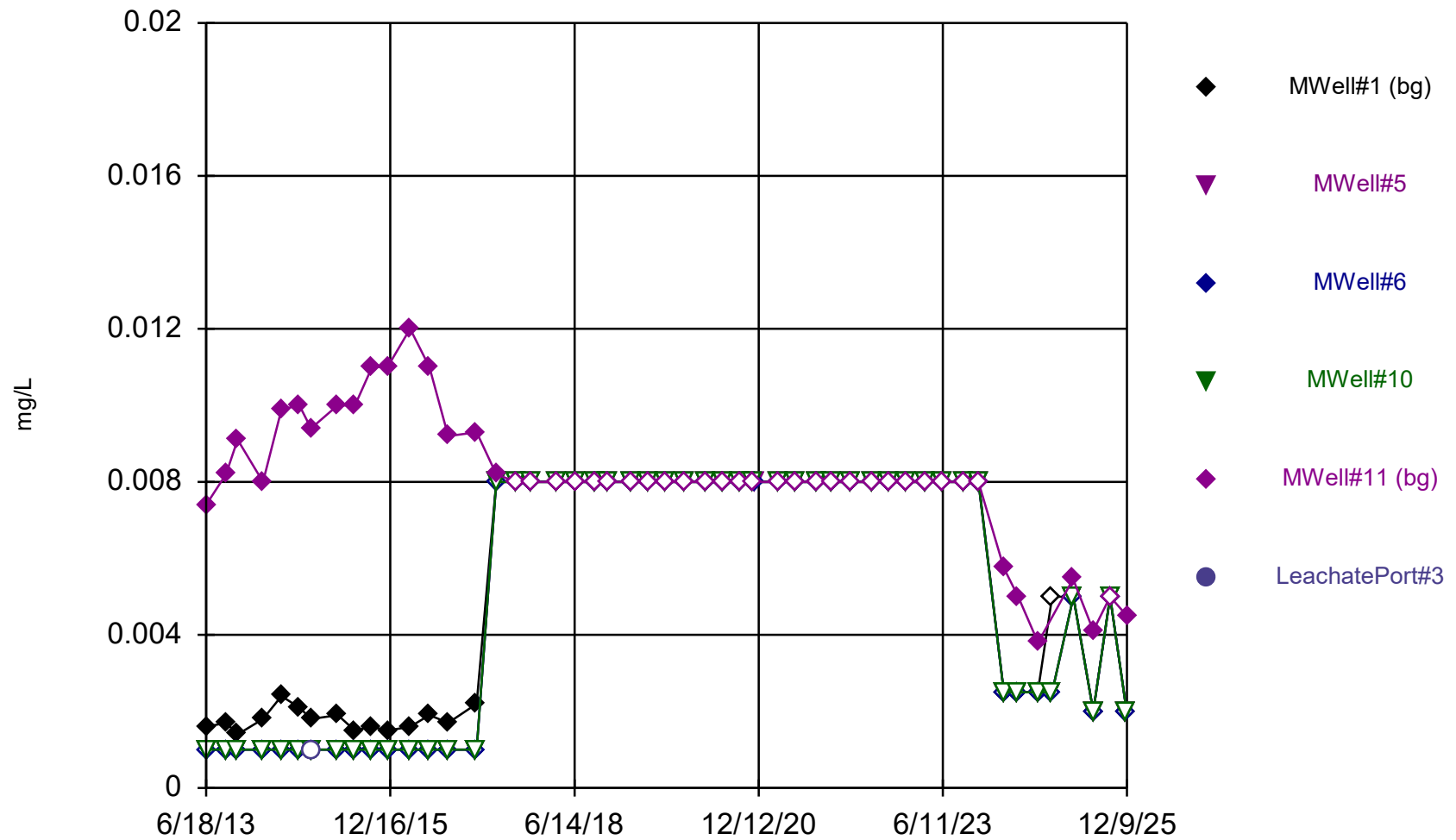
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



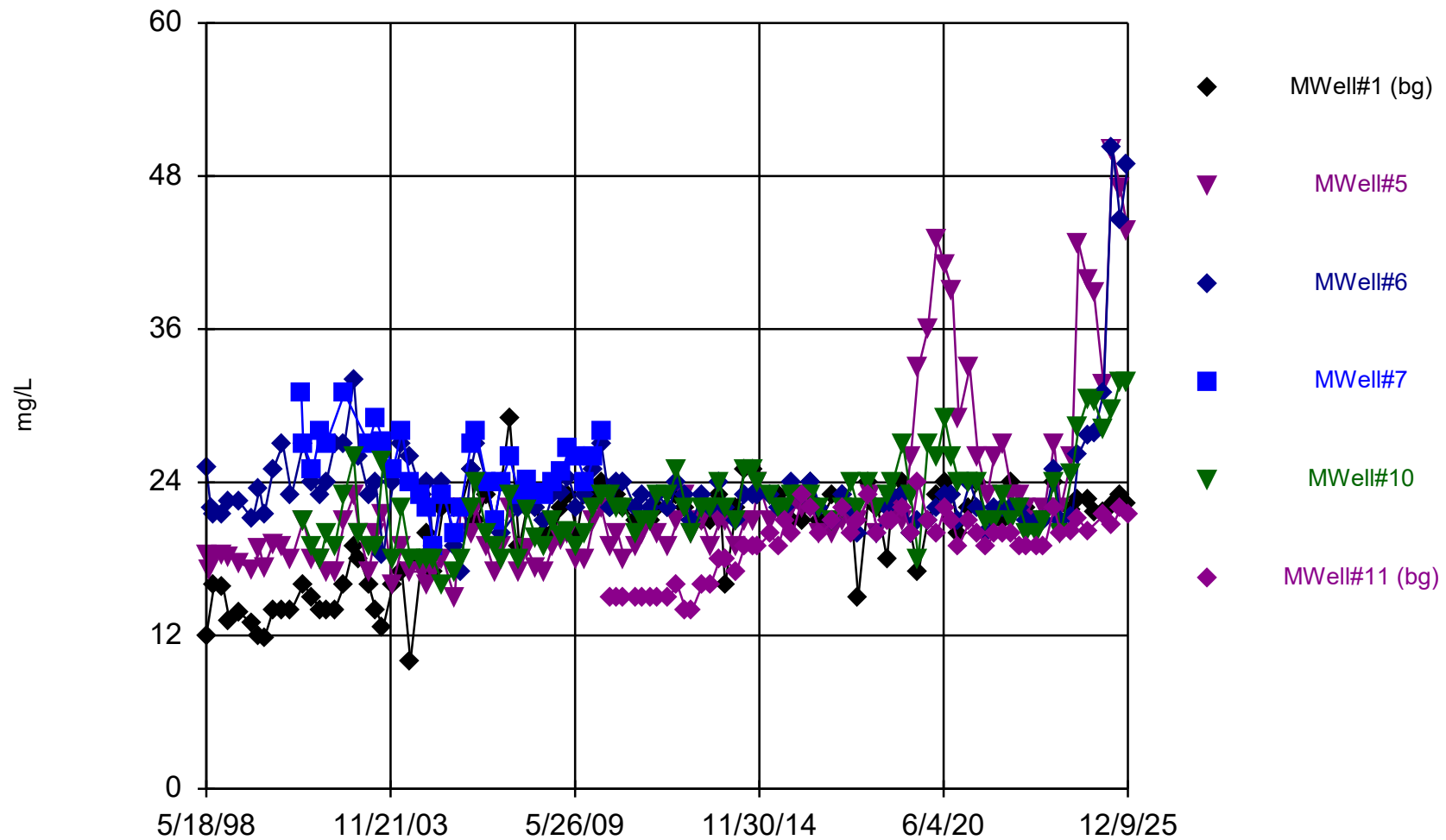
Constituent: Potassium, Dissolved Analysis Run 3/17/2026 4:29 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



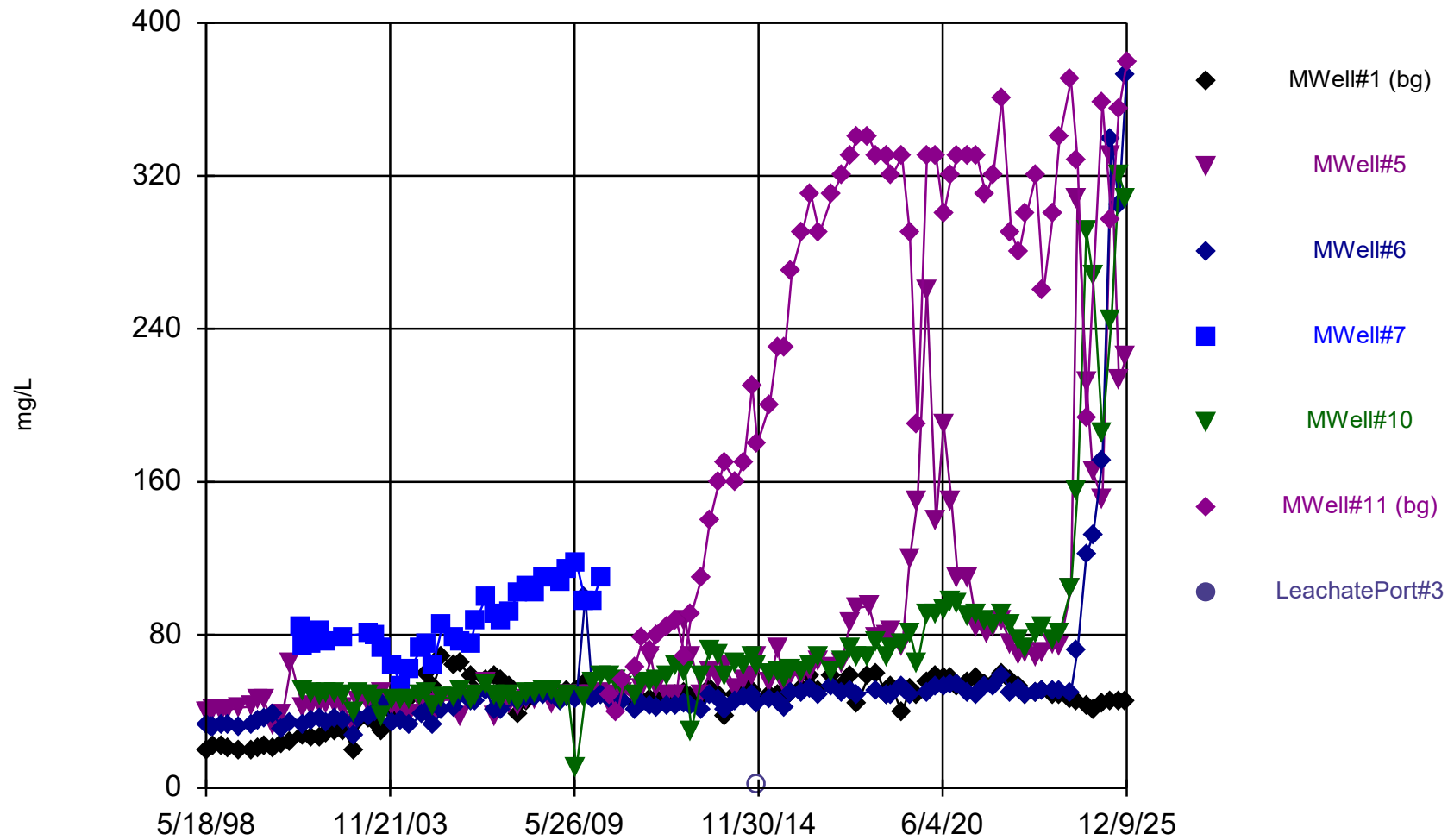
Constituent: Selenium, Total Analysis Run 3/17/2026 4:30 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Sodium, Dissolved Analysis Run 3/17/2026 4:30 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

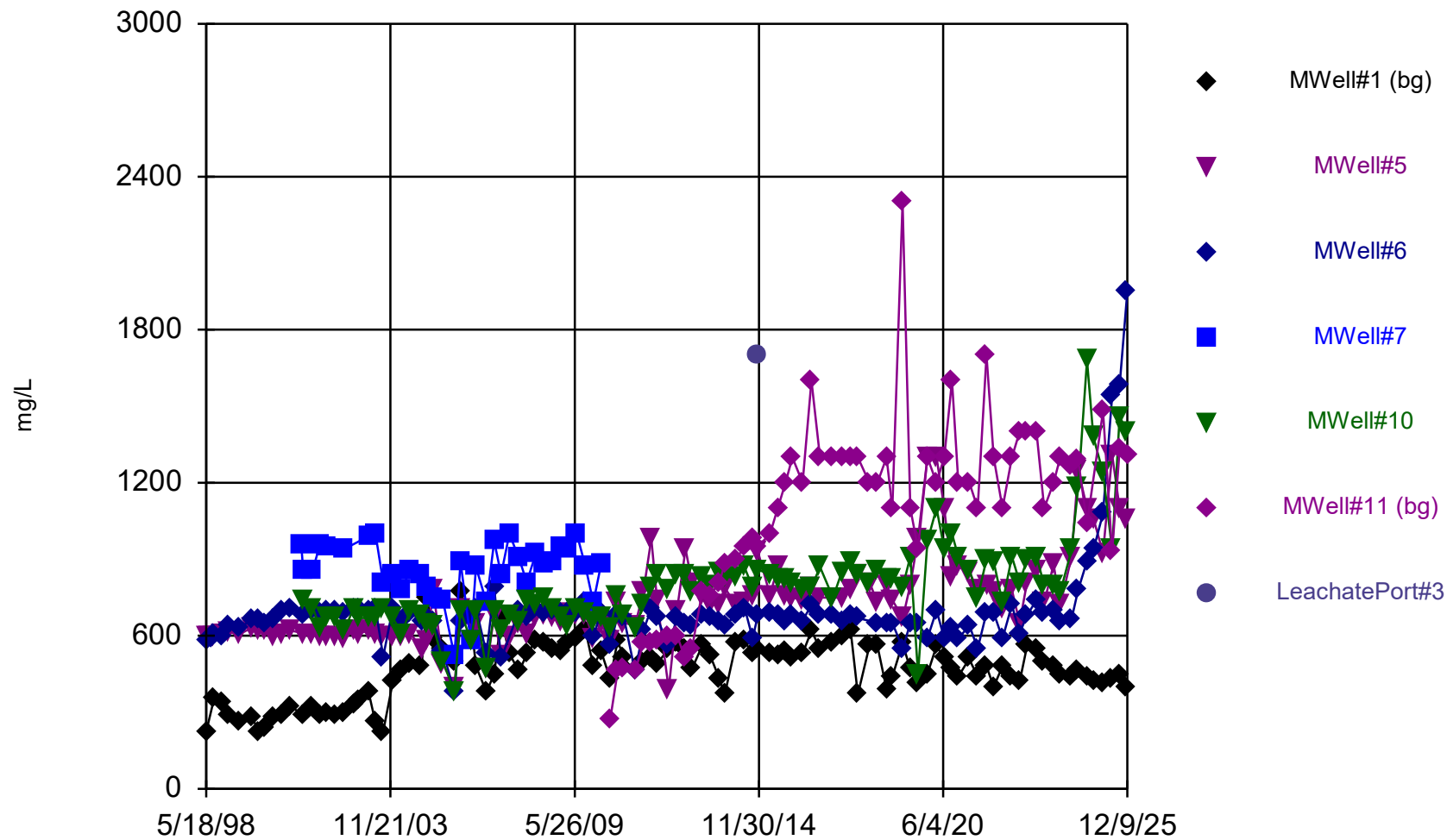
Time Series



Constituent: Sulfate Analysis Run 3/17/2026 4:30 PM View: HRLF_TSP Set2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

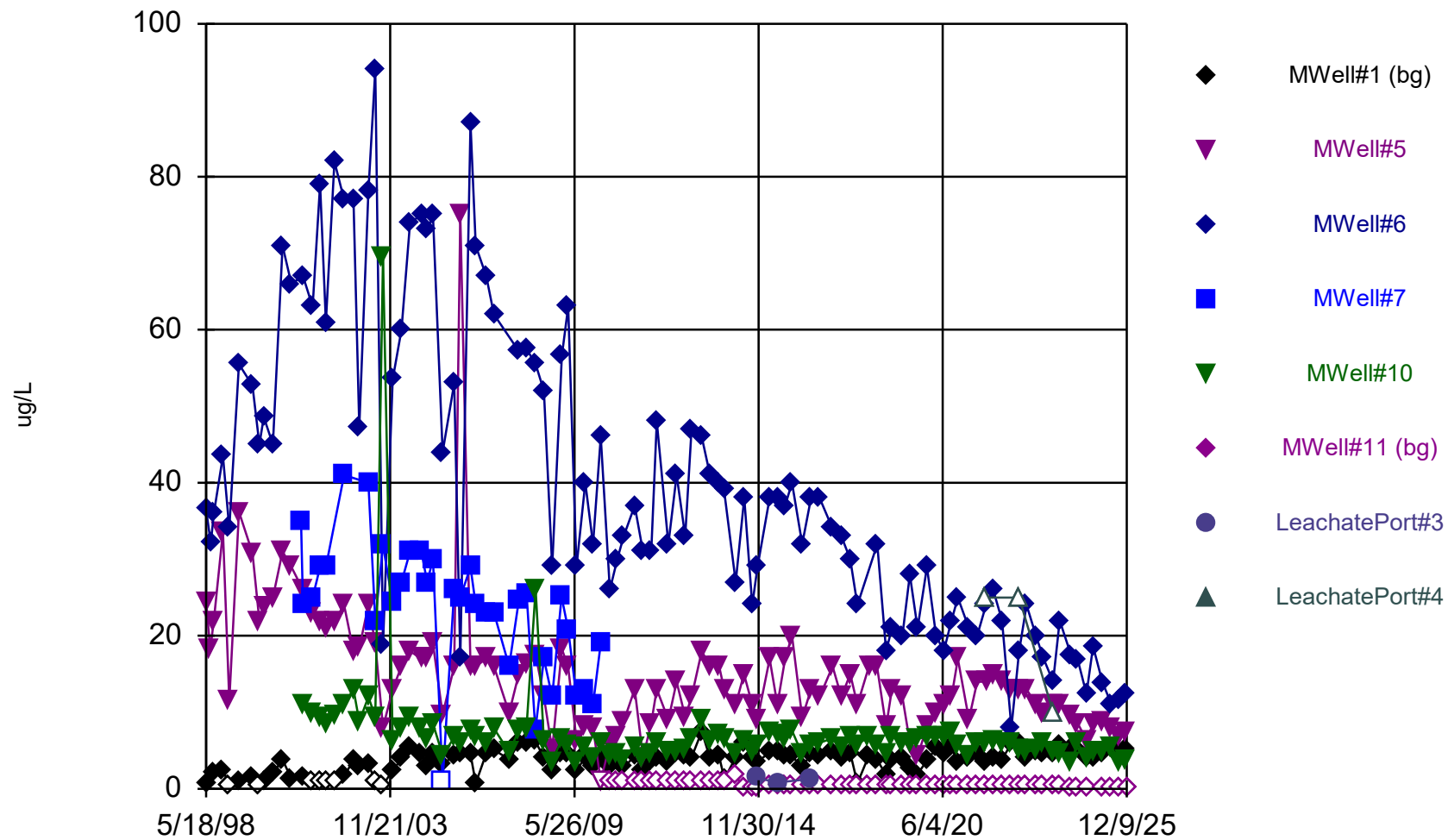
Time Series



Constituent: TDS Analysis Run 3/17/2026 4:30 PM View: HRLF_TSP Set2

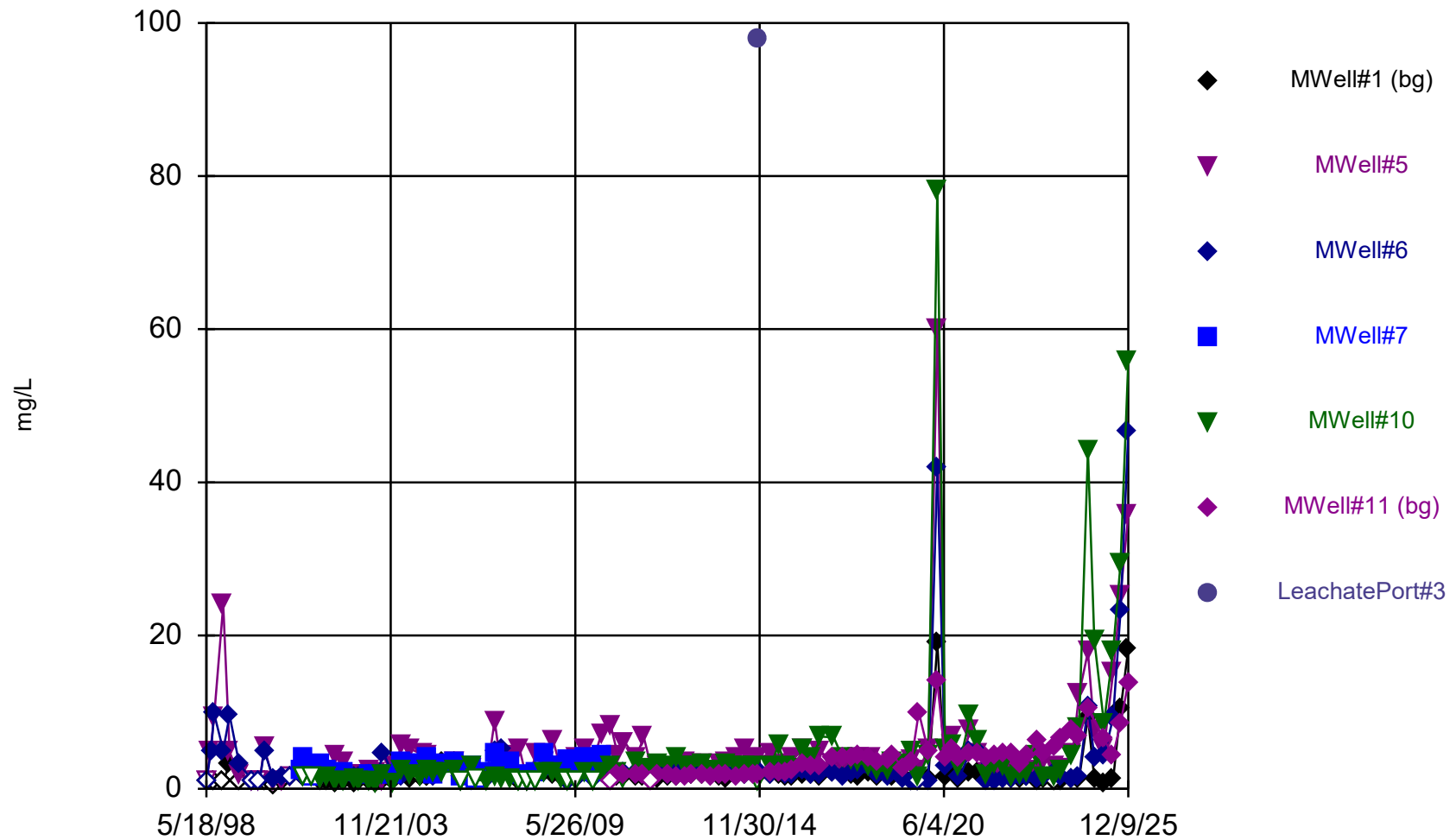
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Tetrachloroethene Analysis Run 3/17/2026 4:30 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

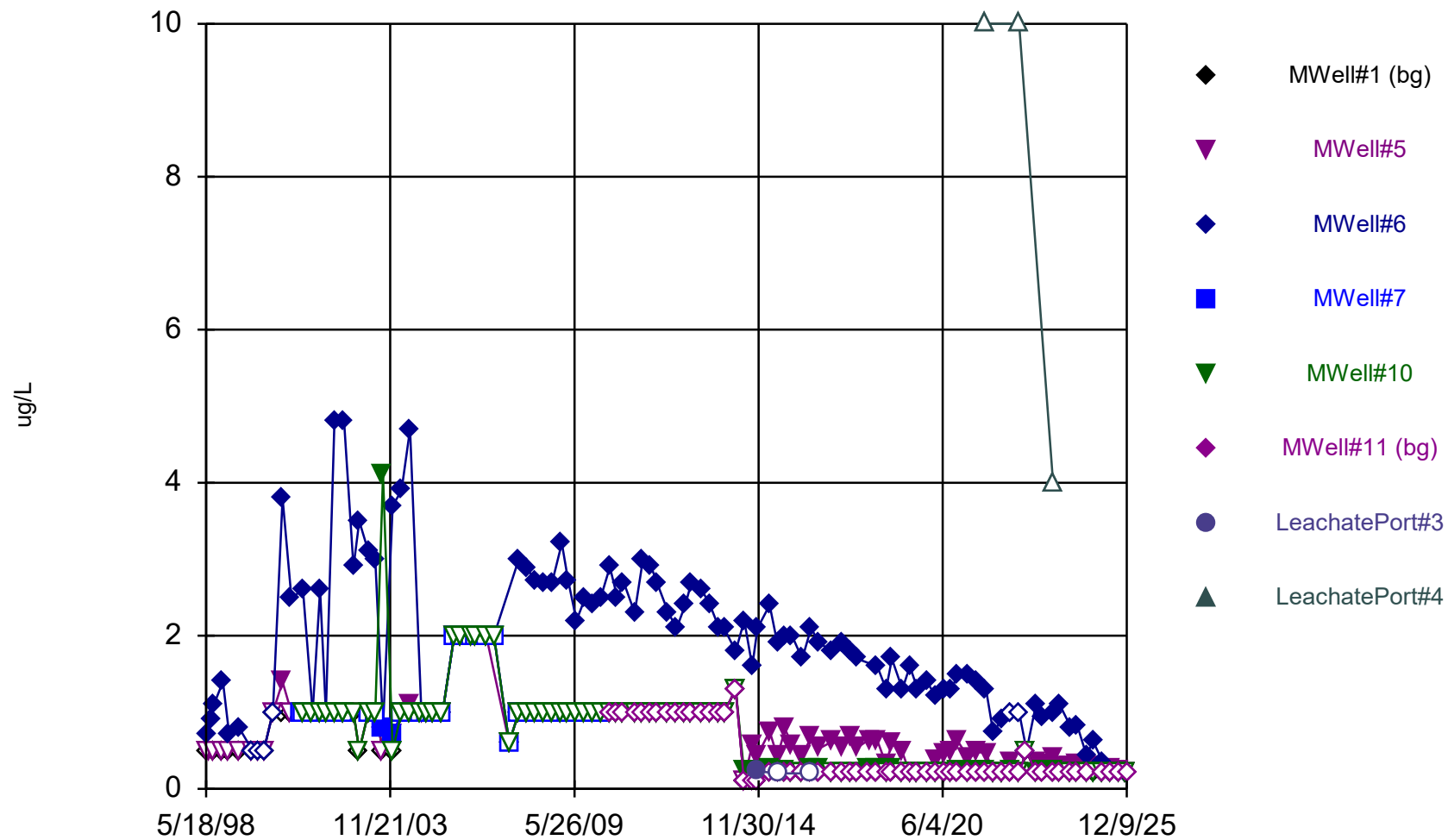
Time Series



Constituent: TOC Analysis Run 3/17/2026 4:30 PM View: HRLF_TSP Set2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

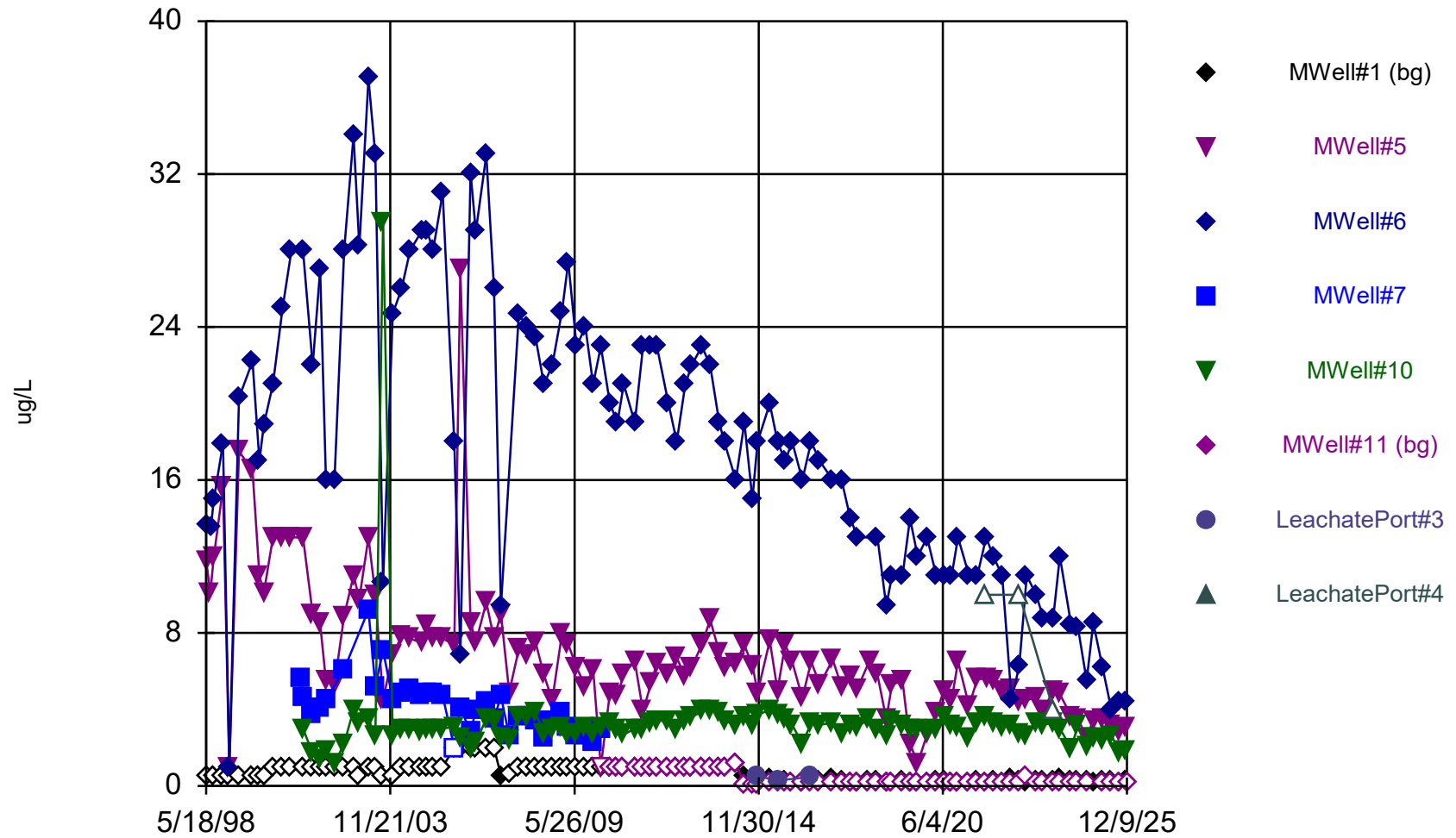
Time Series



Constituent: trans-1,2-Dichloroethene Analysis Run 3/17/2026 4:30 PM View: HRLF_TSP Set2

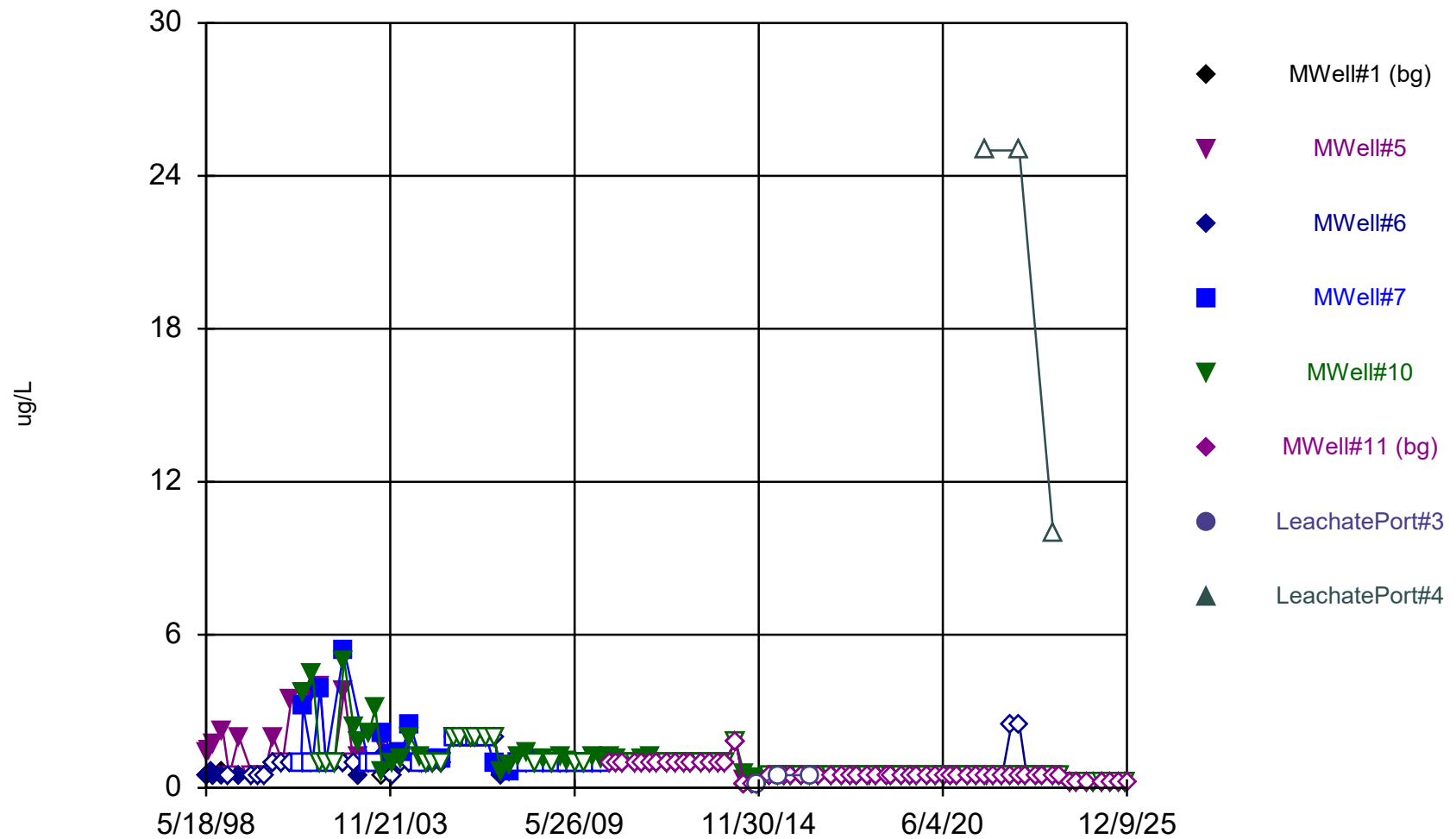
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



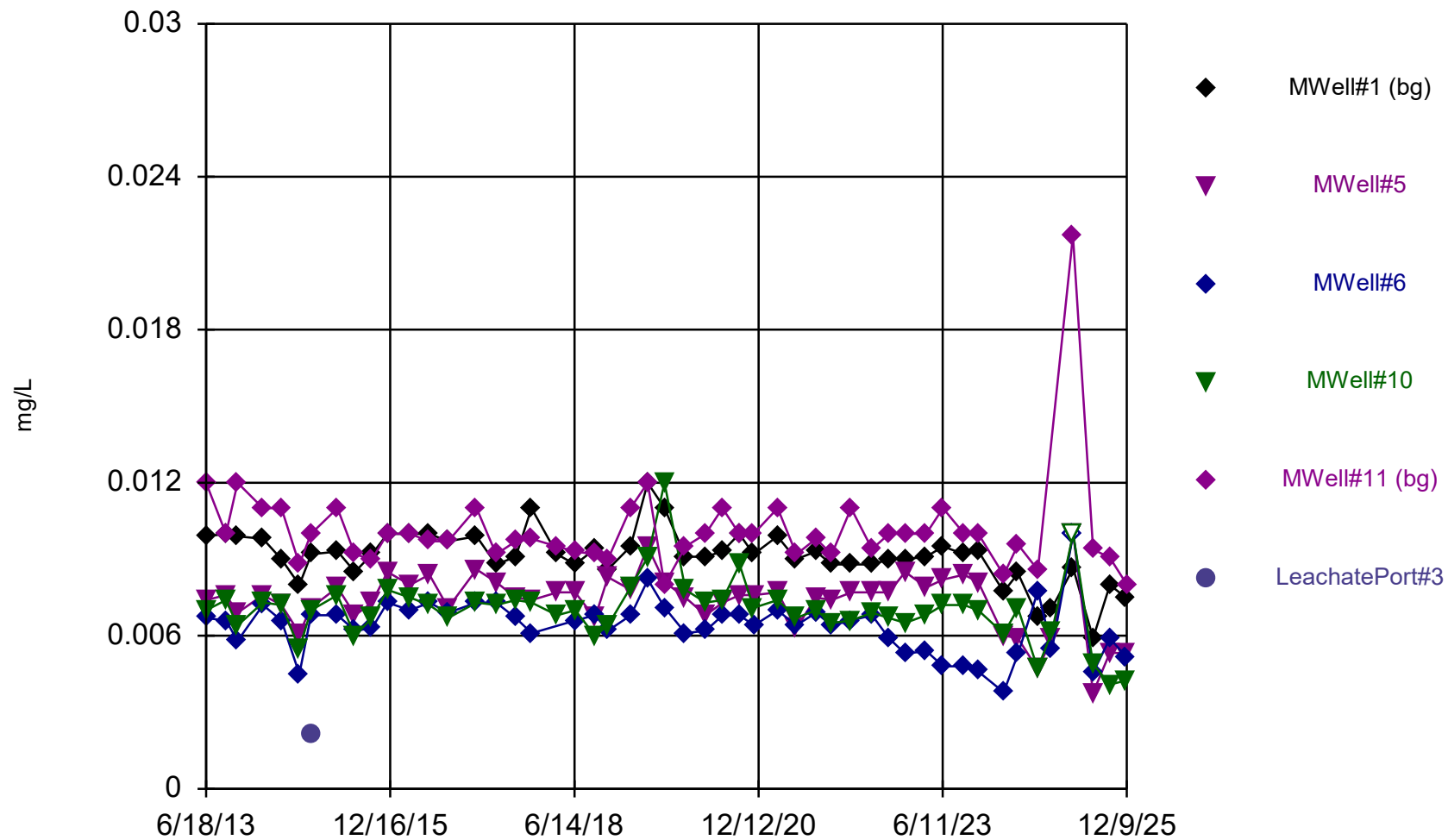
Constituent: Trichloroethene Analysis Run 3/17/2026 4:30 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



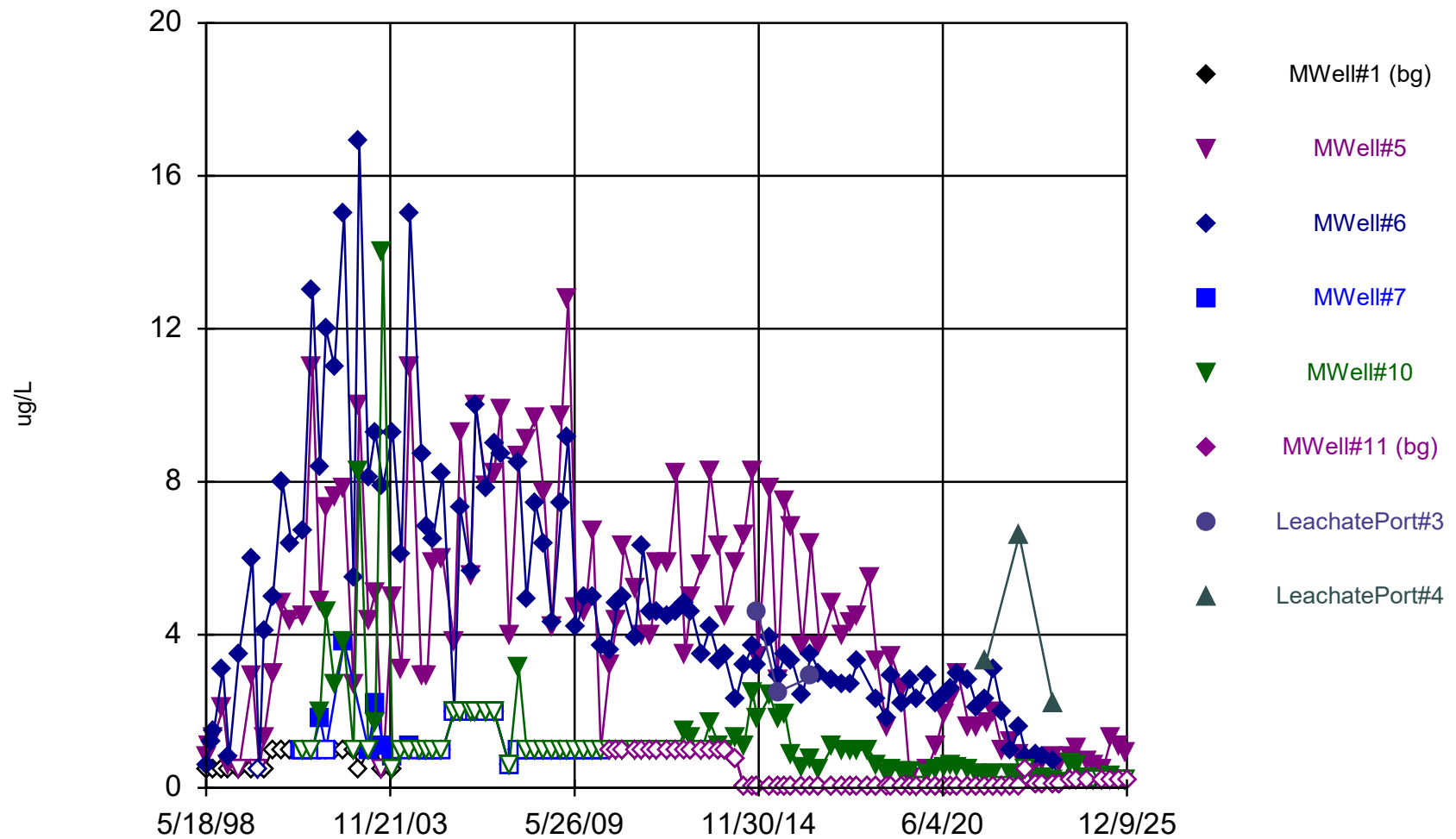
Constituent: Trichlorofluoromethane Analysis Run 3/17/2026 4:30 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: Vanadium, Total Analysis Run 3/17/2026 4:30 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

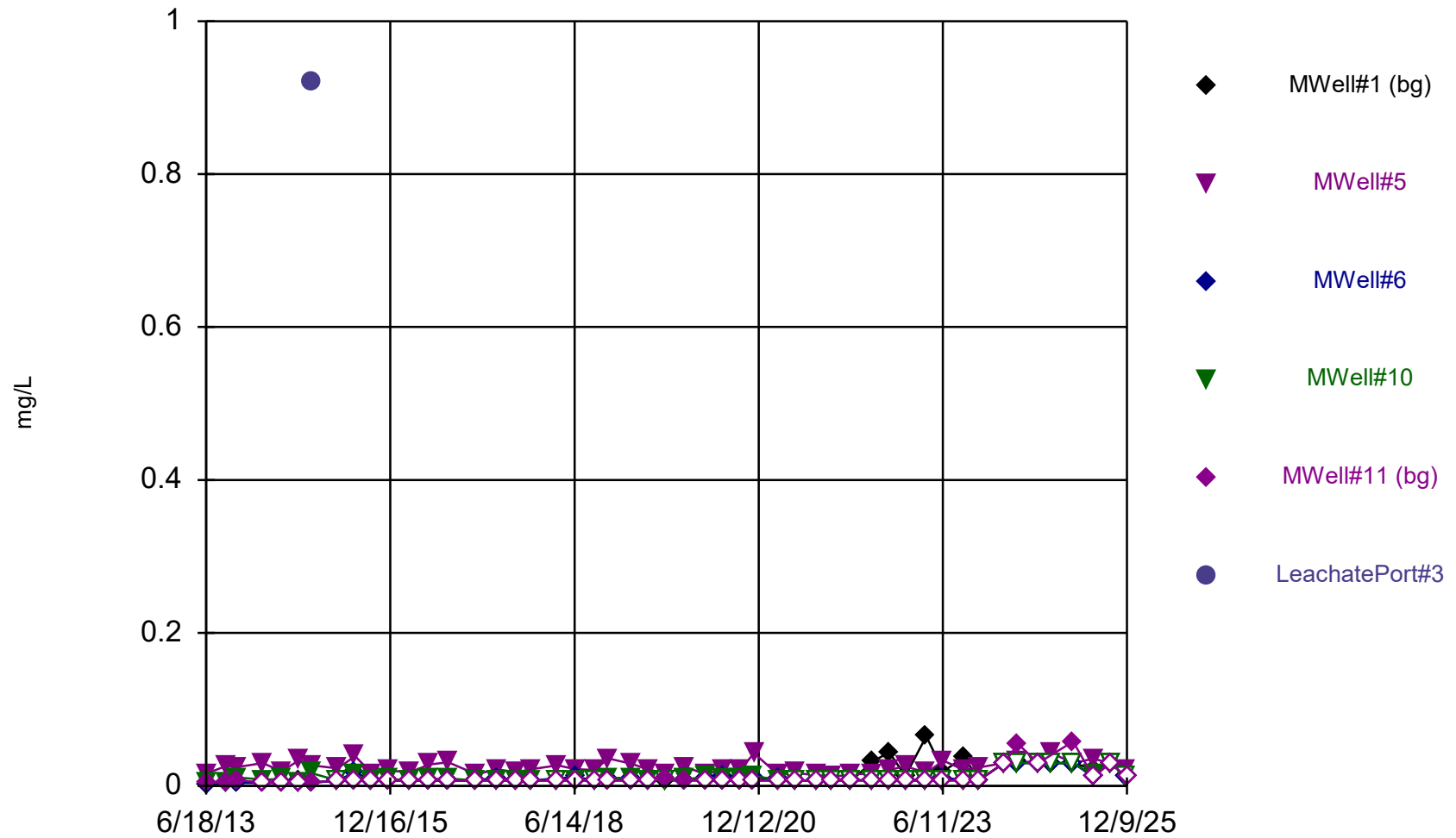
Time Series



Constituent: Vinyl Chloride Analysis Run 3/17/2026 4:30 PM View: HRLF_TSP Set2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series

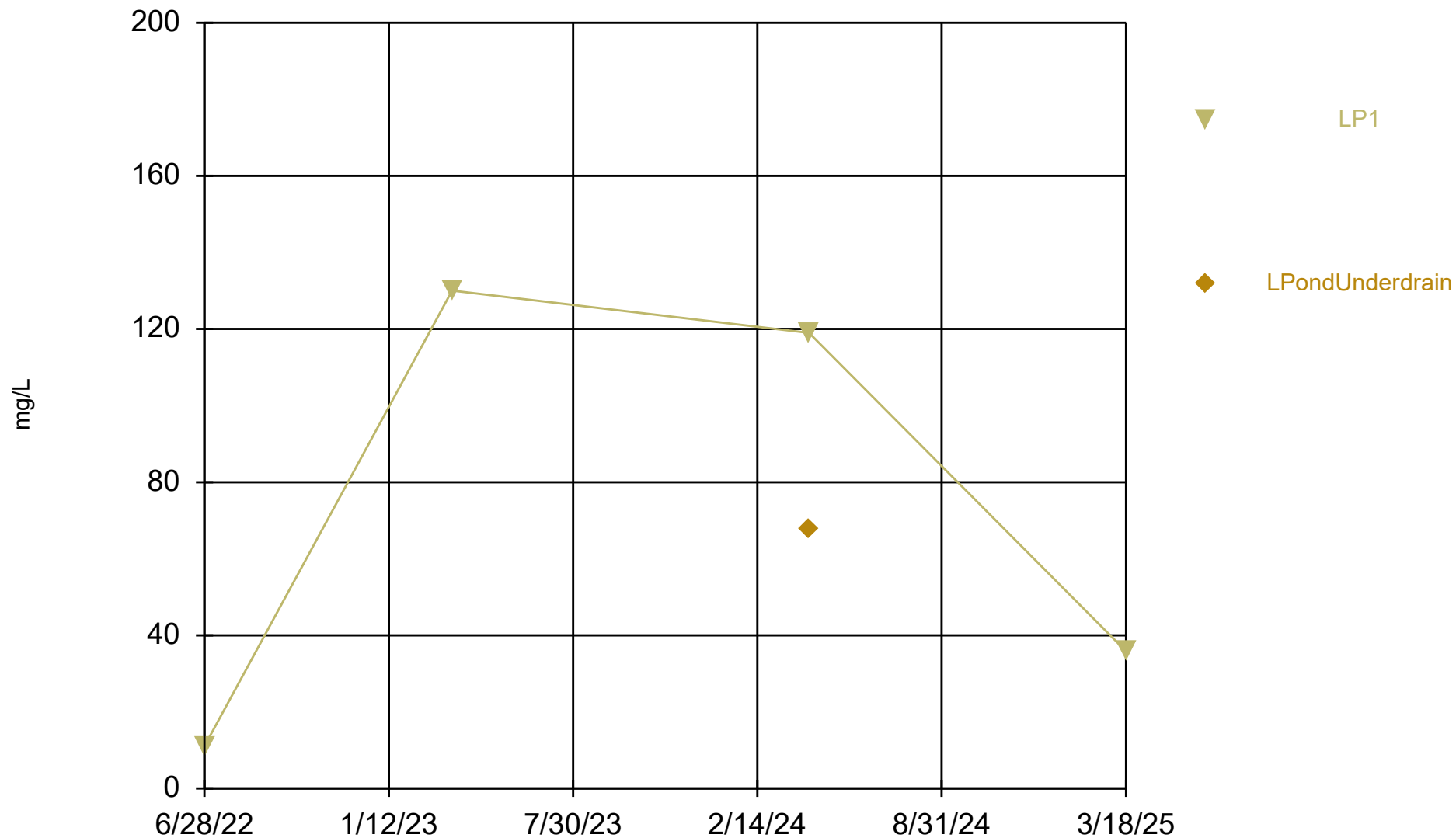


Constituent: Zinc, Total Analysis Run 3/17/2026 4:30 PM View: HRLF_TSP Set2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

C-2

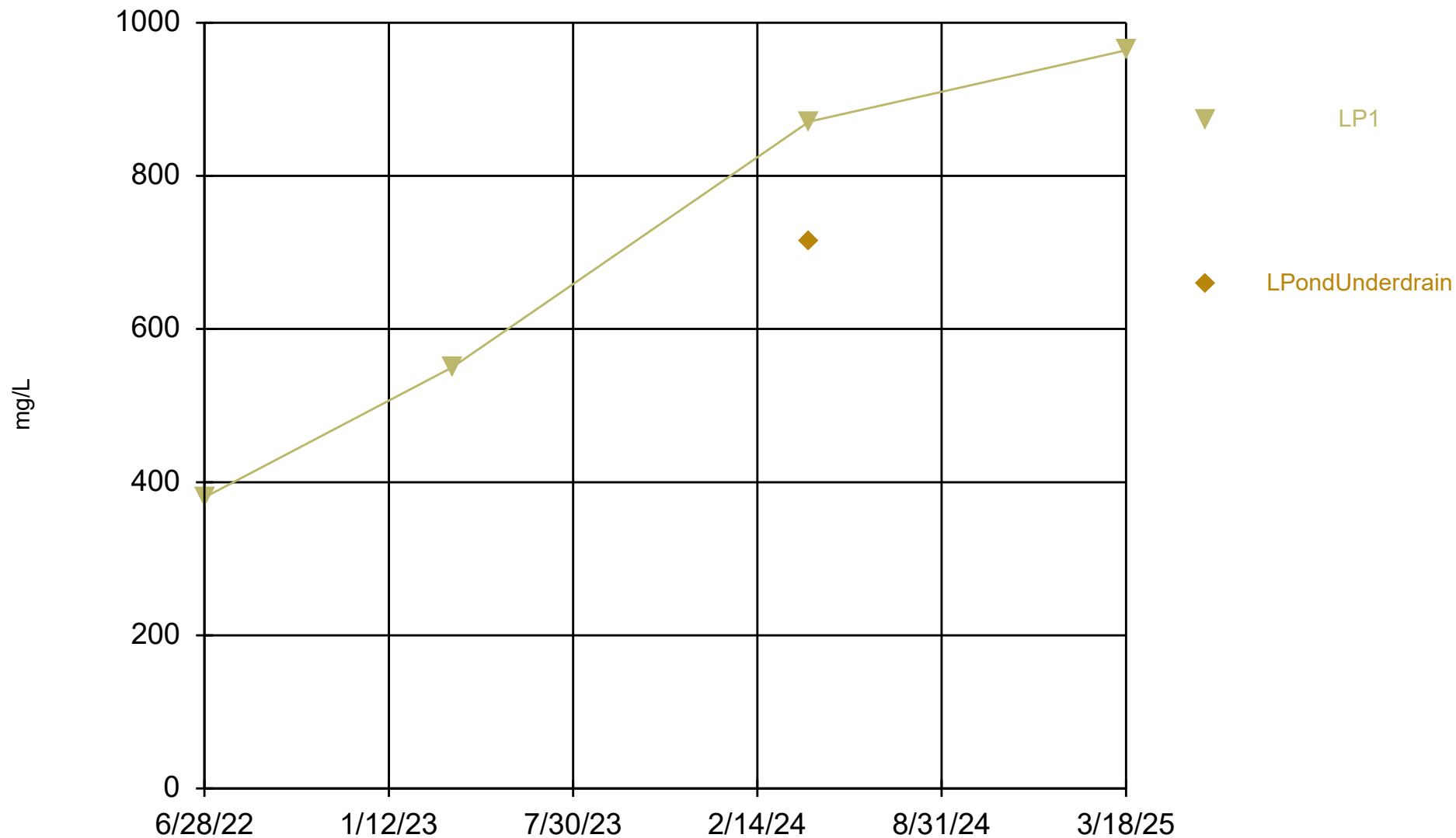
Leachate Pond and
Pond Underdrain

Time Series



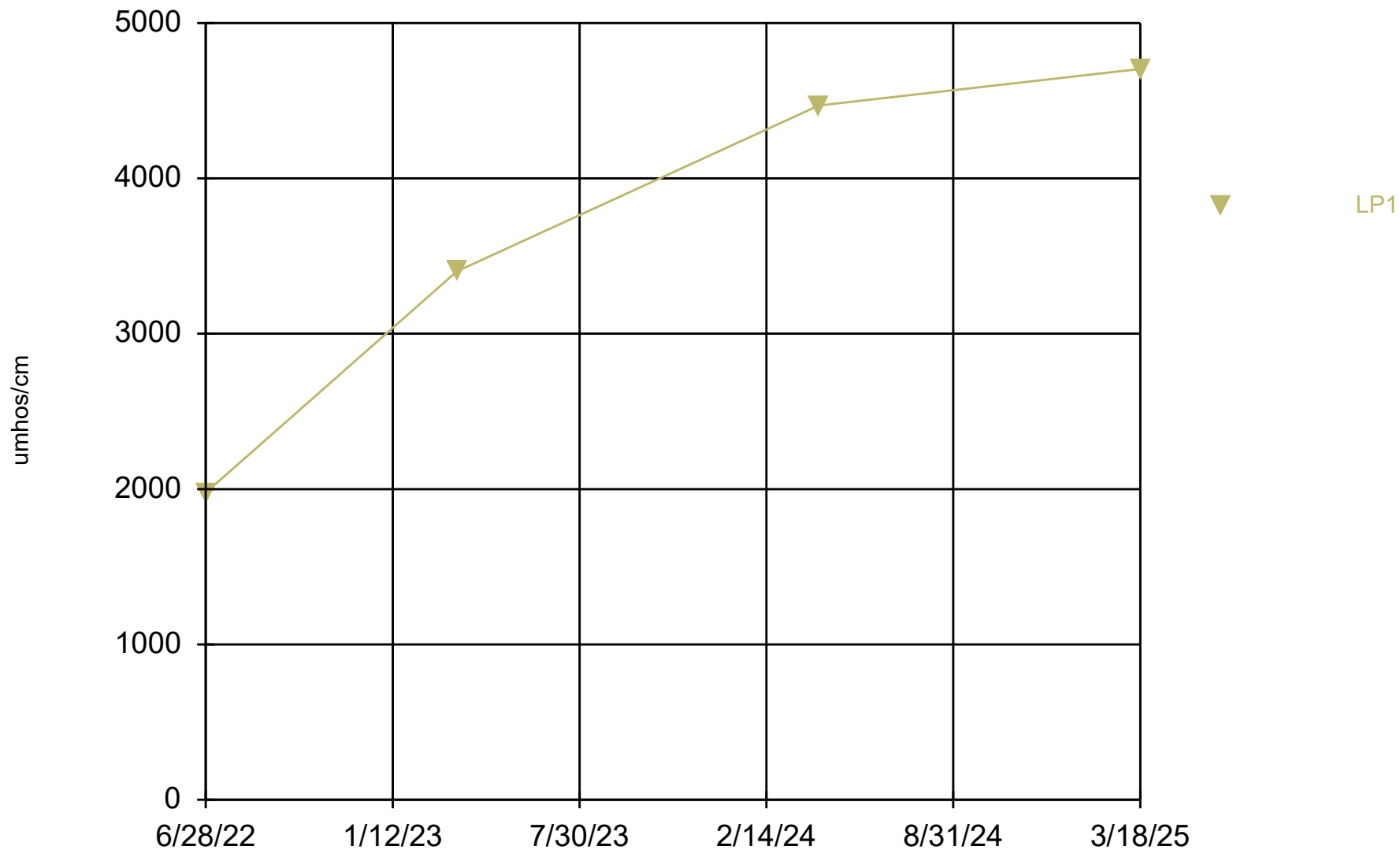
Constituent: Calcium, Dissolved Analysis Run 3/12/2026 5:15 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



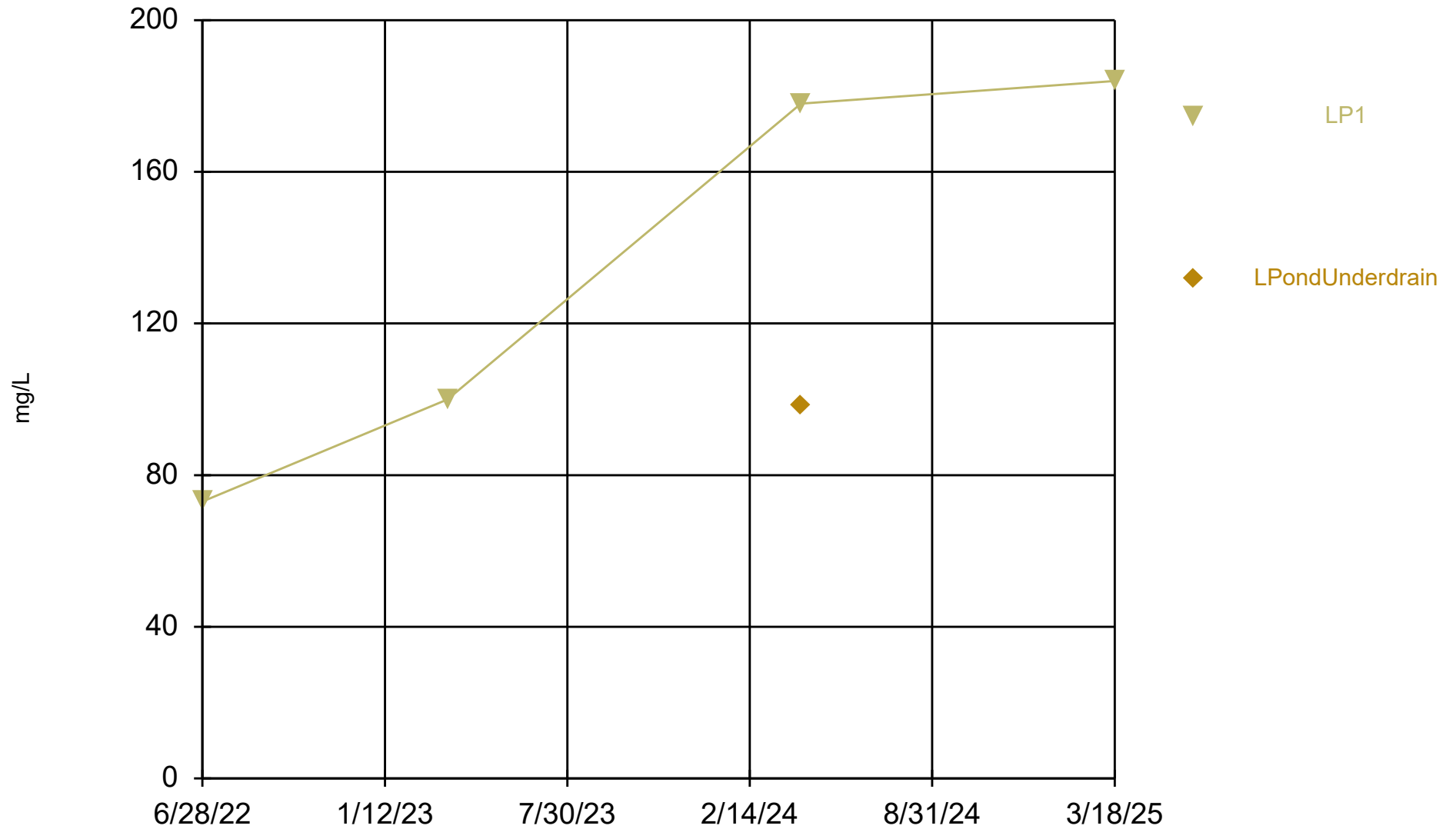
Constituent: Chloride Analysis Run 3/12/2026 5:15 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



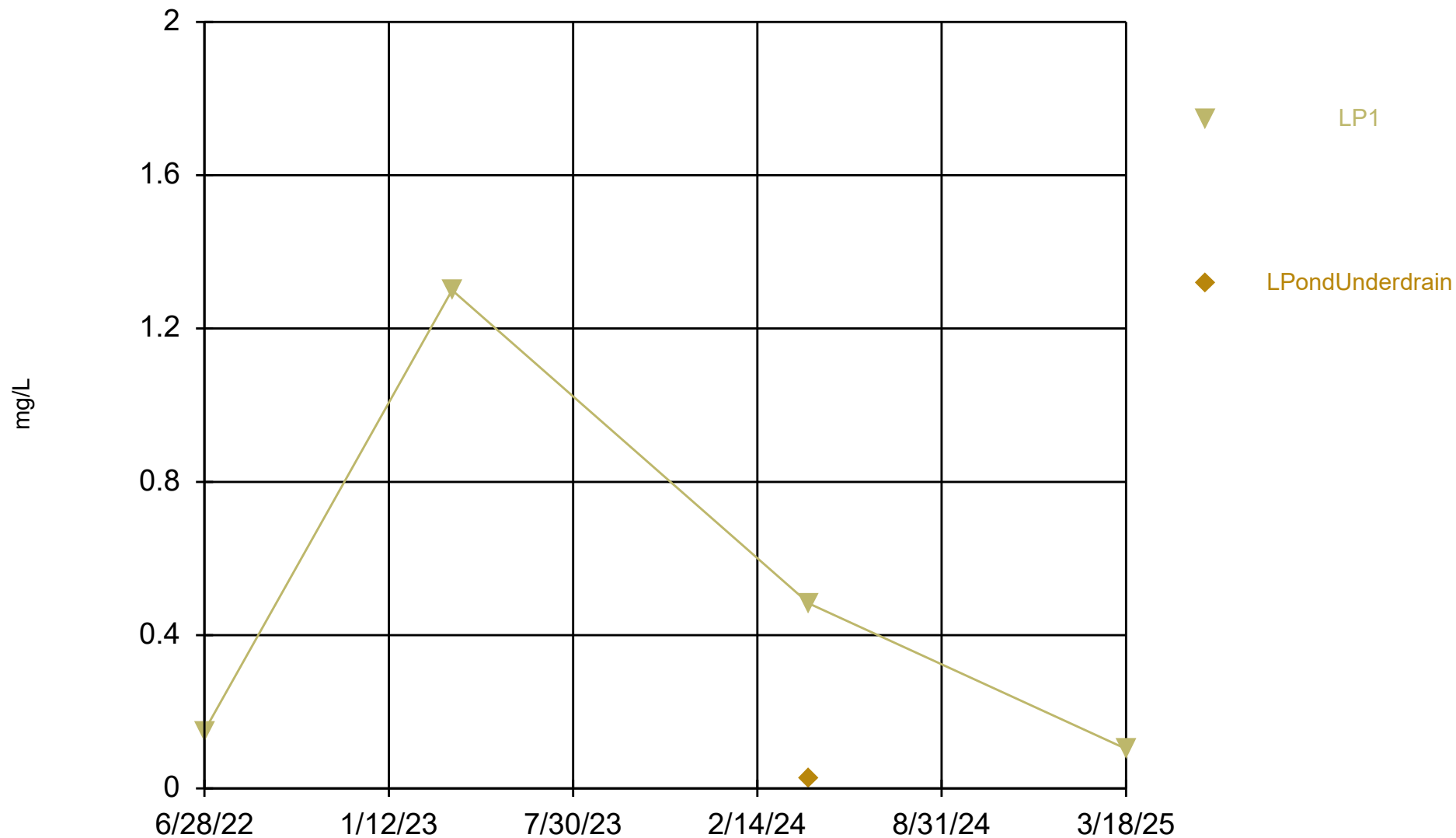
Constituent: Conductivity Analysis Run 3/12/2026 5:15 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



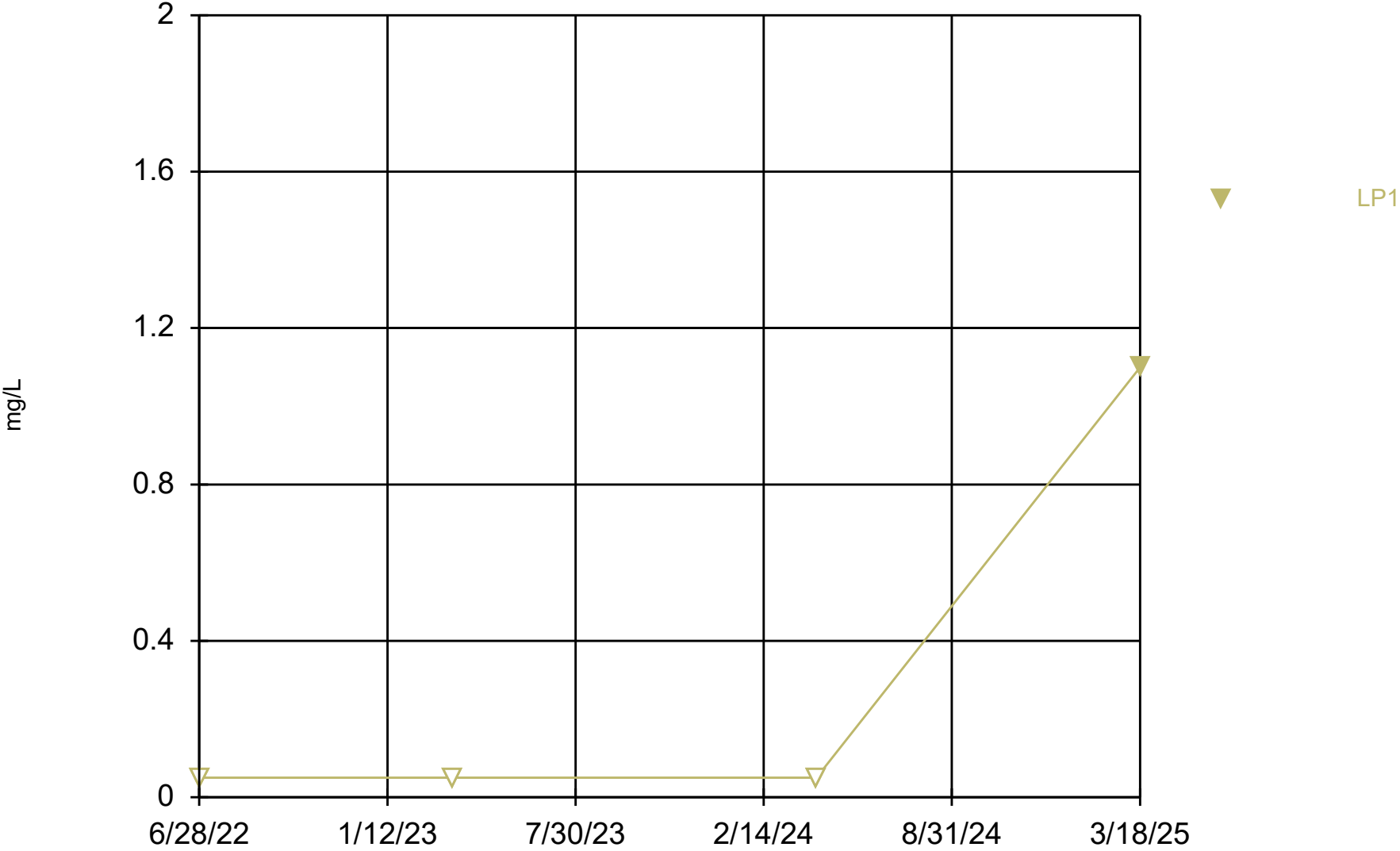
Constituent: Magnesium, Dissolved Analysis Run 3/12/2026 5:15 PM View: HRLF_TSP Set 1_Leachate O
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series

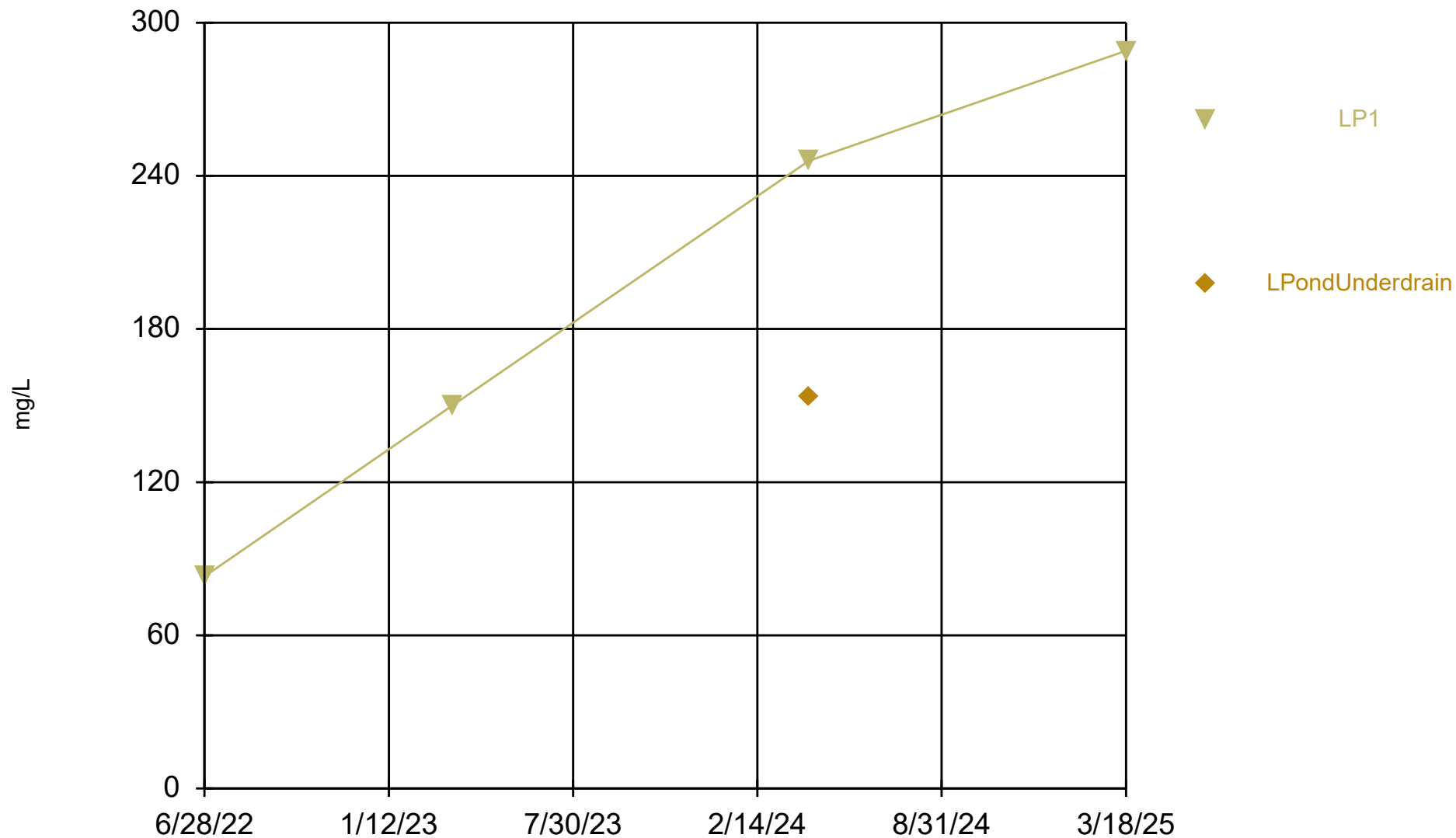


Constituent: Manganese, Dissolved Analysis Run 3/12/2026 5:15 PM View: HRLF_TSP Set 1_Leachate O
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series

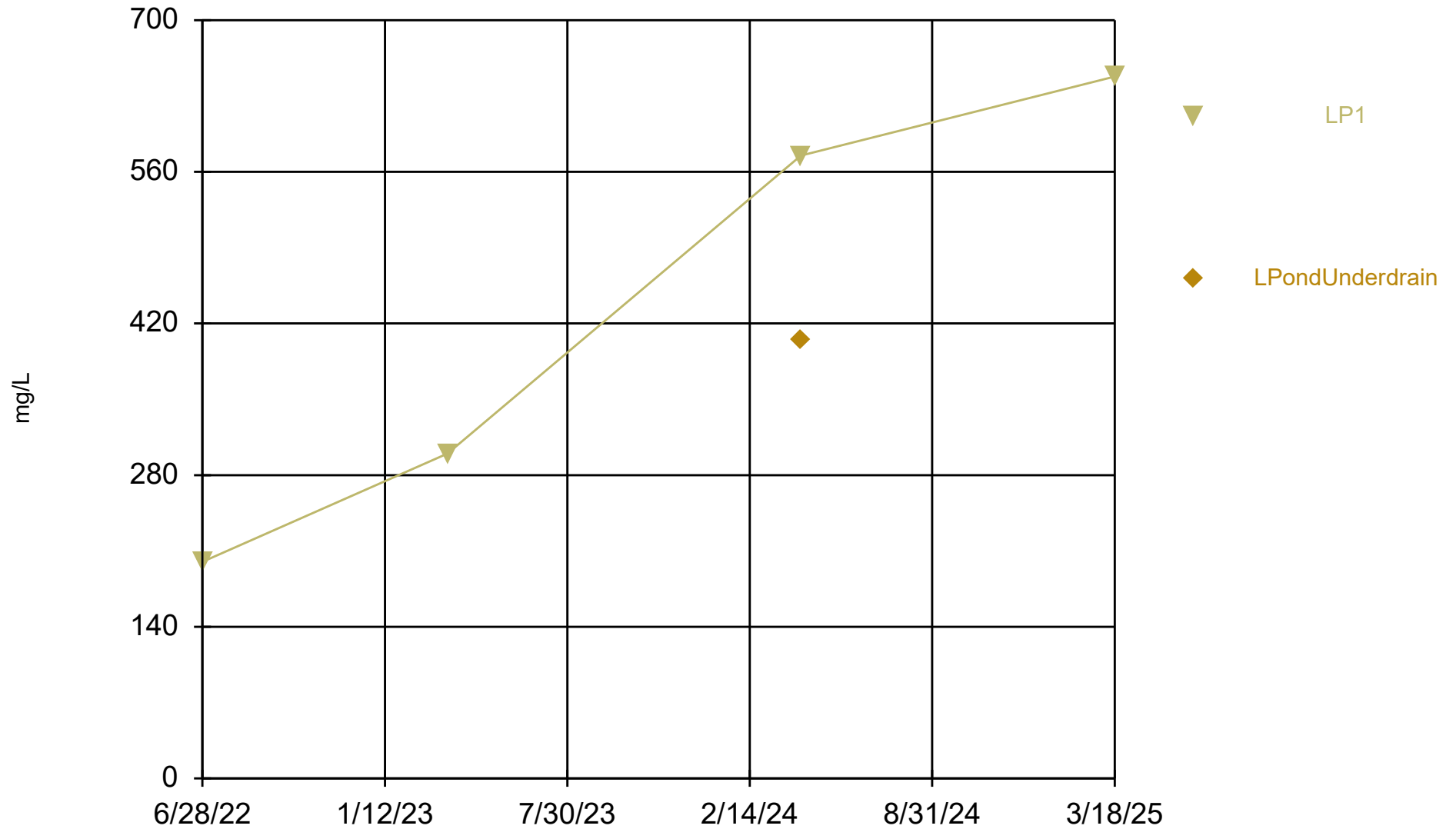


Time Series



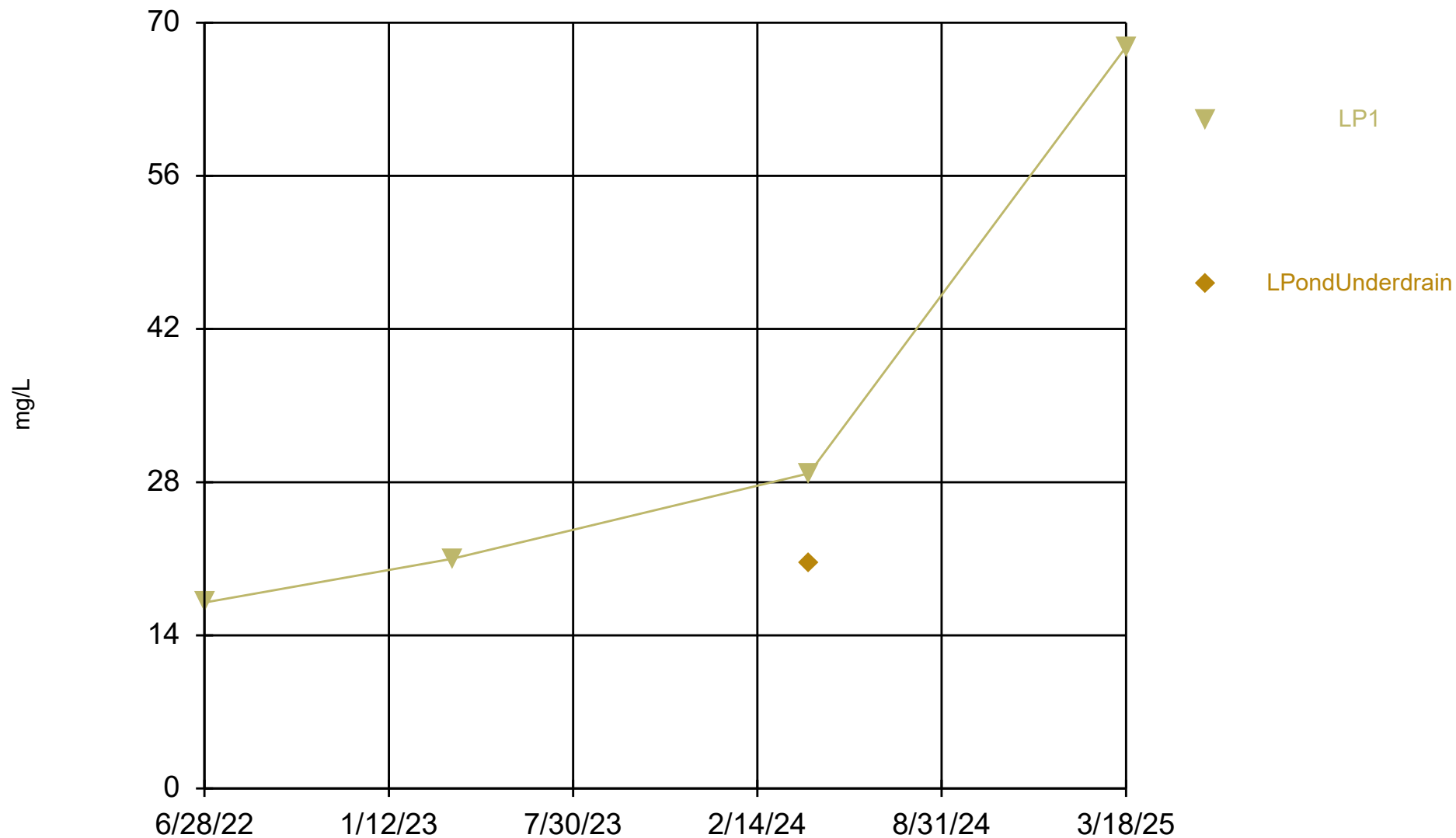
Constituent: Potassium, Dissolved Analysis Run 3/12/2026 5:15 PM View: HRLF_TSP Set 1_Leachate On
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



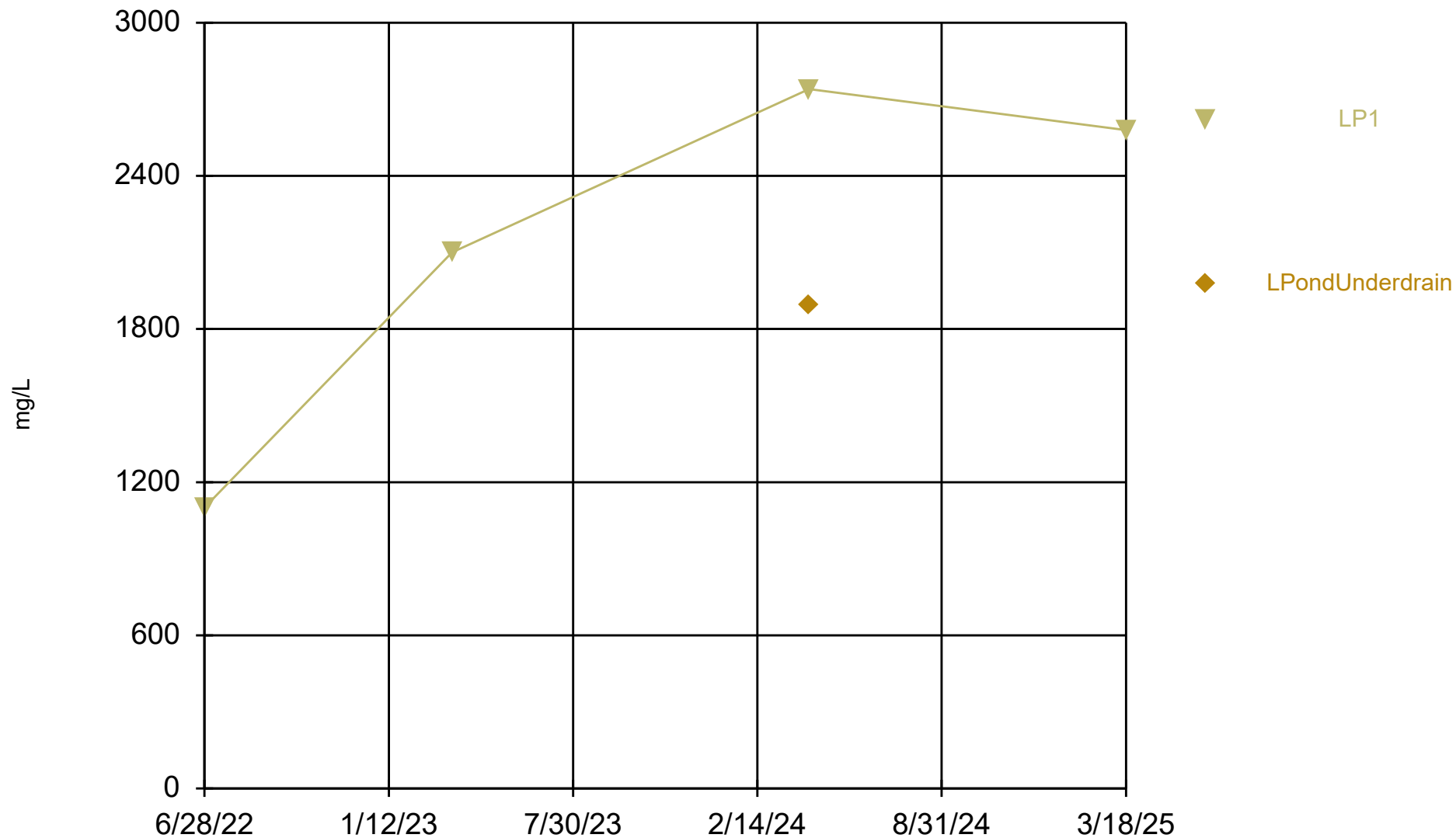
Constituent: Sodium, Dissolved Analysis Run 3/12/2026 5:15 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



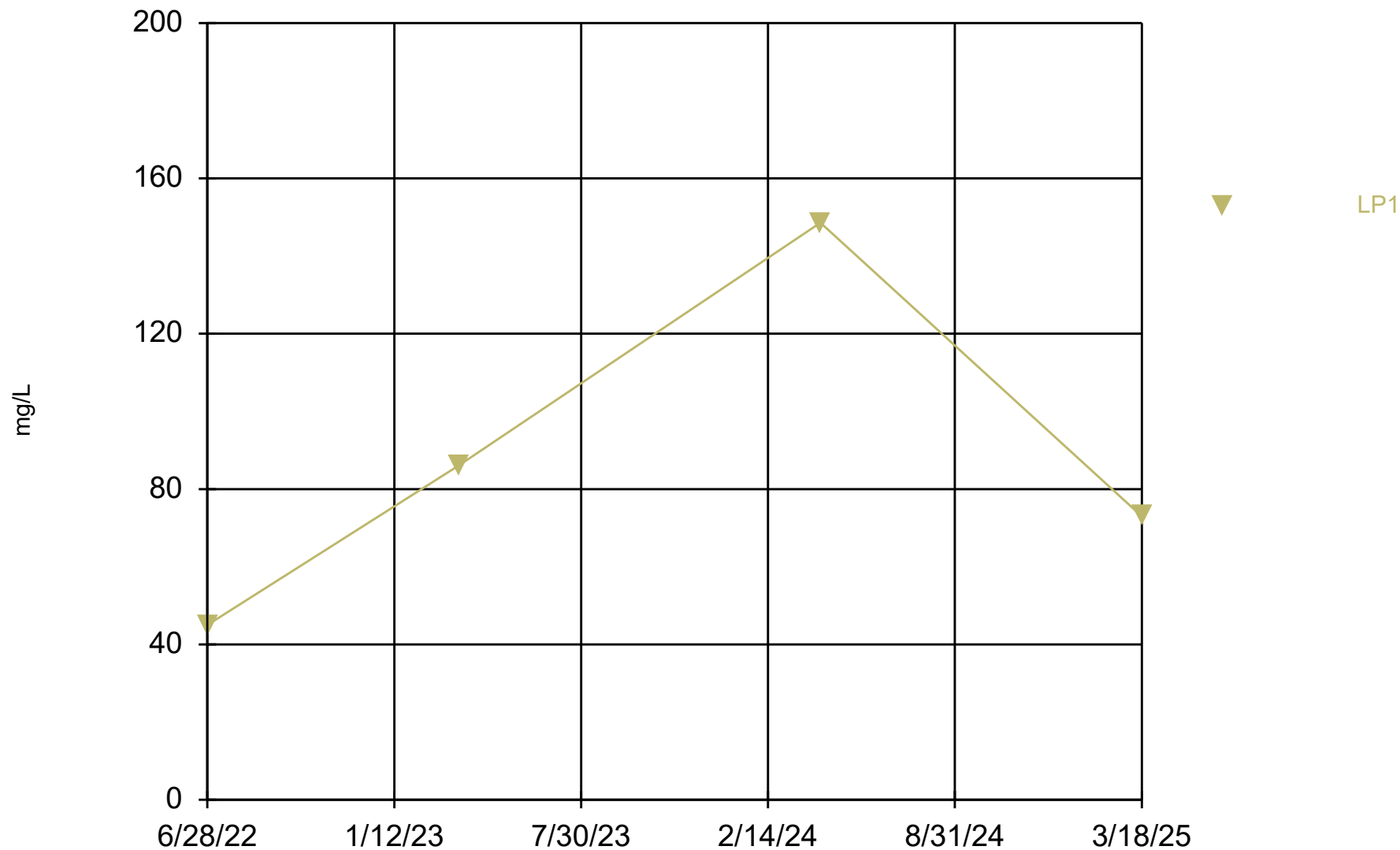
Constituent: Sulfate Analysis Run 3/12/2026 5:15 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: TDS Analysis Run 3/12/2026 5:15 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series

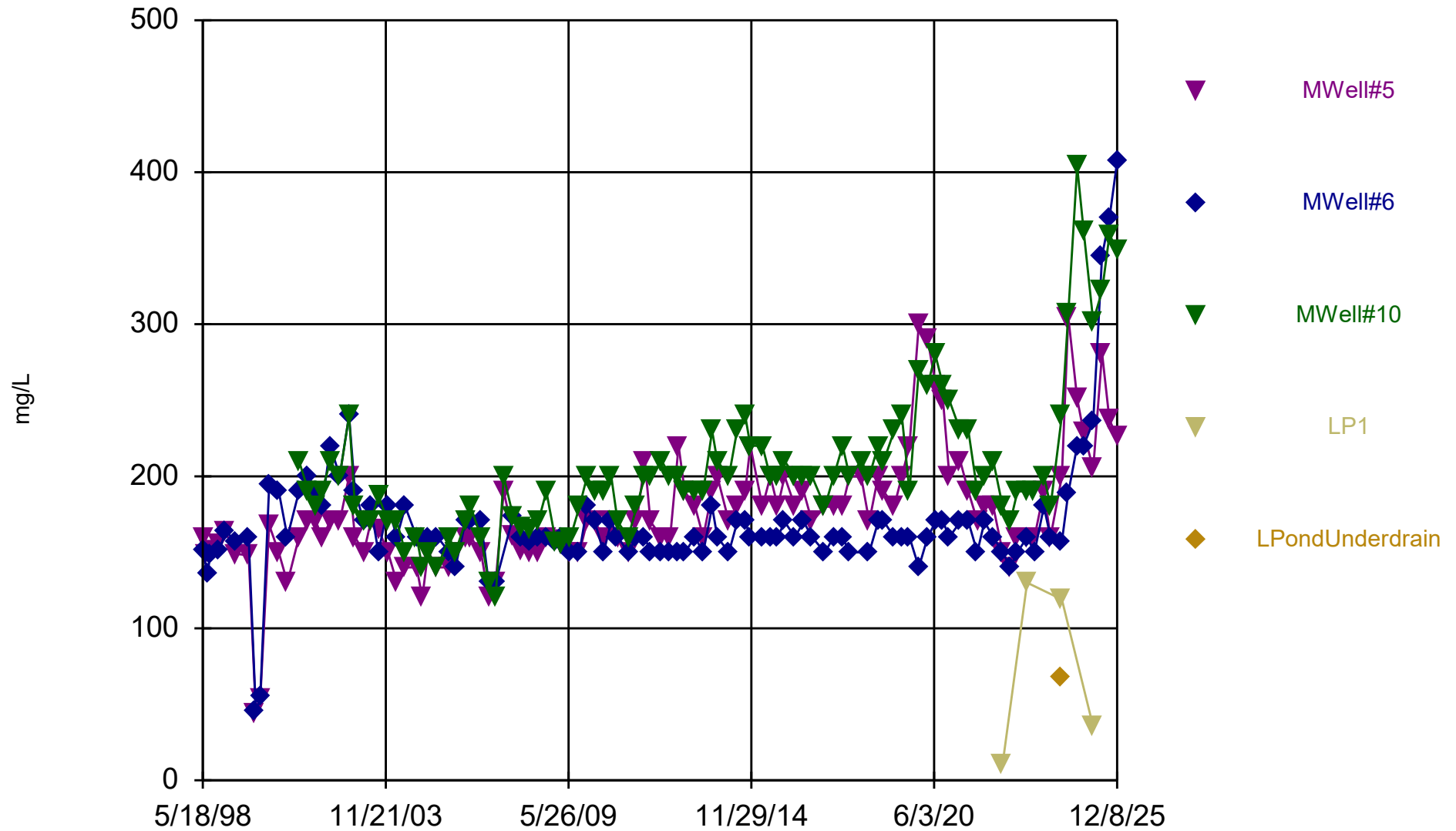


Constituent: TOC Analysis Run 3/12/2026 5:15 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

C-3

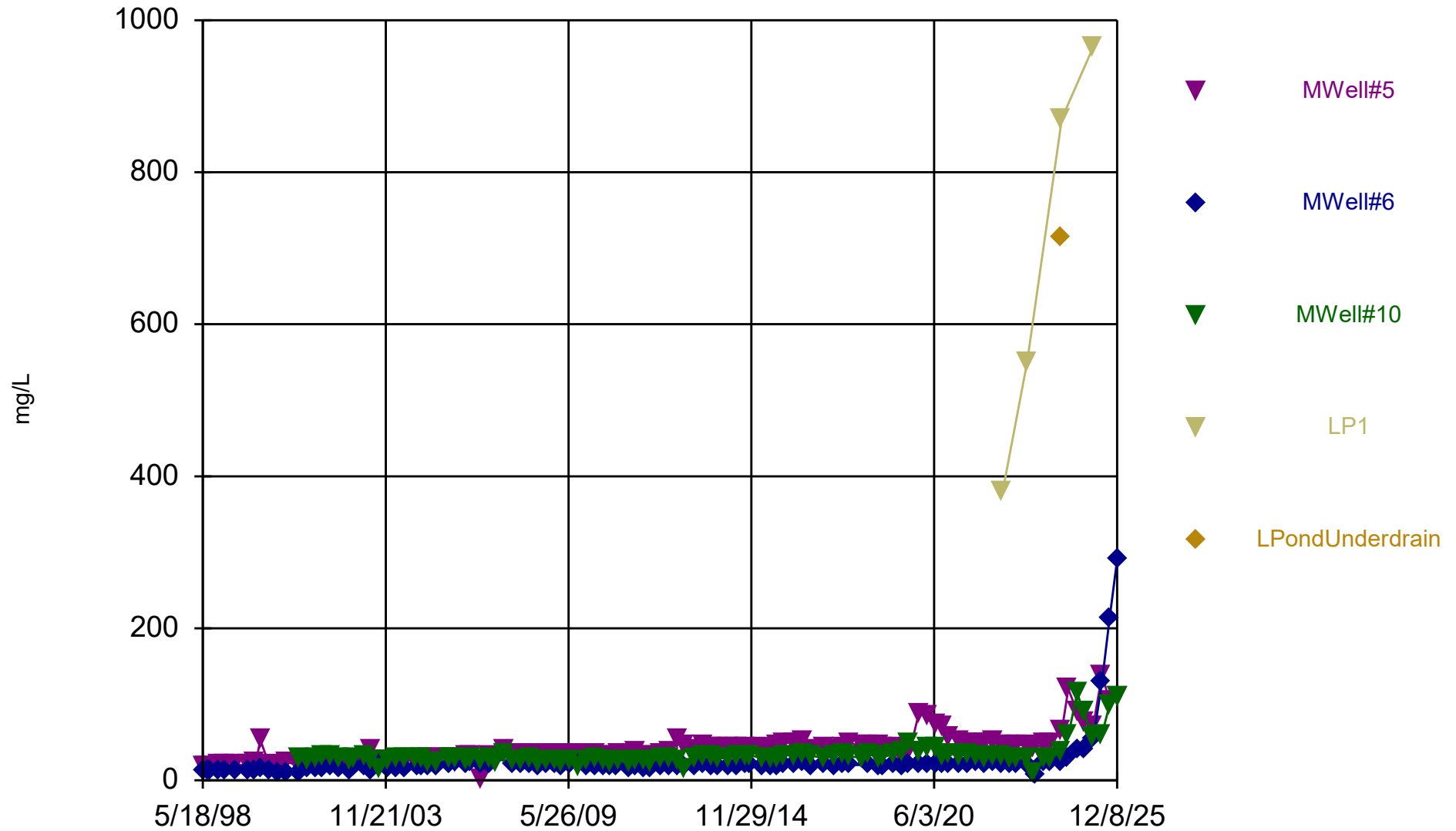
MW-5, MW-6, MW-10,
Leachate Pond and
Pond Underdrain

Time Series



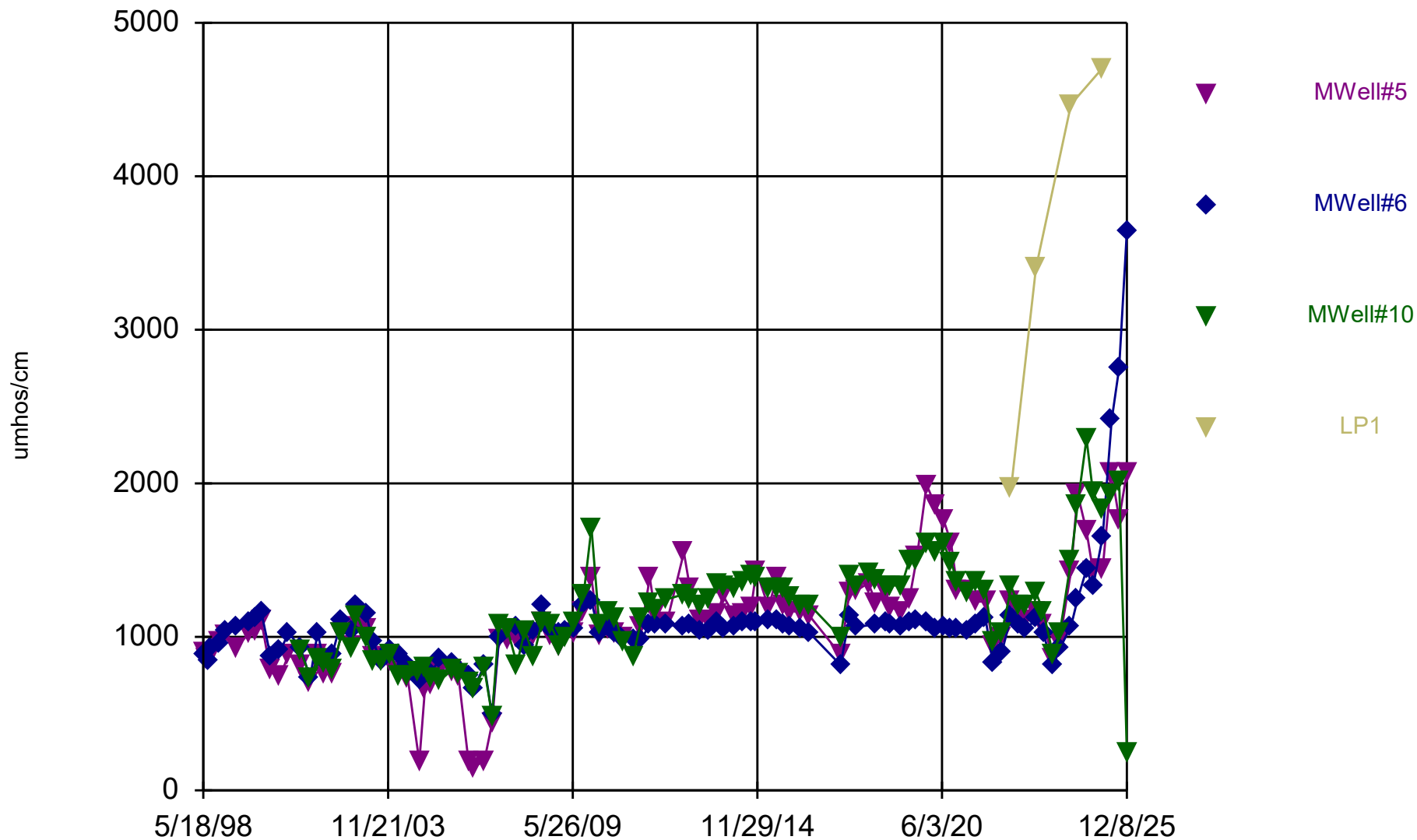
Constituent: Calcium, Dissolved Analysis Run 3/12/2026 5:17 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



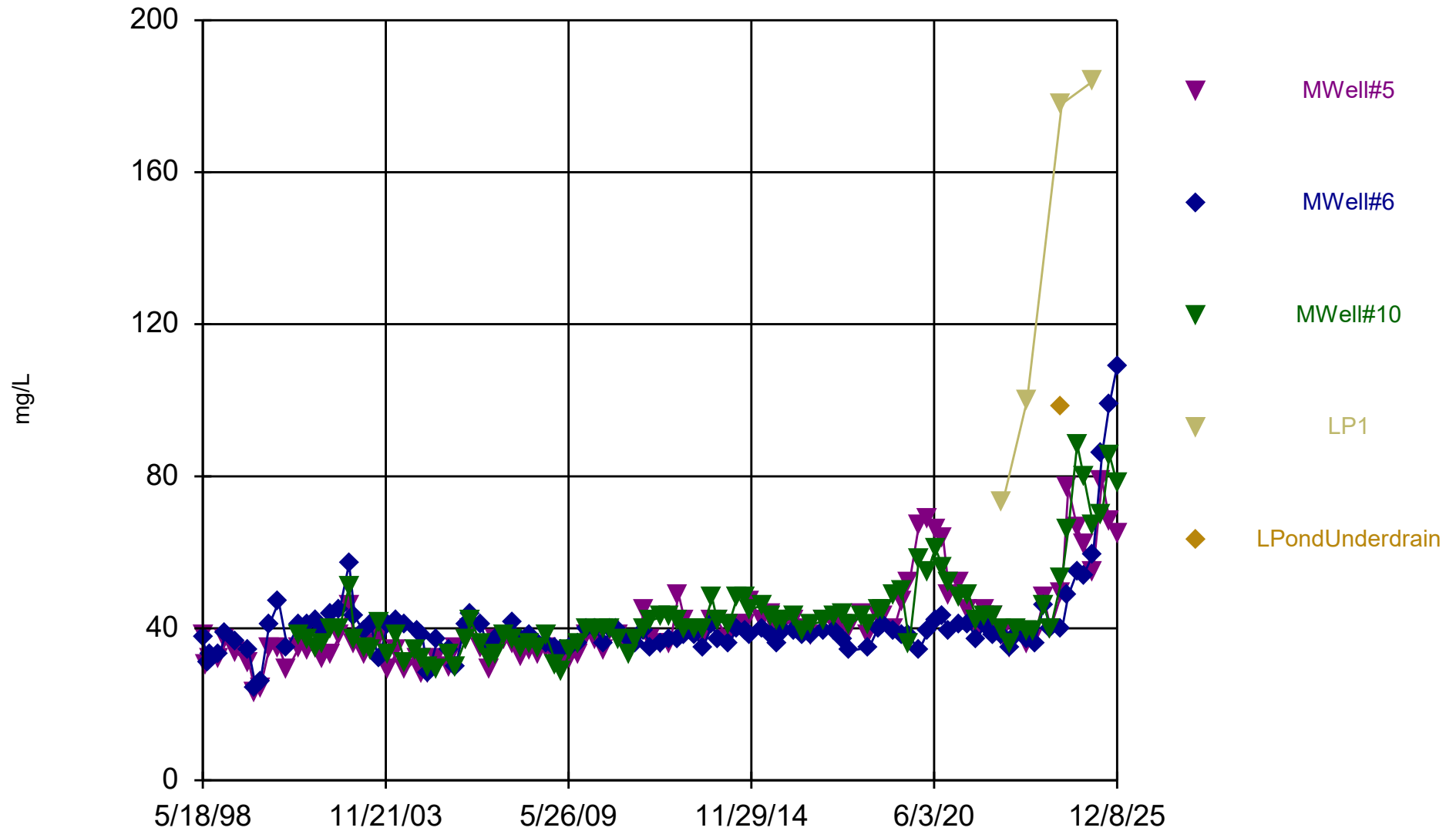
Constituent: Chloride Analysis Run 3/12/2026 5:17 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



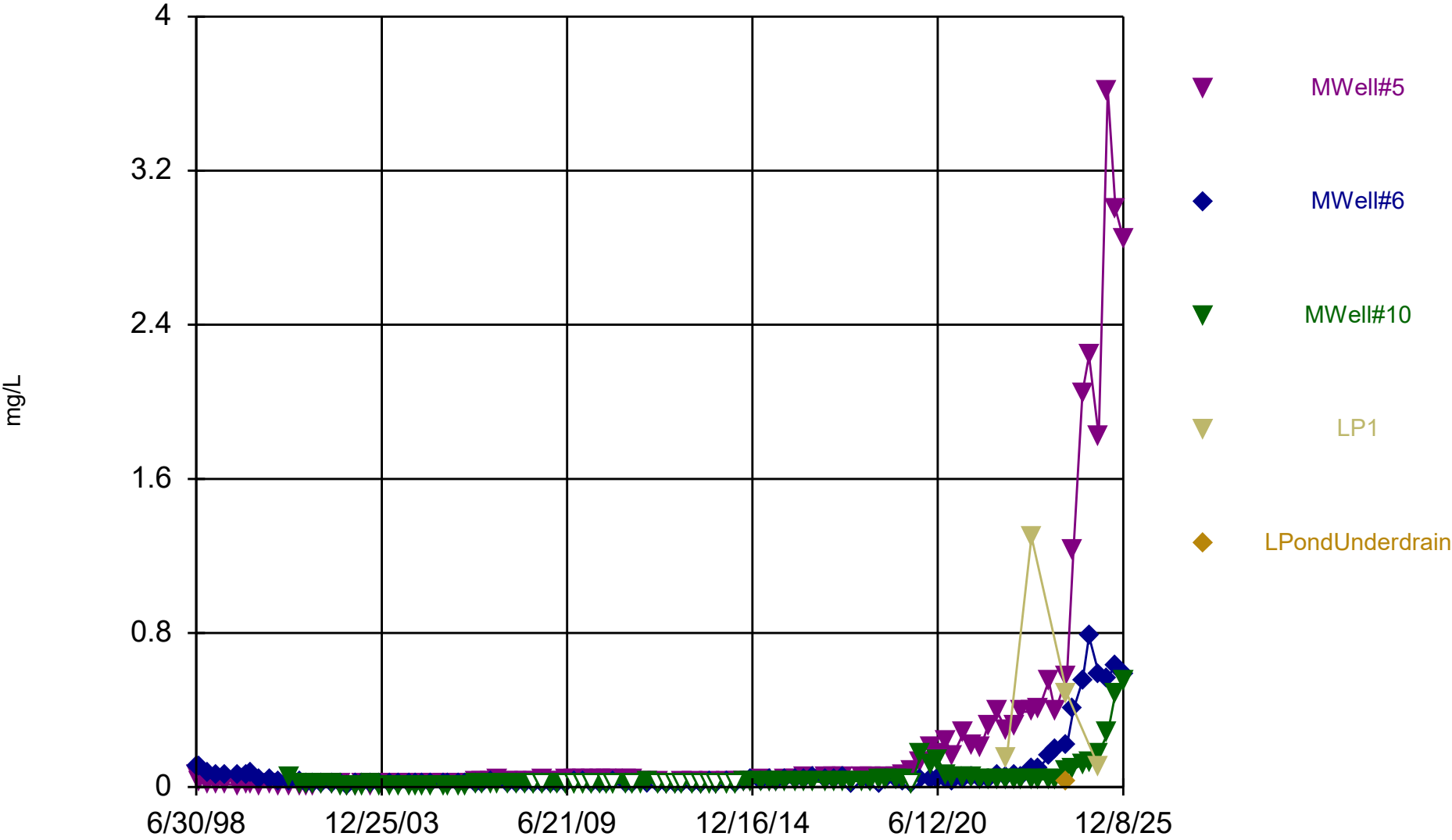
Constituent: Conductivity Analysis Run 3/12/2026 5:17 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series

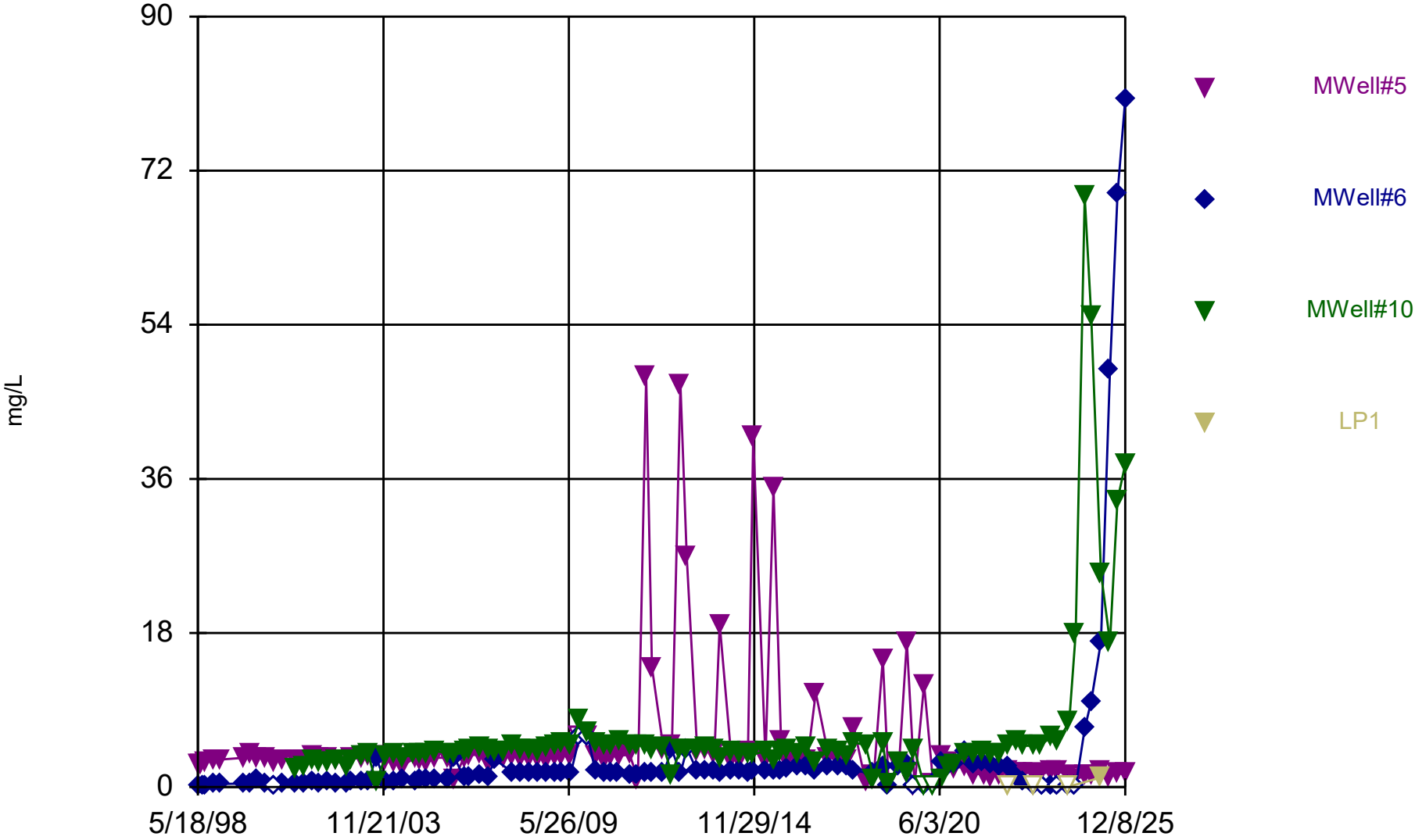


Constituent: Magnesium, Dissolved Analysis Run 3/12/2026 5:17 PM View: HRLF_TSP Set 1_Leachate O
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series

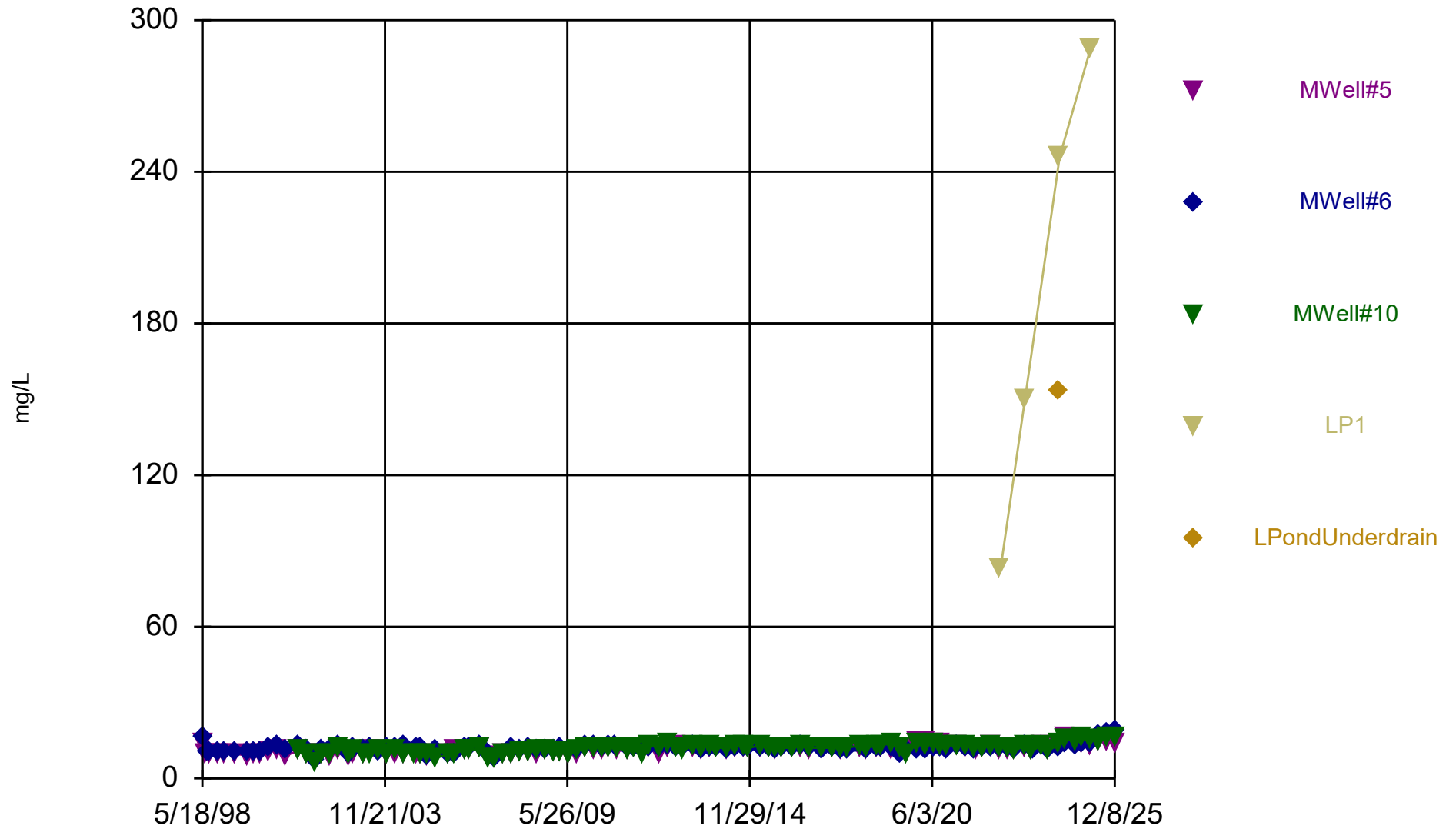


Time Series



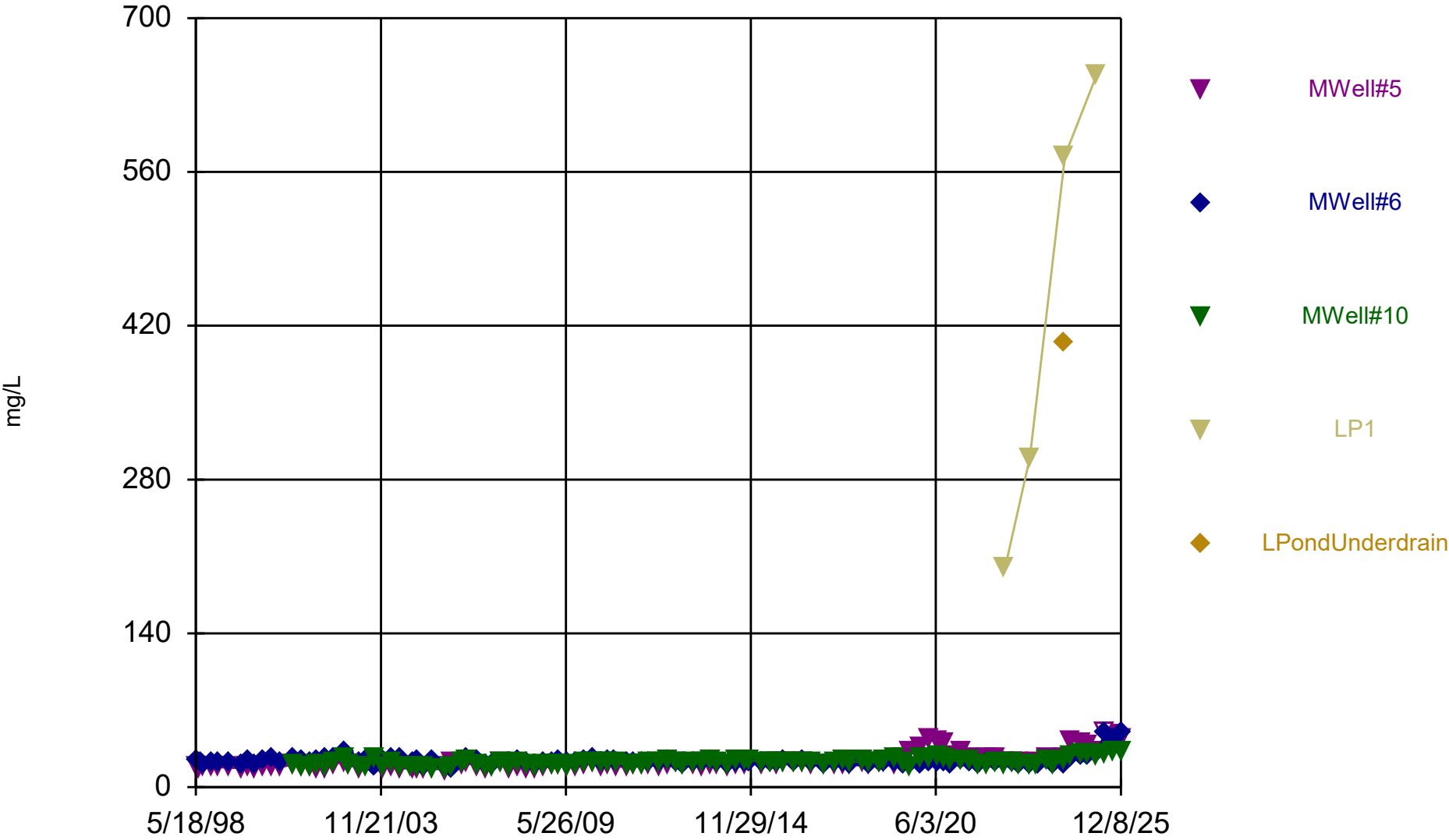
Constituent: Nitrate Nitrogen Analysis Run 3/12/2026 5:17 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series

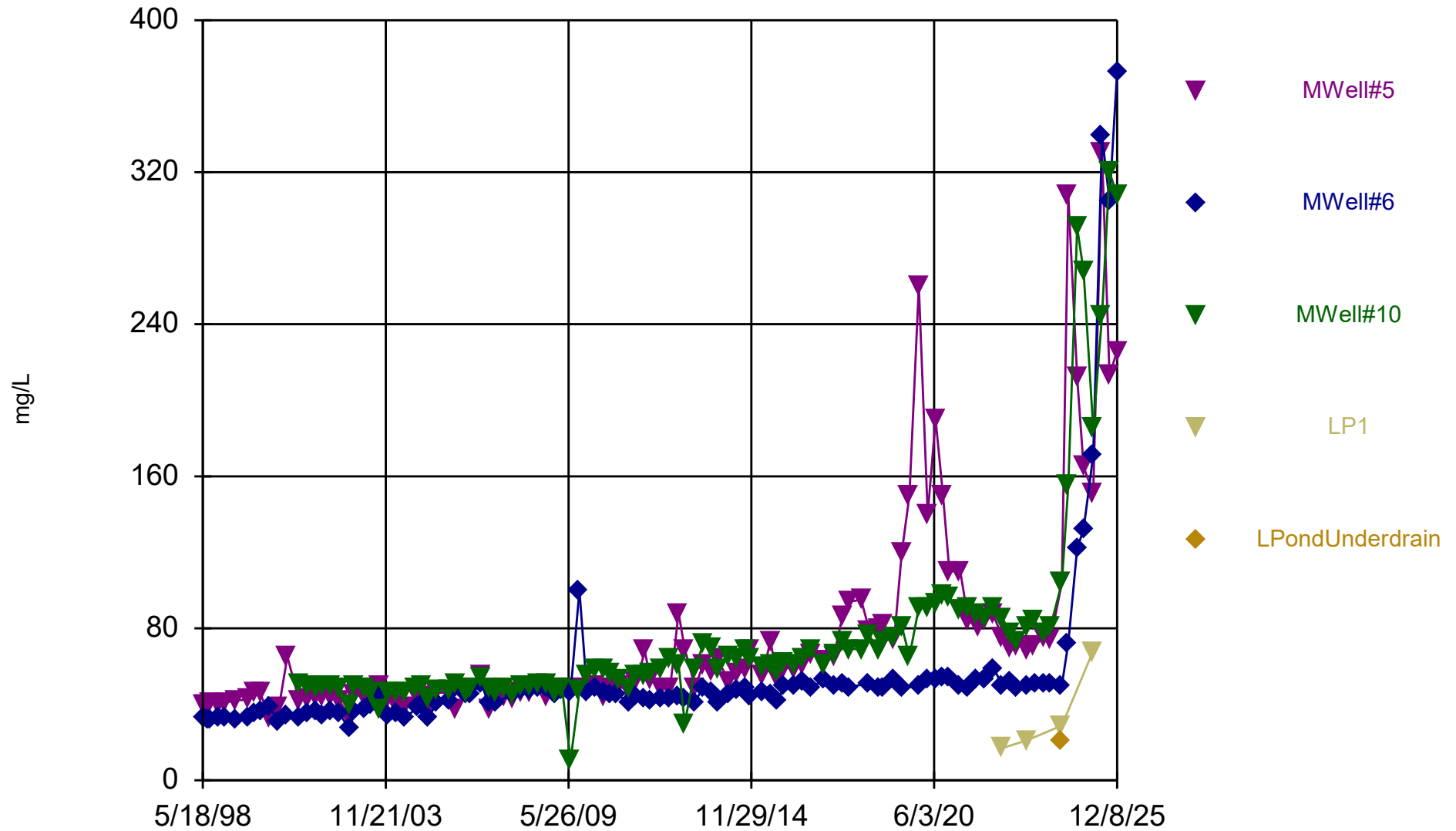


Constituent: Potassium, Dissolved Analysis Run 3/12/2026 5:17 PM View: HRLF_TSP Set 1_Leachate On
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series

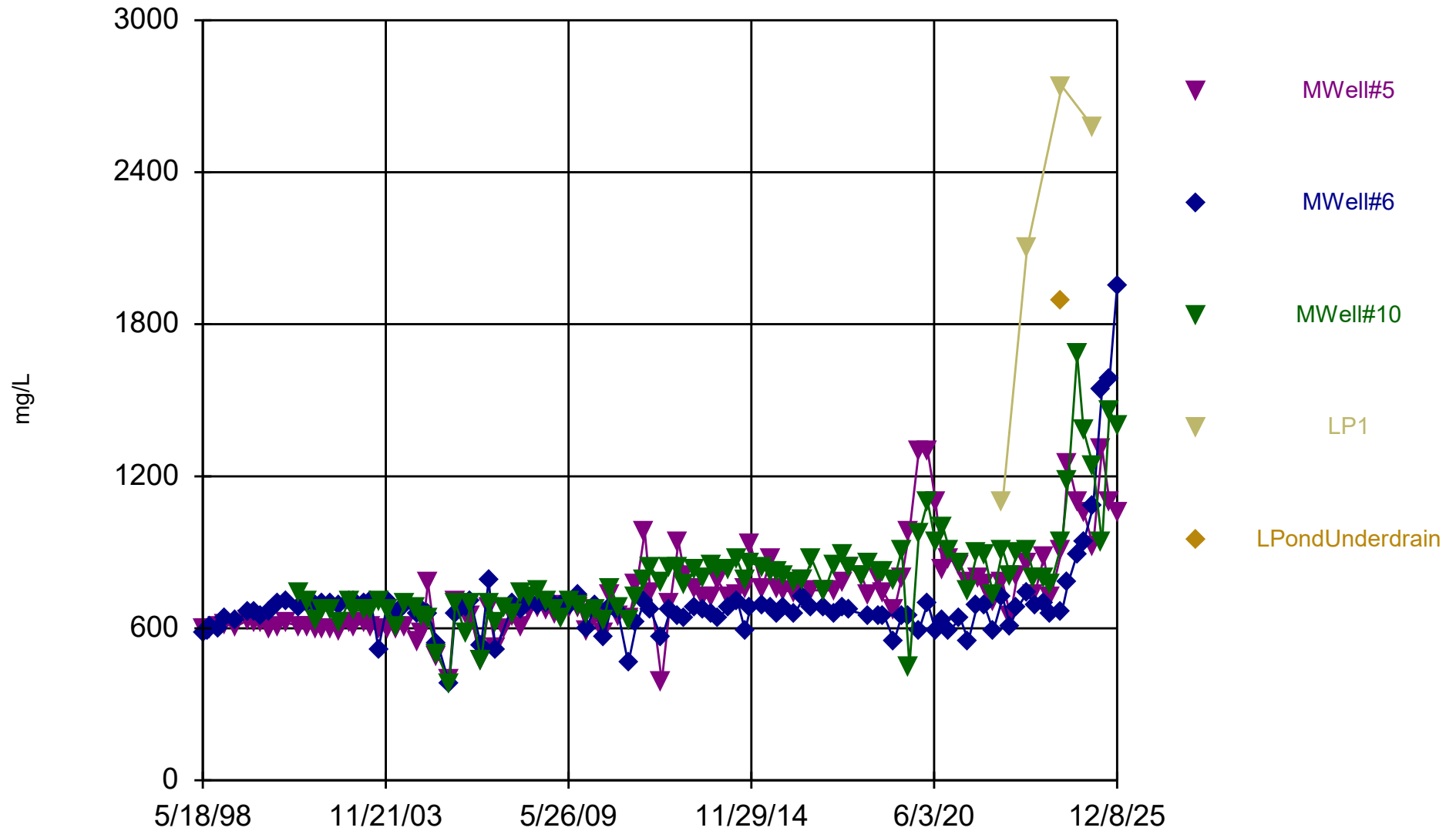


Time Series



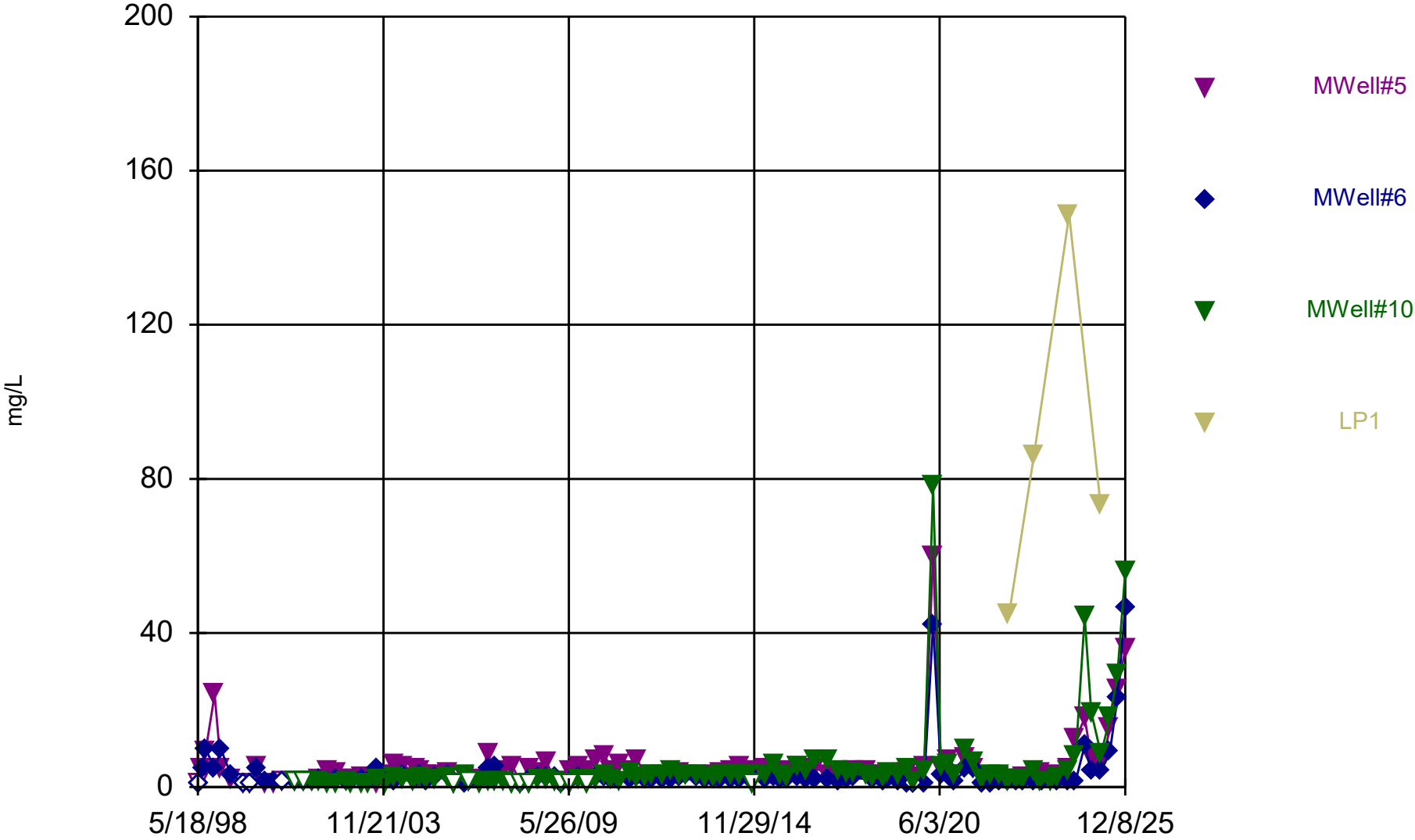
Constituent: Sulfate Analysis Run 3/12/2026 5:17 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: TDS Analysis Run 3/12/2026 5:17 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Time Series



Constituent: TOC Analysis Run 3/12/2026 5:17 PM View: HRLF_TSP Set 1_Leachate Only
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Appendix D

Sen's Slope/
Mann Kendall Tests

D-1

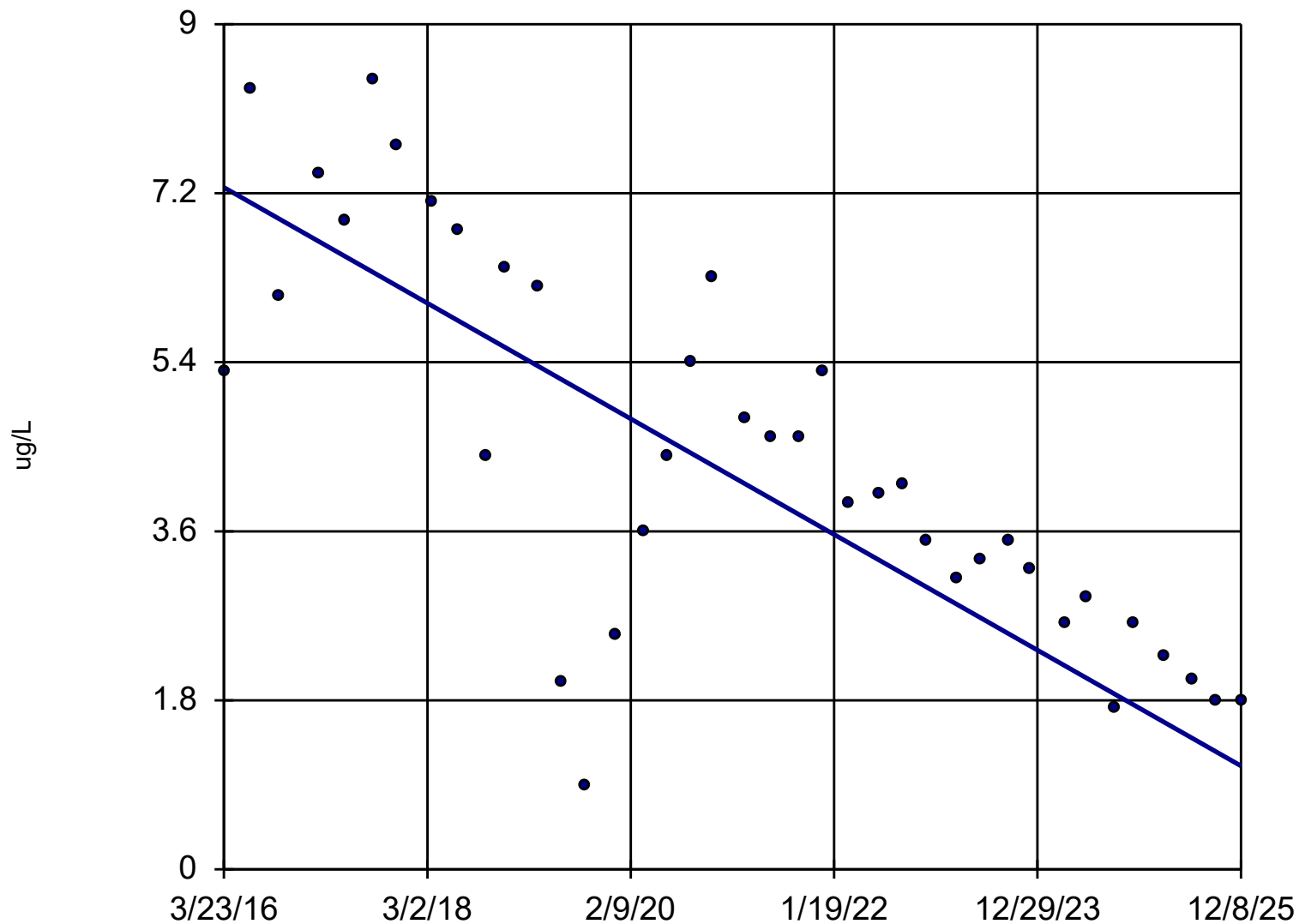
10-Year Trends

Horn Rapids Landfill Trends for Volatile Organic Compounds, First Quarter 2016 through Fourth Quarter 2025

Constituent Name	Well	Slope	Calculated Statistic	Critical Value	Trend	N	% Non-detects	Normality	Transformation	Alpha	Method
1,1-Dichloroethane (ug/L)	MWell#5	-0.6341	-464	-194	Yes	39	0	n/a	n/a	0.02	NP
1,1-Dichloroethane (ug/L)	MWell#6	-0.3939	-518	-186	Yes	38	0	n/a	n/a	0.02	NP
1,1-Dichloroethane (ug/L)	MWell#9	-0.223	-447	-194	Yes	39	0	n/a	n/a	0.02	NP
1,1-Dichloroethane (ug/L)	MWell#10	-0.6876	-546	-194	Yes	39	0	n/a	n/a	0.02	NP
1,2-Dichloroethane (ug/L)	MWell#5	-0.05264	-446	-194	Yes	39	7.692	n/a	n/a	0.02	NP
1,2-Dichloroethane (ug/L)	MWell#6	-0.03017	-429	-186	Yes	38	21.05	n/a	n/a	0.02	NP
1,2-Dichloroethane (ug/L)	MWell#10	-0.01567	-215	-194	Yes	39	2.564	n/a	n/a	0.02	NP
1,2-Dichloropropane (ug/L)	MWell#5	-0.0264	-408	-194	Yes	39	23.08	n/a	n/a	0.02	NP
1,2-Dichloropropane (ug/L)	MWell#6	-0.02384	-418	-186	Yes	38	28.95	n/a	n/a	0.02	NP
Benzene (ug/L)	MWell#6	-0.03011	-451	-186	Yes	38	18.42	n/a	n/a	0.02	NP
Chloroform (ug/L)	MWell#3	0.4326	312	171	Yes	36	0	n/a	n/a	0.02	NP
Chloroform (ug/L)	MWell#9	0.1146	313	194	Yes	39	12.82	n/a	n/a	0.02	NP
Chloroform (ug/L)	MWell#10	-0.04932	-426	-194	Yes	39	7.692	n/a	n/a	0.02	NP
cis-1,2-Dichloroethene (ug/L)	MWell#4	0.3337	465	194	Yes	39	0	n/a	n/a	0.02	NP
cis-1,2-Dichloroethene (ug/L)	MWell#5	-2.189	-385	-194	Yes	39	0	n/a	n/a	0.02	NP
cis-1,2-Dichloroethene (ug/L)	MWell#6	-4.365	-472	-186	Yes	38	0	n/a	n/a	0.02	NP
Tetrachloroethene (ug/L)	MWell#1	0.1274	207	194	Yes	39	0	n/a	n/a	0.02	NP
Tetrachloroethene (ug/L)	MWell#5	-0.534	-230	-194	Yes	39	0	n/a	n/a	0.02	NP
Tetrachloroethene (ug/L)	MWell#6	-2.16	-433	-186	Yes	38	0	n/a	n/a	0.02	NP
Tetrachloroethene (ug/L)	MWell#10	-0.1731	-238	-194	Yes	39	0	n/a	n/a	0.02	NP
trans-1,2-Dichloroethene (ug/L)	MWell#5	-0.03905	-349	-194	Yes	39	17.95	n/a	n/a	0.02	NP
trans-1,2-Dichloroethene (ug/L)	MWell#6	-0.1629	-541	-186	Yes	38	15.79	n/a	n/a	0.02	NP
Trichloroethene (ug/L)	MWell#4	0.07397	523	194	Yes	39	23.08	n/a	n/a	0.02	NP
Trichloroethene (ug/L)	MWell#5	-0.2622	-307	-194	Yes	39	0	n/a	n/a	0.02	NP
Trichloroethene (ug/L)	MWell#6	-1.069	-476	-186	Yes	38	0	n/a	n/a	0.02	NP
Vinyl Chloride (ug/L)	MWell#5	-0.3971	-383	-194	Yes	39	2.564	n/a	n/a	0.02	NP
Vinyl Chloride (ug/L)	MWell#6	-0.3346	-450	-186	Yes	38	23.68	n/a	n/a	0.02	NP
Vinyl Chloride (ug/L)	MWell#10	-0.05214	-371	-194	Yes	39	15.38	n/a	n/a	0.02	NP

Sen's Slope Estimator

MWell#5



n = 39

Slope = -0.6341
units per year.

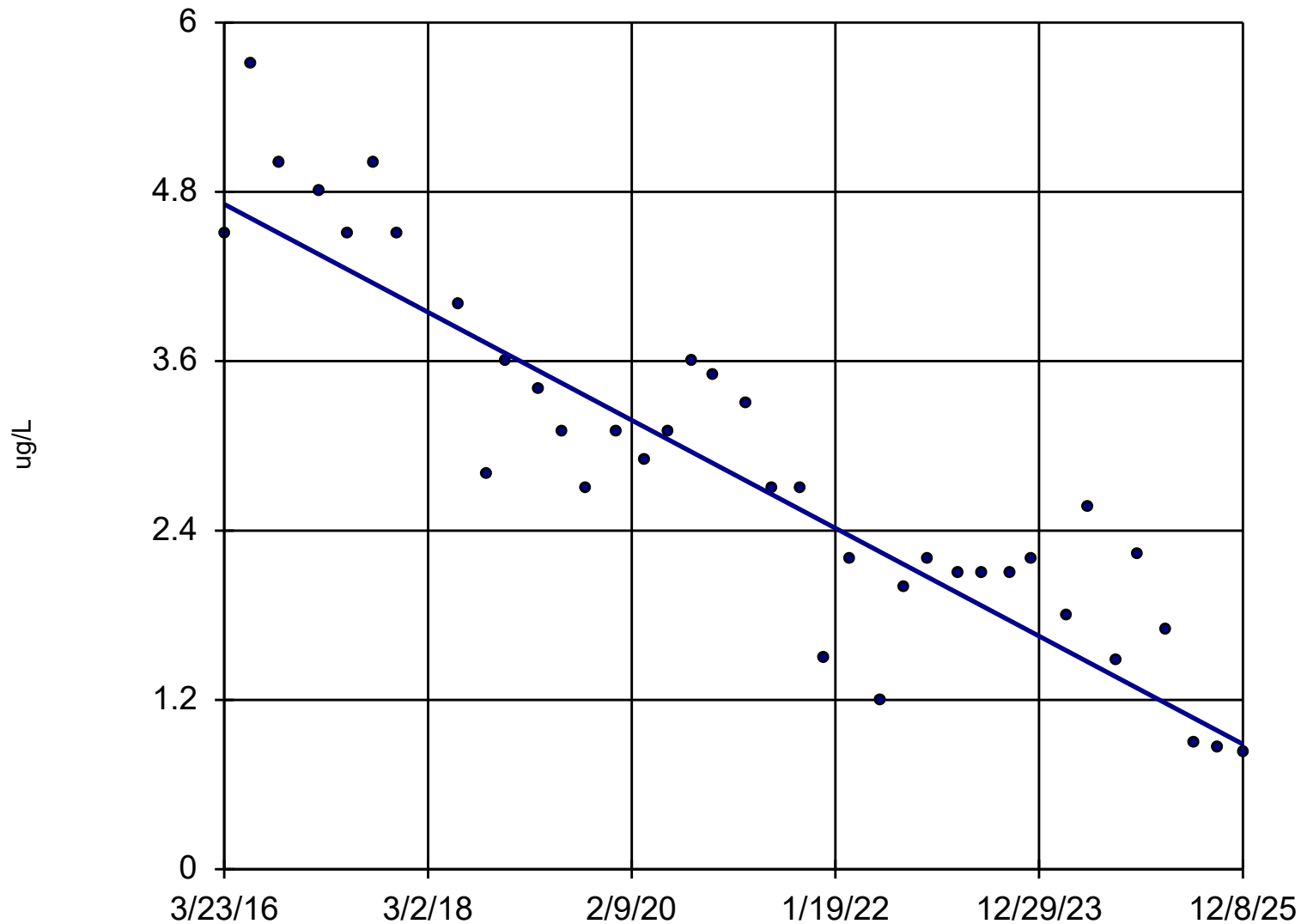
Mann-Kendall
statistic = -464
critical = -194

Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: 1,1-Dichloroethane Analysis Run 2/13/2026 4:22 PM View: 10 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWell#6



n = 38

Slope = -0.3939
units per year.

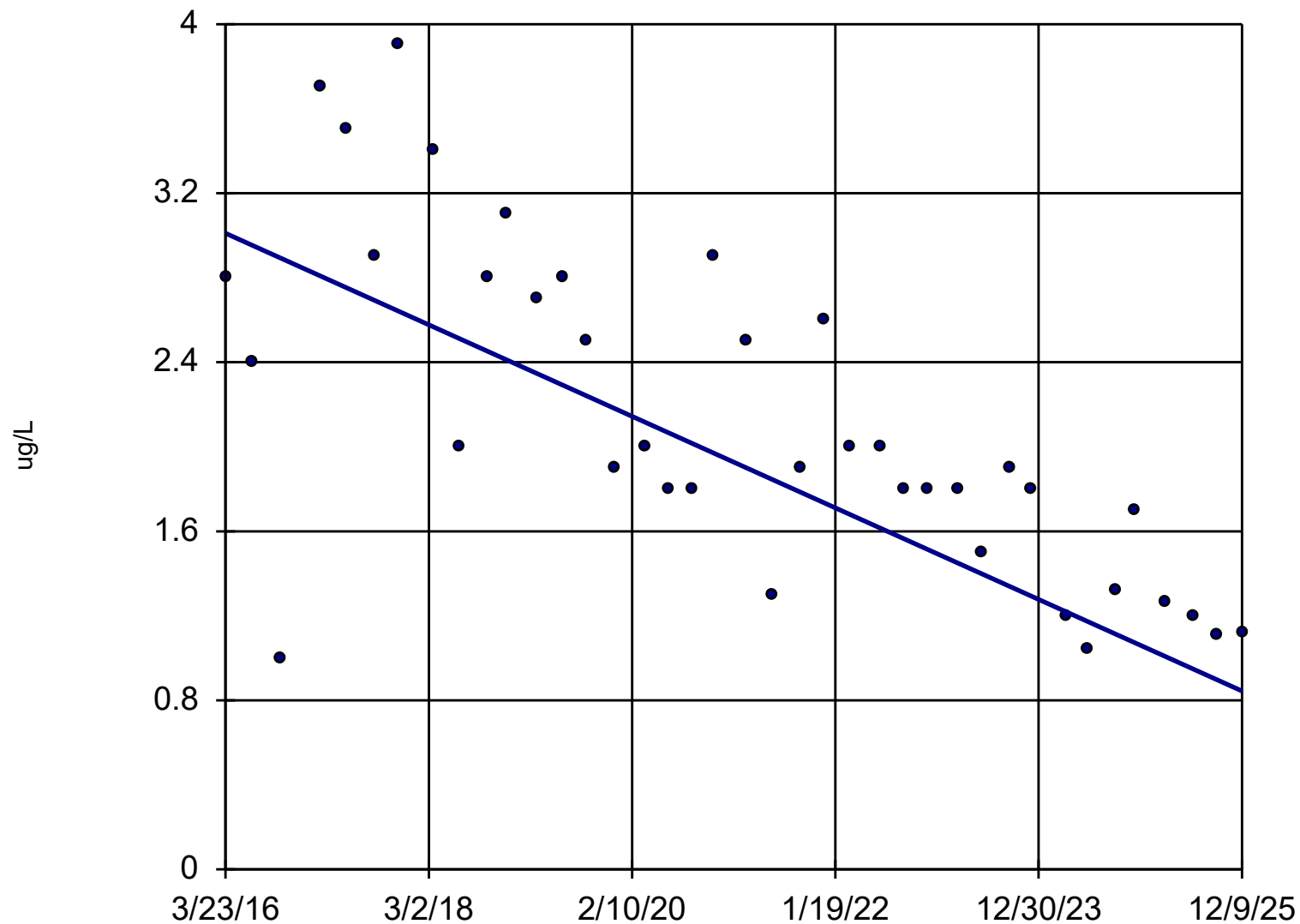
Mann-Kendall
statistic = -518
critical = -186

Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: 1,1-Dichloroethane Analysis Run 2/13/2026 4:22 PM View: 10 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWell#9



n = 39

Slope = -0.223
units per year.

Mann-Kendall
statistic = -447
critical = -194

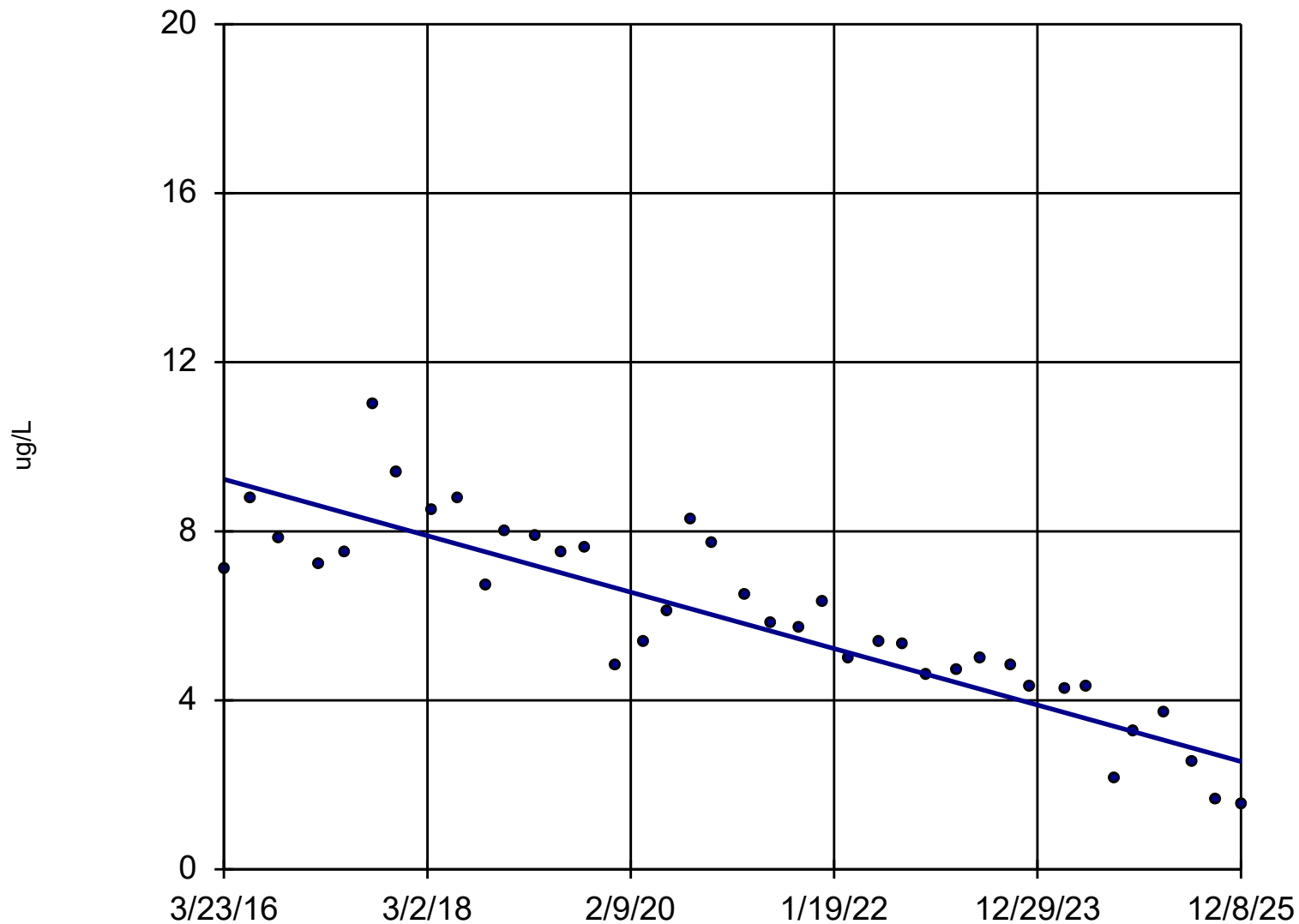
Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: 1,1-Dichloroethane Analysis Run 2/13/2026 4:22 PM View: 10 yr trend_part 2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

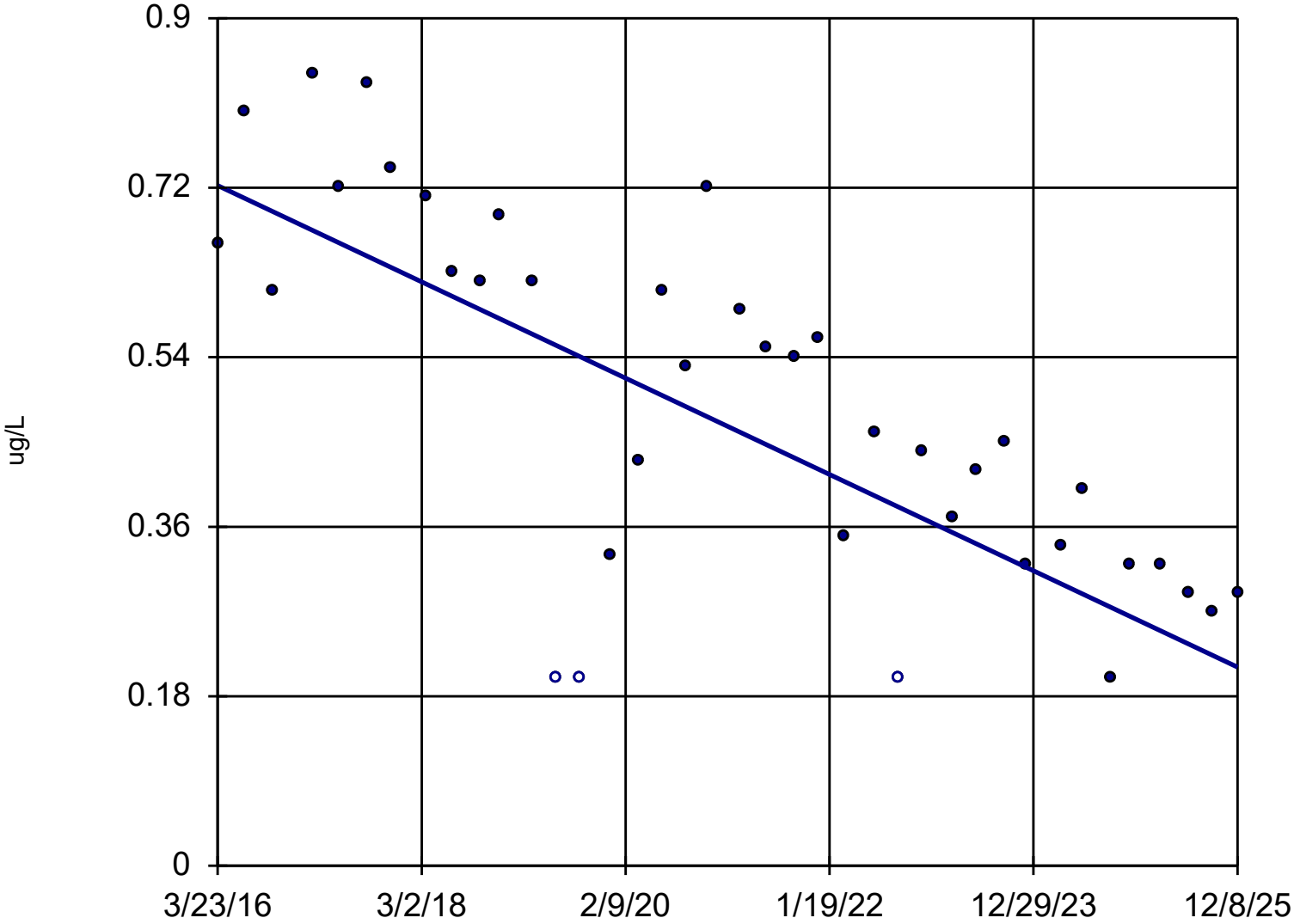
Sen's Slope Estimator

MWell#10



Sen's Slope Estimator

MWell#5



n = 39

Slope = -0.05264
units per year.

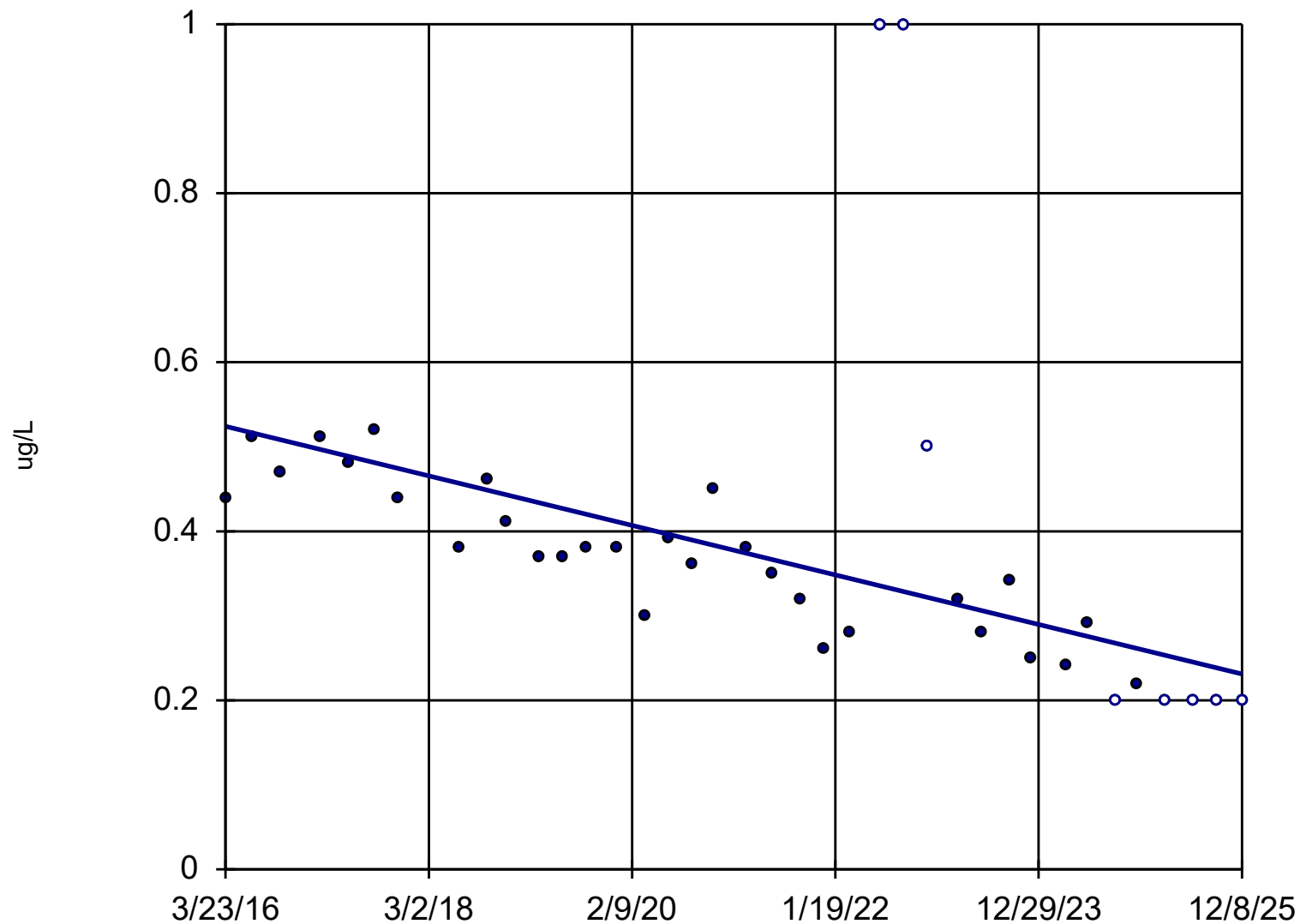
Mann-Kendall
statistic = -446
critical = -194

Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: 1,2-Dichloroethane Analysis Run 2/13/2026 4:22 PM View: 10 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWWell#6



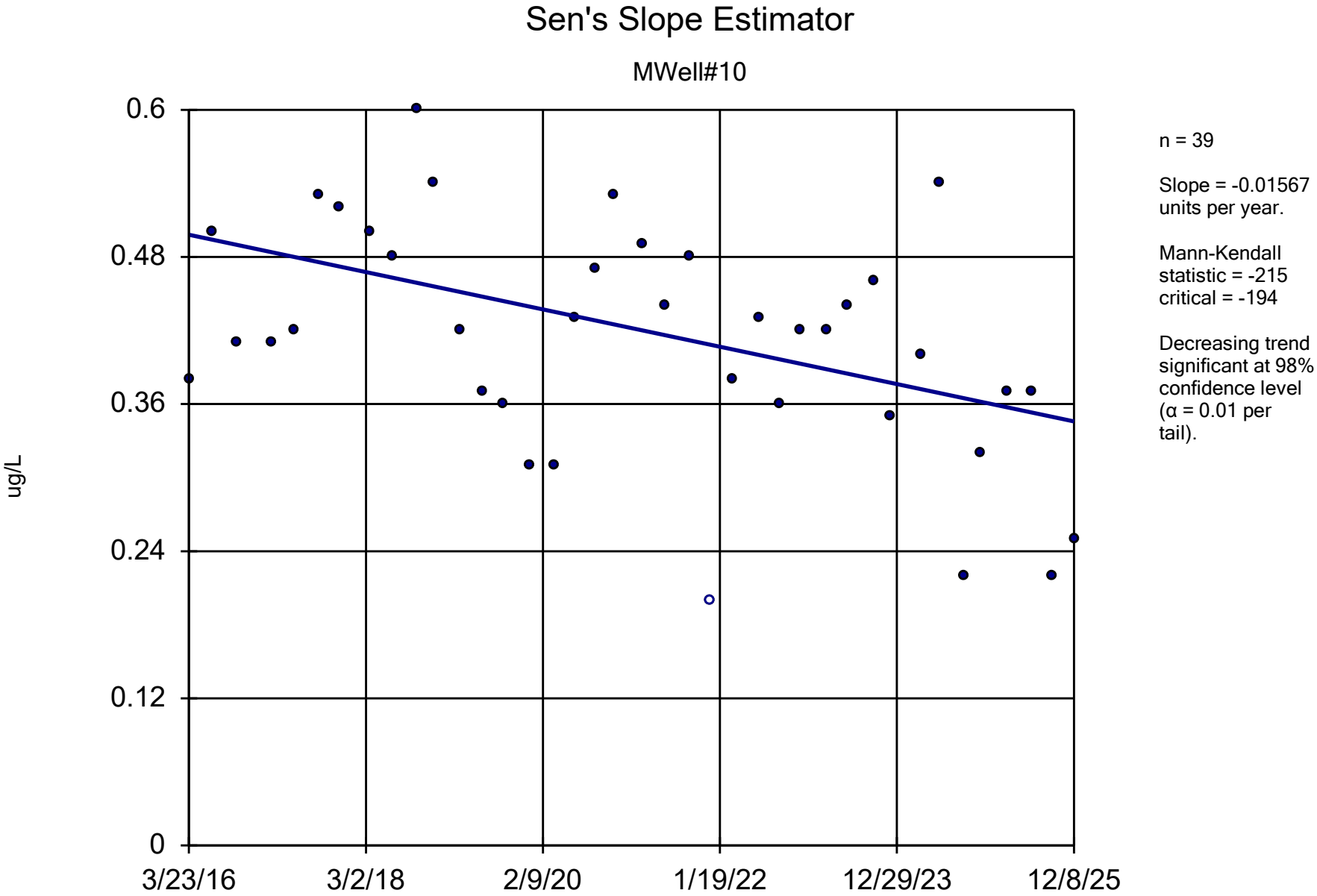
n = 38

Slope = -0.03017
units per year.

Mann-Kendall
statistic = -429
critical = -186

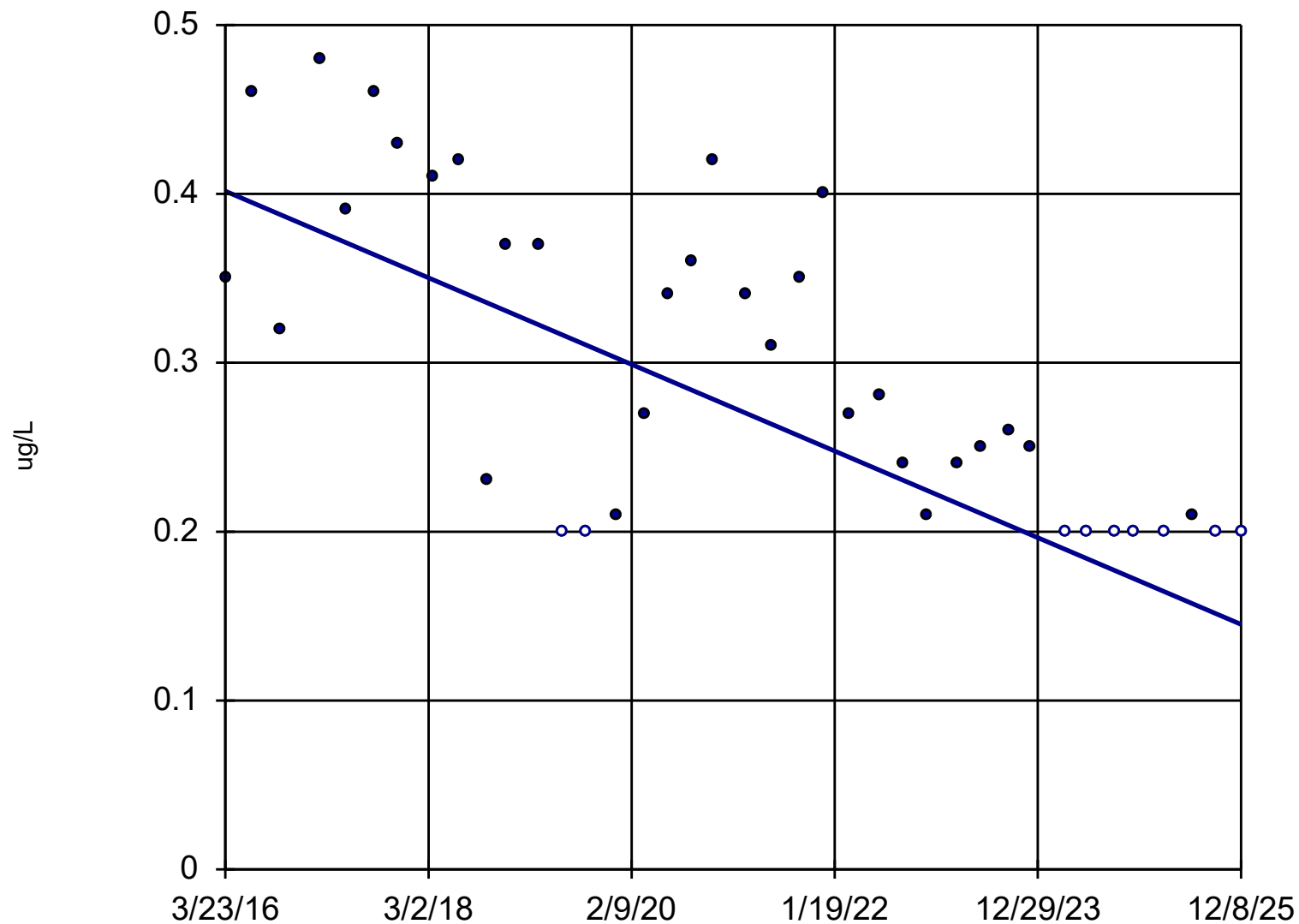
Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: 1,2-Dichloroethane Analysis Run 2/13/2026 4:22 PM View: 10 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata



Sen's Slope Estimator

MWell#5



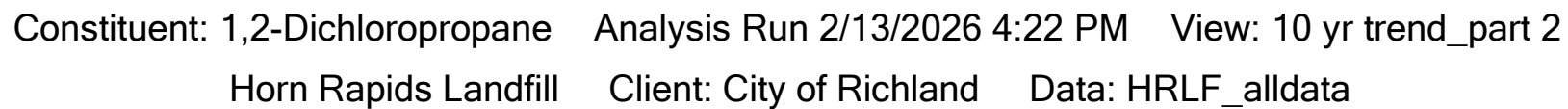
n = 39

Slope = -0.0264
units per year.

Mann-Kendall
statistic = -408
critical = -194

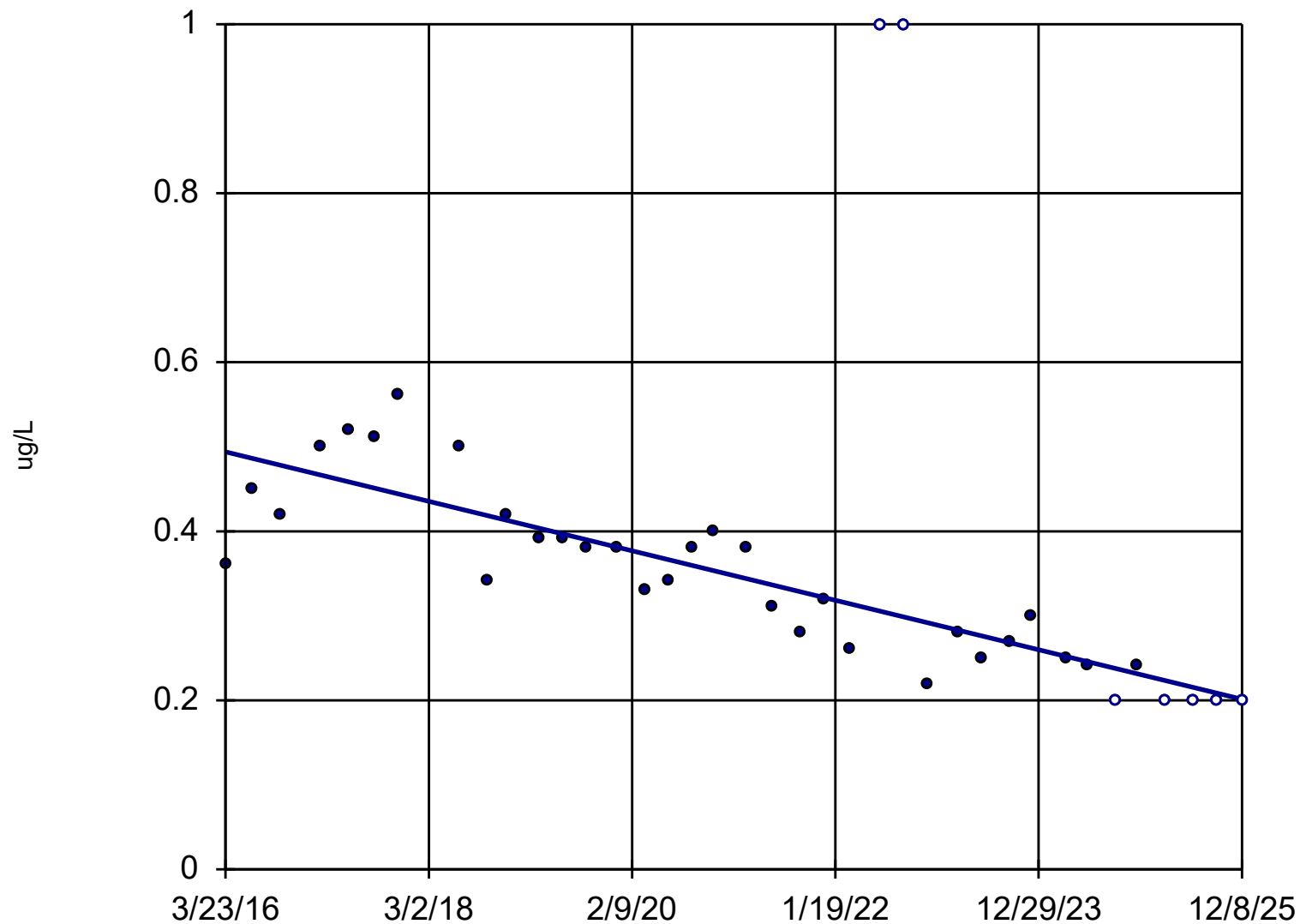
Decreasing trend significant at 98% confidence level ($\alpha = 0.01$ per tail).

Constituent: 1,2-Dichloropropane Analysis Run 2/13/2026 4:22 PM View: 10 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata



Sen's Slope Estimator

MWell#6



n = 38

Slope = -0.03011
units per year.

Mann-Kendall
statistic = -451
critical = -186

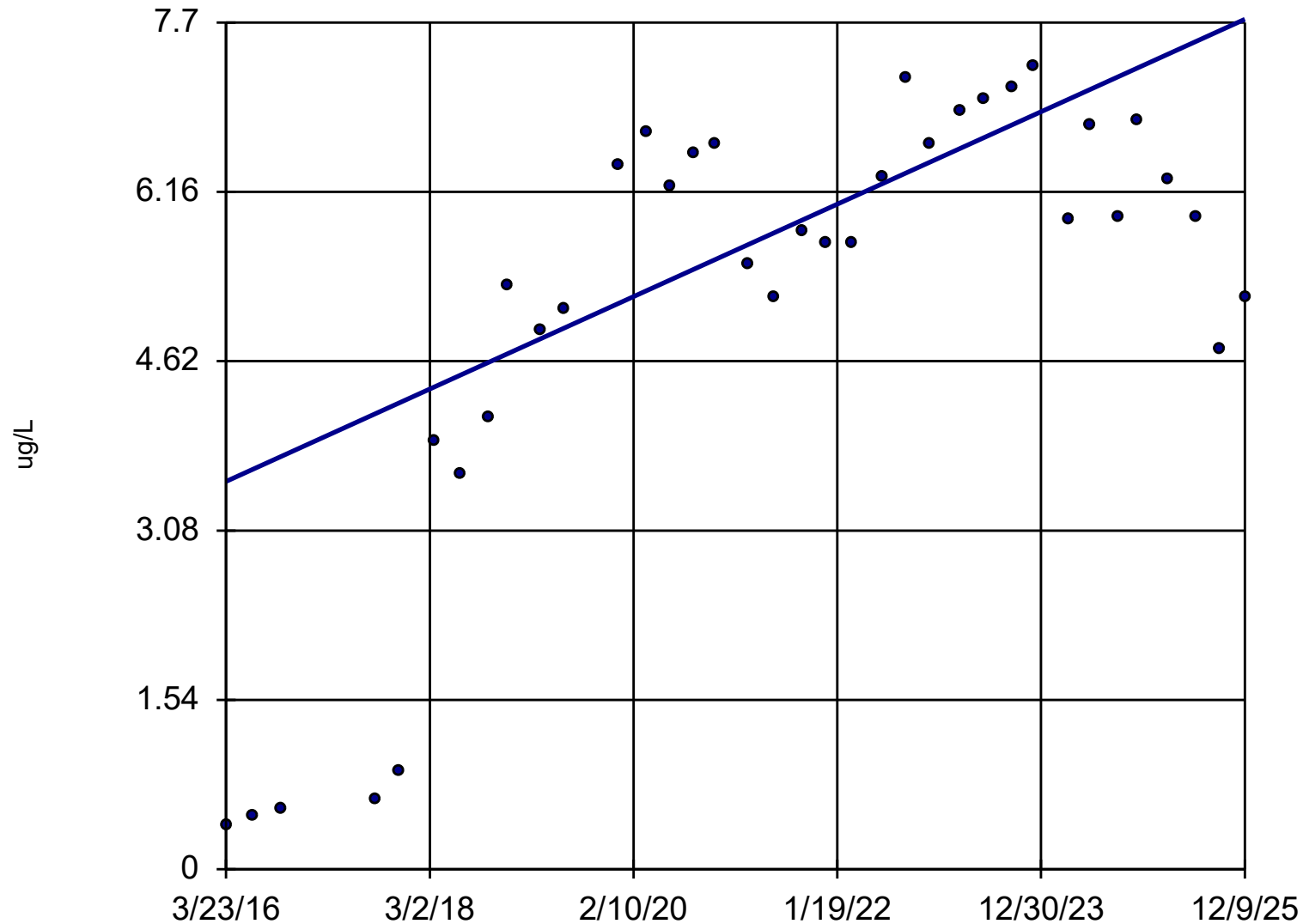
Decreasing trend significant at 98% confidence level ($\alpha = 0.01$ per tail).

Constituent: Benzene Analysis Run 2/13/2026 4:22 PM View: 10 yr trend_part 2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWell#3



n = 36

Slope = 0.4326
units per year.

Mann-Kendall
statistic = 312
critical = 171

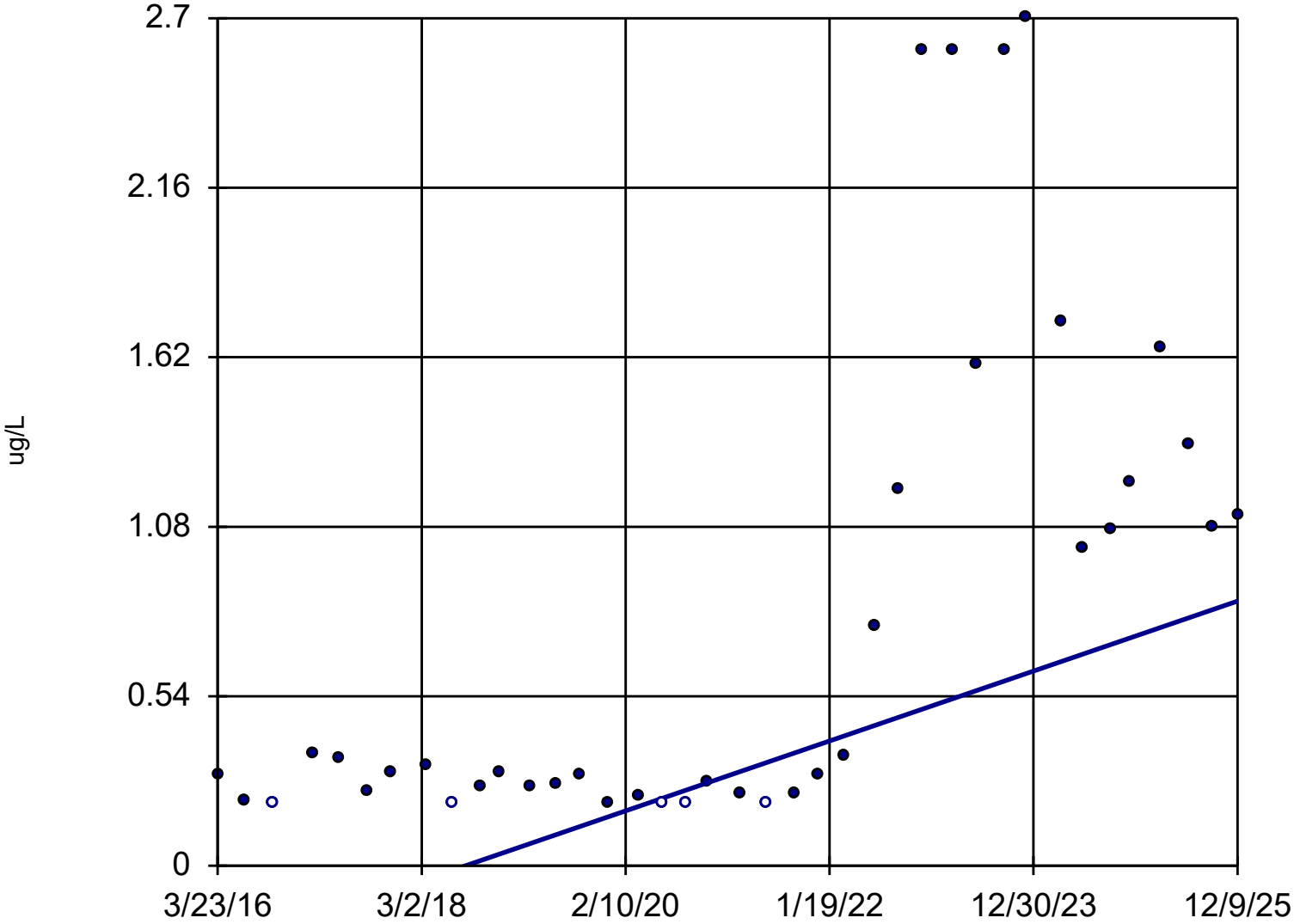
Increasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Chloroform Analysis Run 2/13/2026 4:22 PM View: 10 yr trend_part 2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

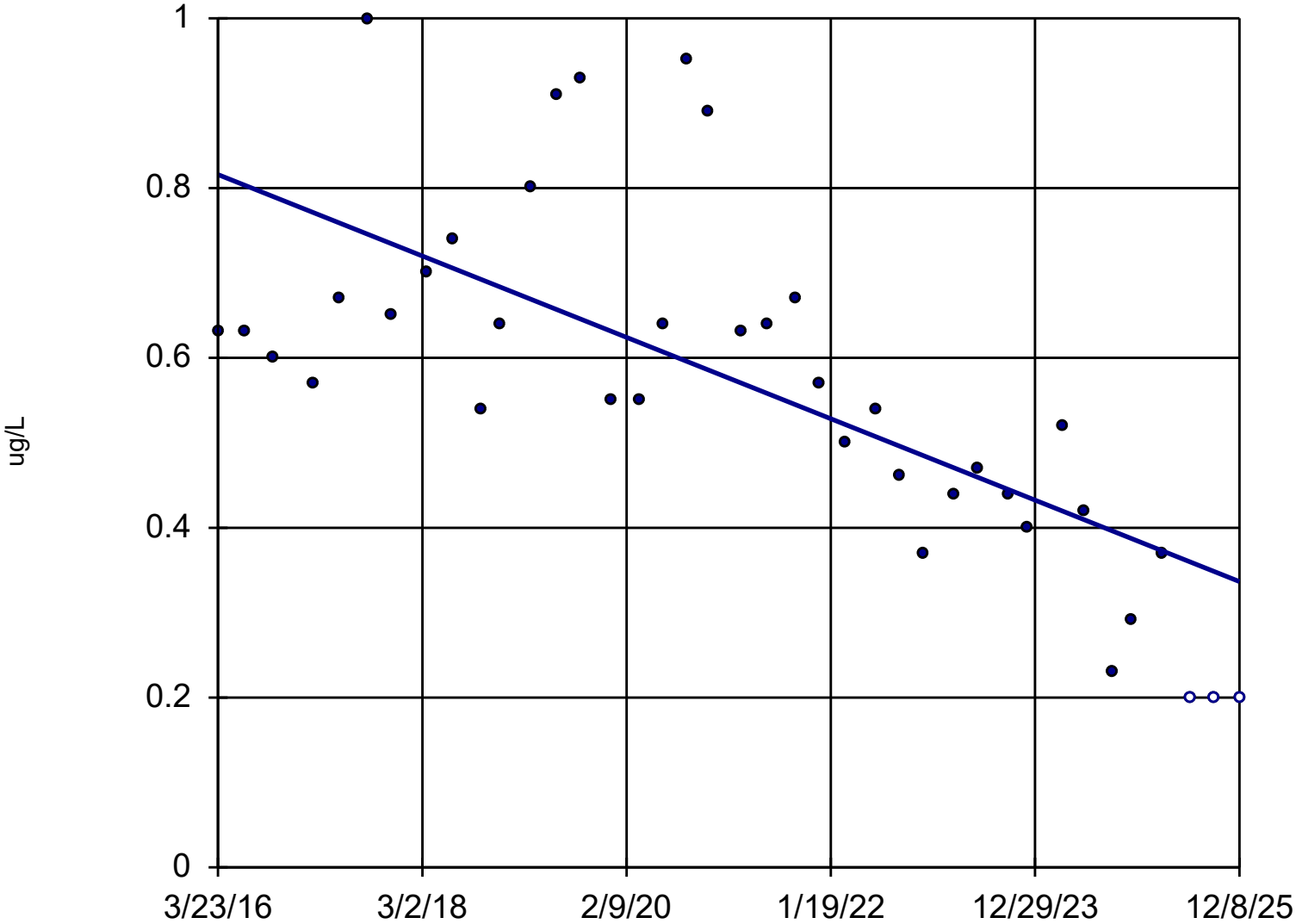
Sen's Slope Estimator

MWell#9



Sen's Slope Estimator

MWell#10



n = 39

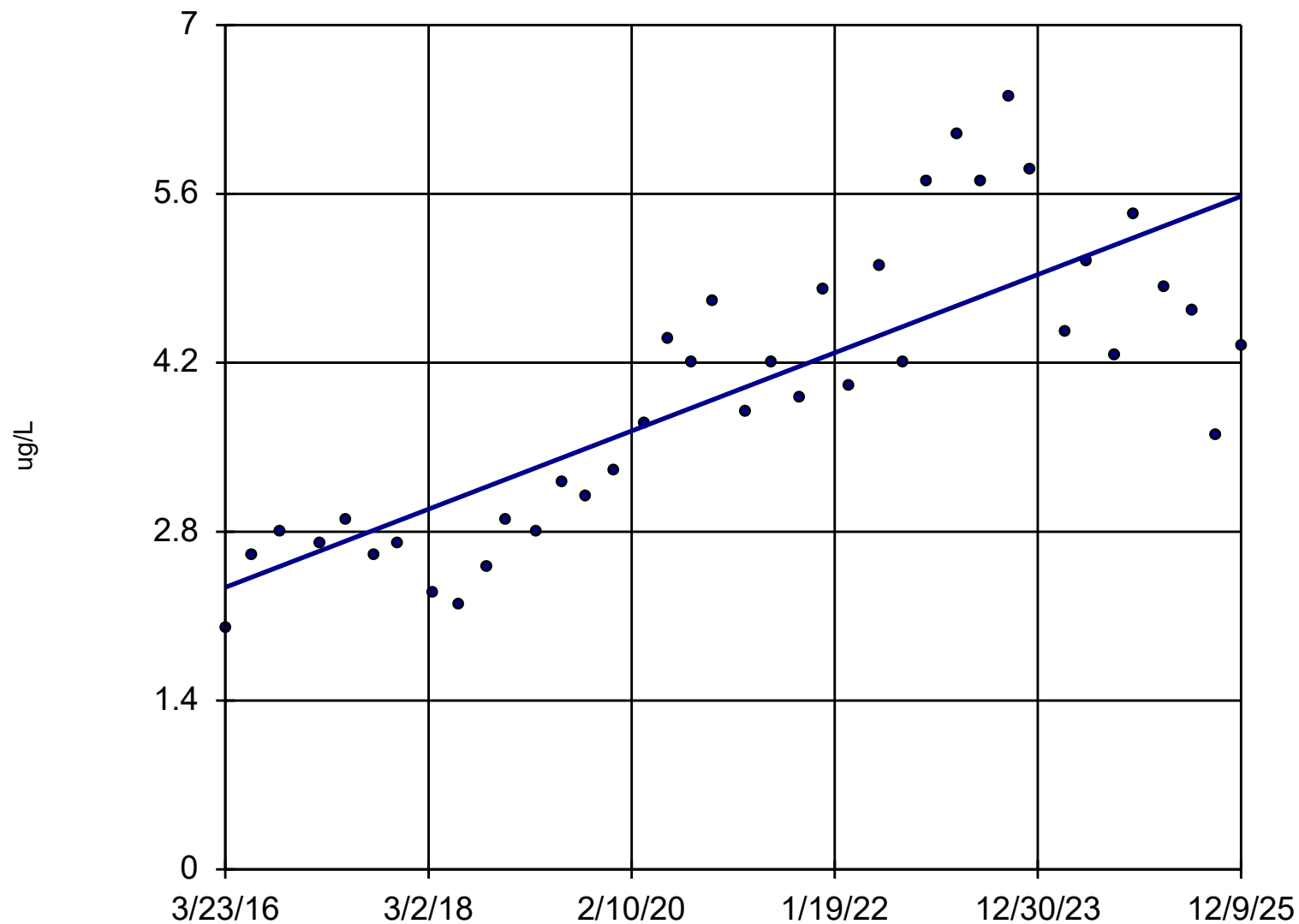
Slope = -0.04932
units per year.

Mann-Kendall
statistic = -426
critical = -194

Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Sen's Slope Estimator

MWell#4



n = 39

Slope = 0.3337
units per year.

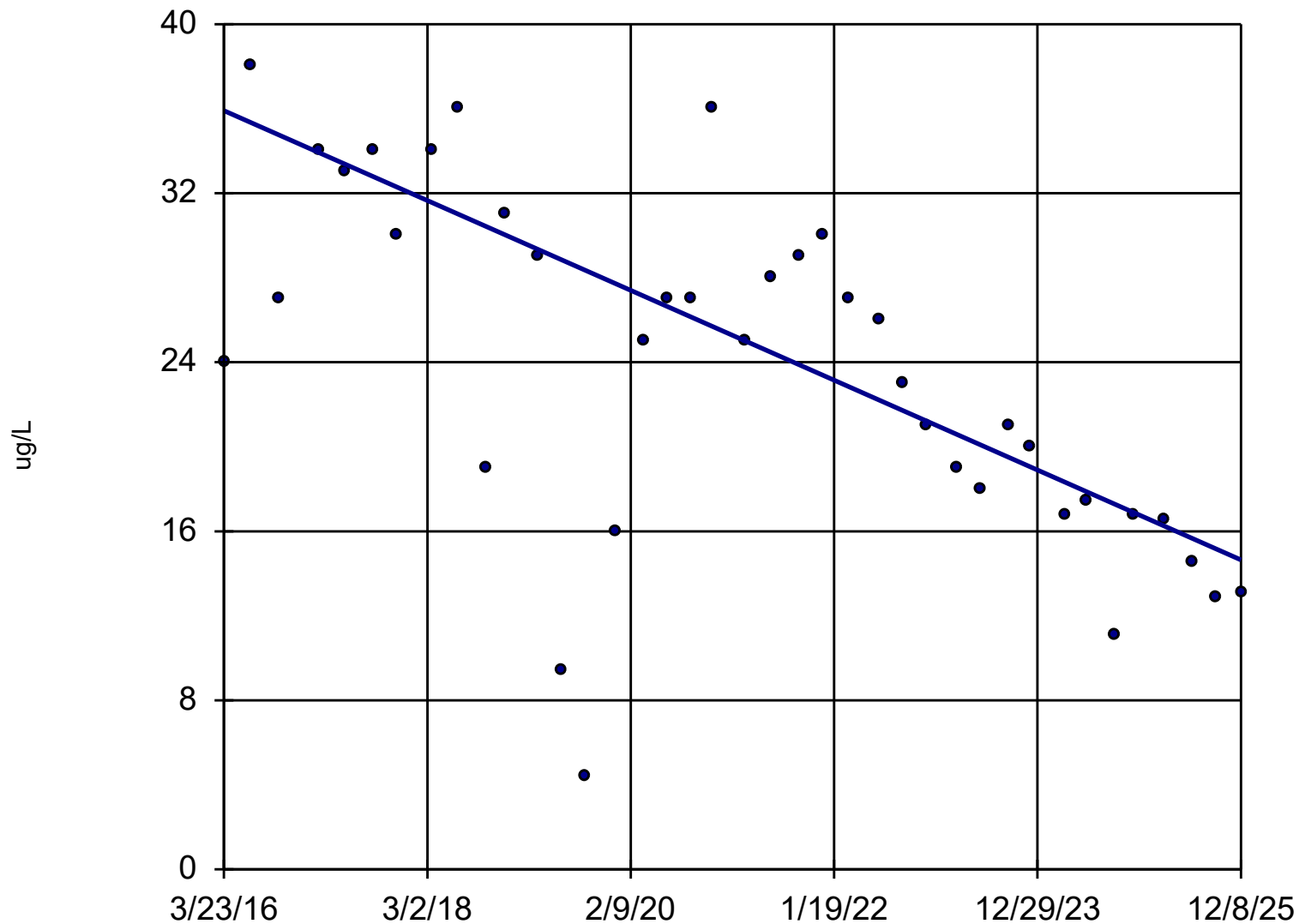
Mann-Kendall
statistic = 465
critical = 194

Increasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: cis-1,2-Dichloroethene Analysis Run 2/13/2026 4:23 PM View: 10 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

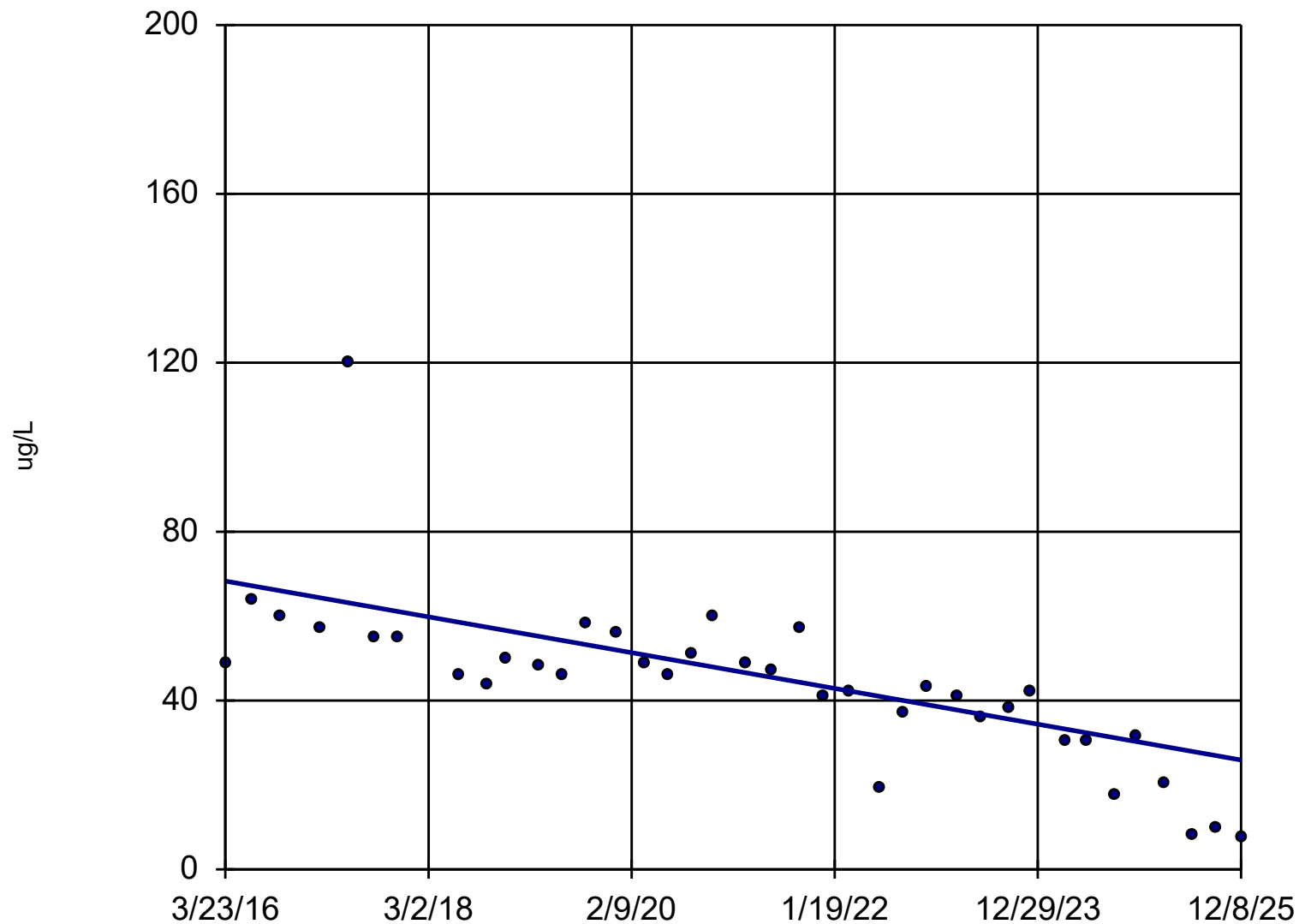
MWell#5



Constituent: cis-1,2-Dichloroethene Analysis Run 2/13/2026 4:23 PM View: 10 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

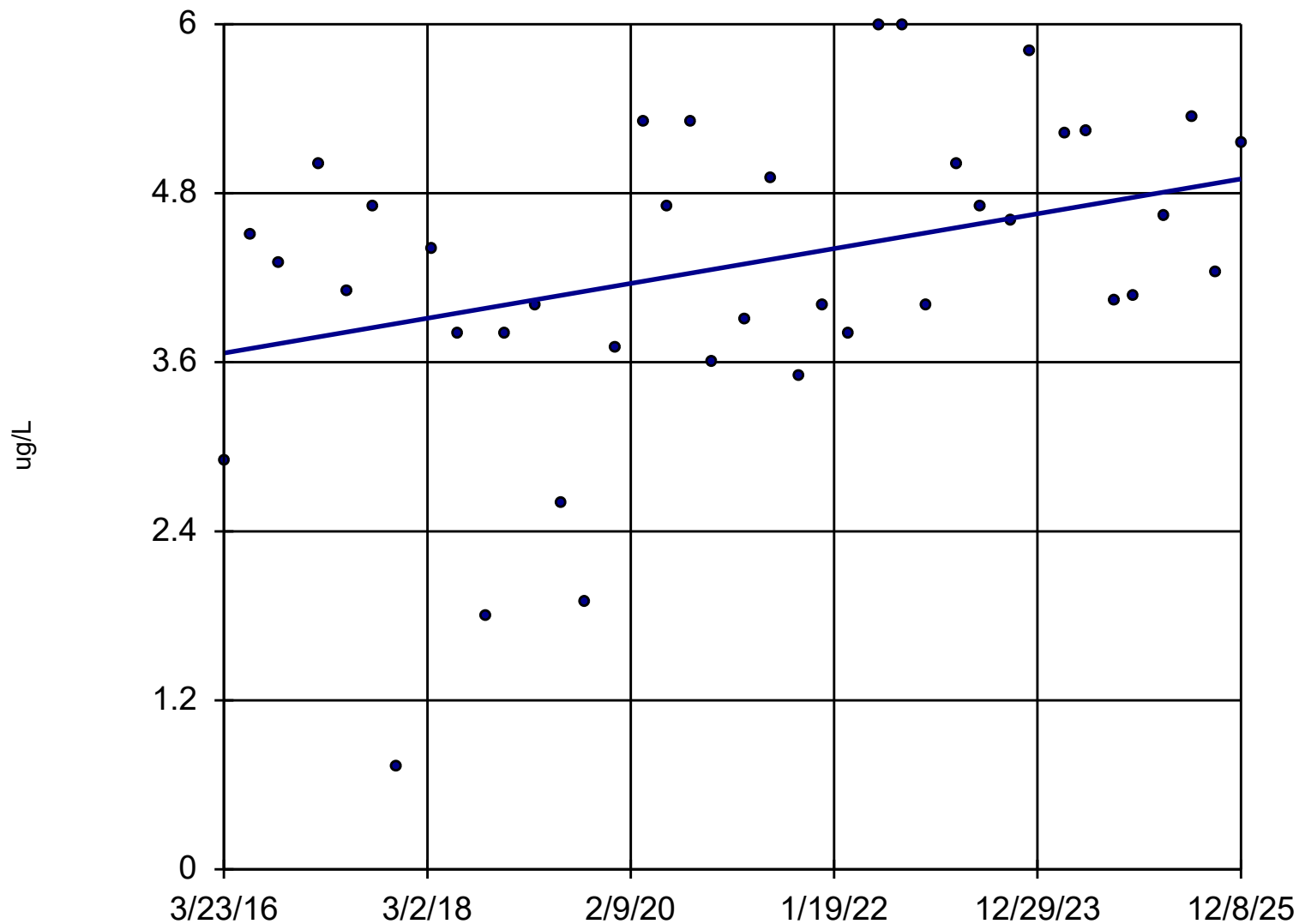
MWell#6



Constituent: cis-1,2-Dichloroethene Analysis Run 2/13/2026 4:23 PM View: 10 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWell#1



n = 39

Slope = 0.1274
units per year.

Mann-Kendall
statistic = 207
critical = 194

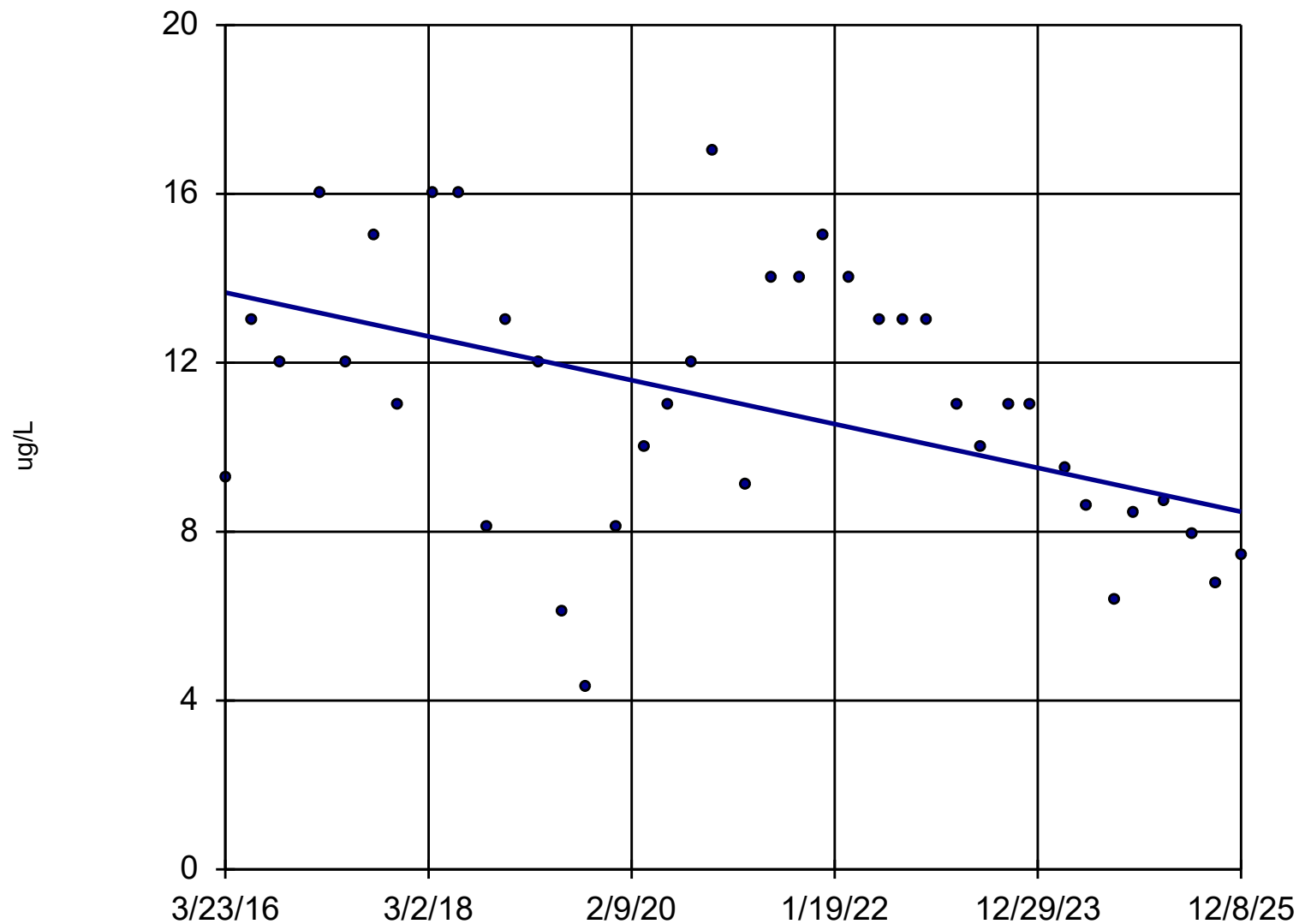
Increasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Tetrachloroethene Analysis Run 2/13/2026 4:23 PM View: 10 yr trend_part 2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

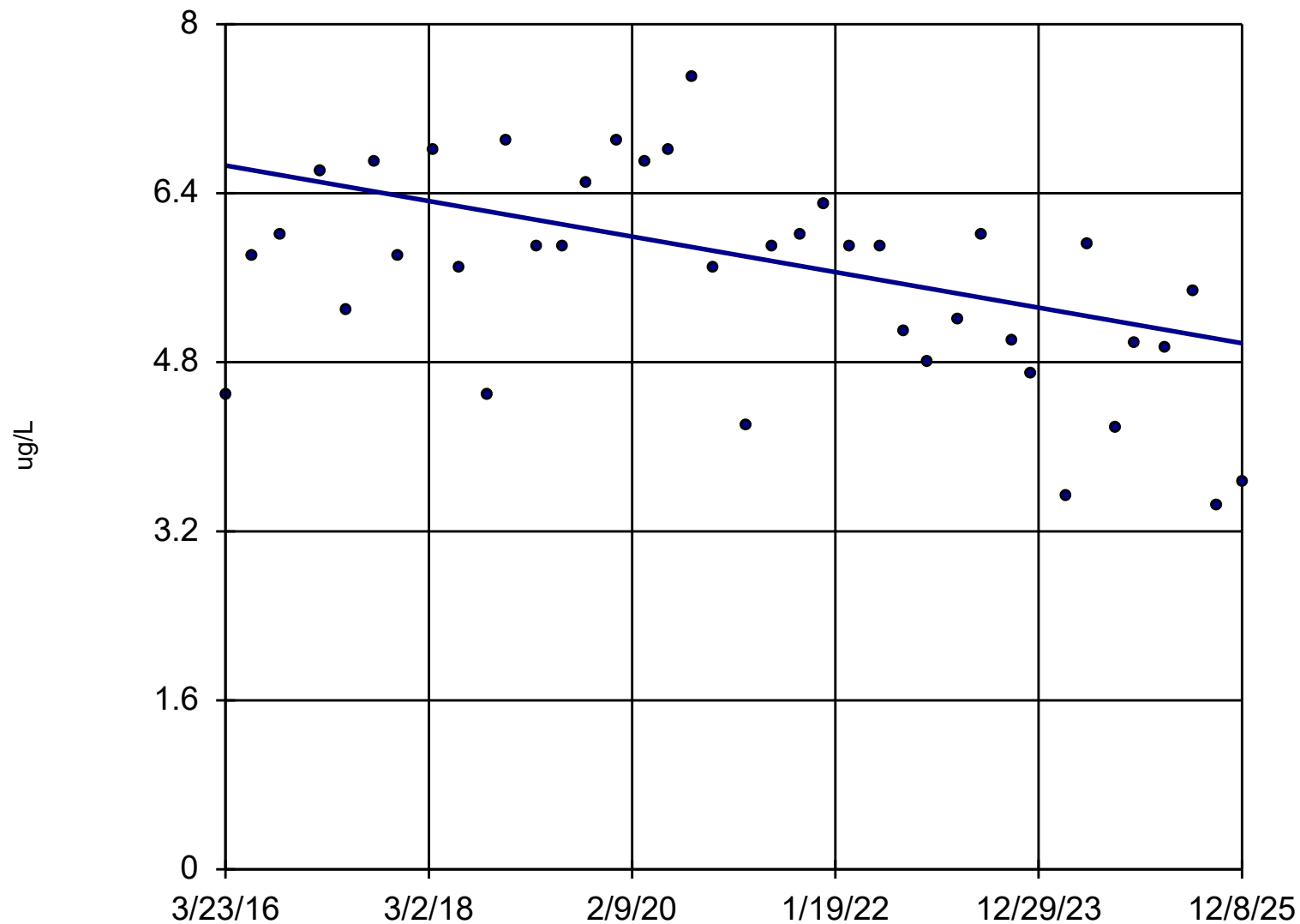
MWell#5



Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWell#10

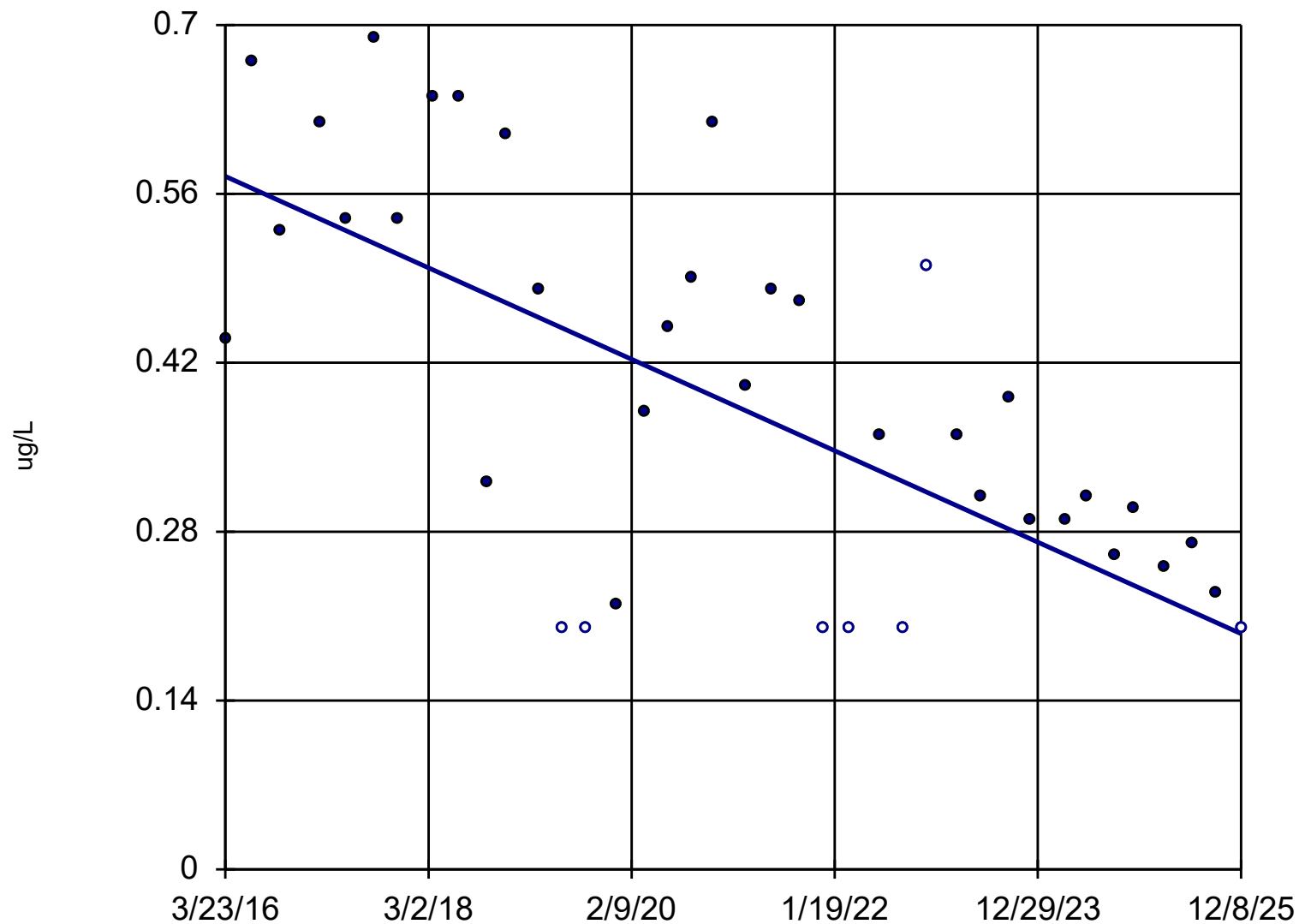


Constituent: Tetrachloroethene Analysis Run 2/13/2026 4:23 PM View: 10 yr trend_part 2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWWell#5



n = 39

Slope = -0.03905
units per year.

Mann-Kendall
statistic = -349
critical = -194

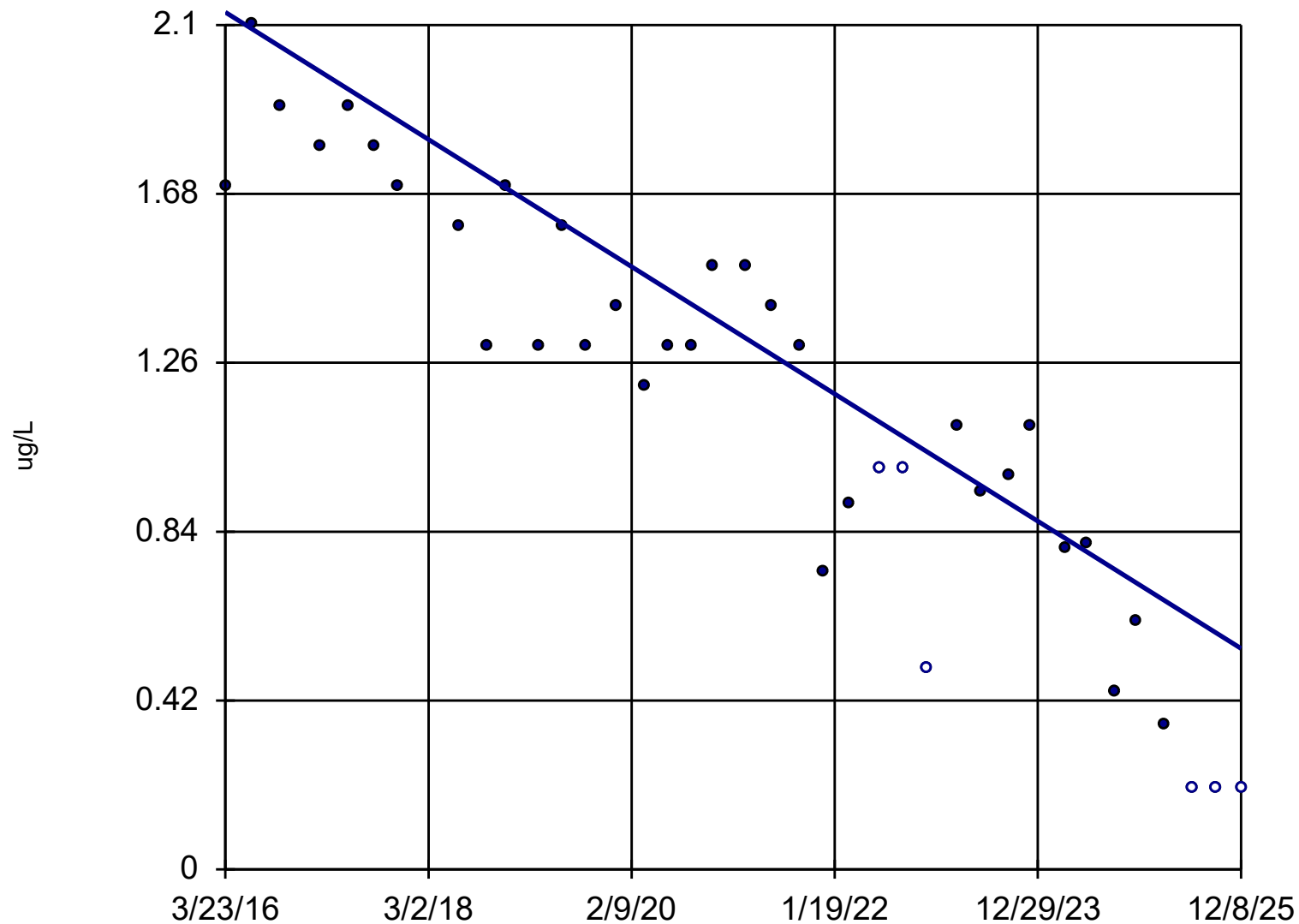
Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: trans-1,2-Dichloroethene Analysis Run 2/13/2026 4:23 PM View: 10 yr trend_part 2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWWell#6



n = 38

Slope = -0.1629
units per year.

Mann-Kendall
statistic = -541
critical = -186

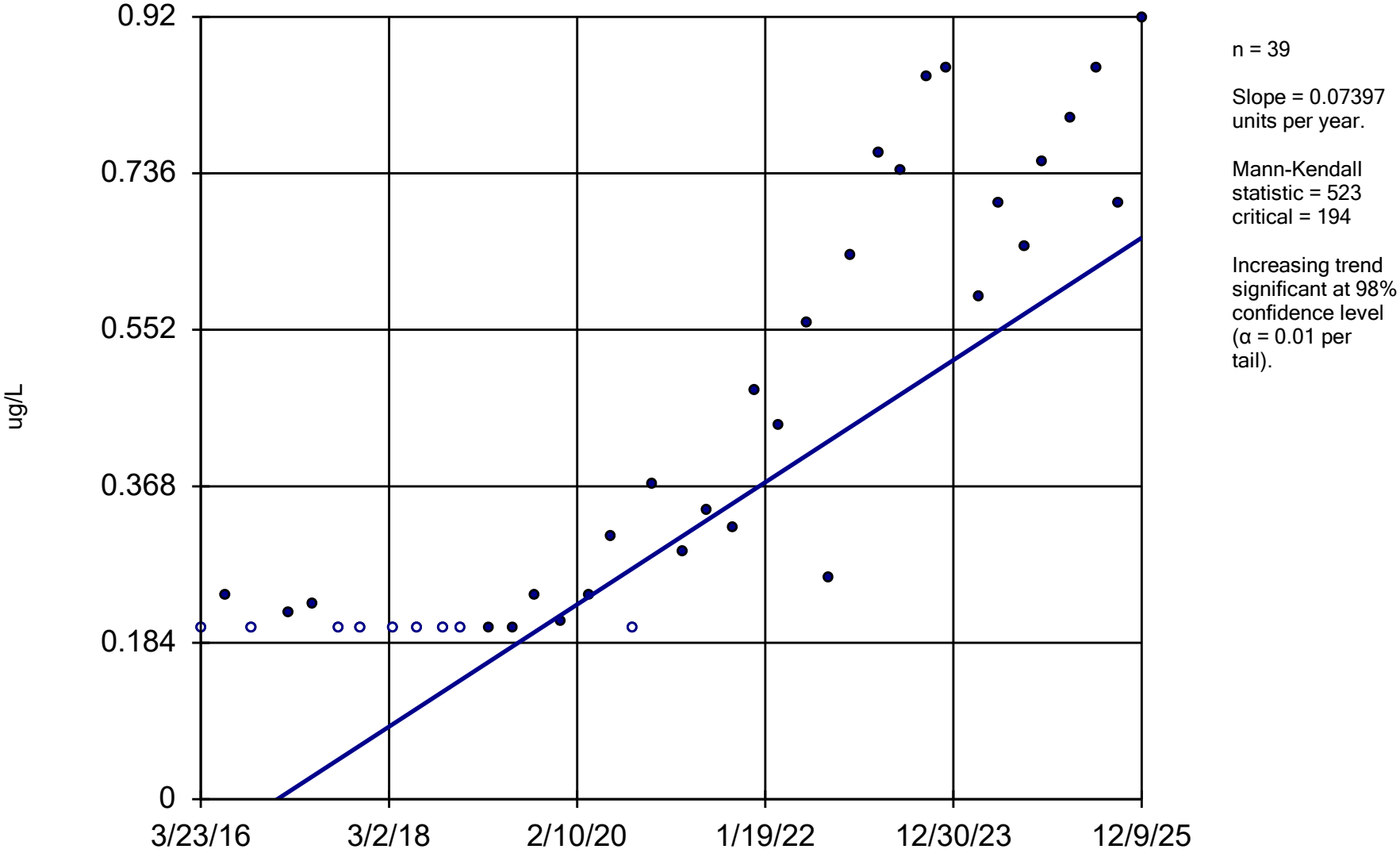
Decreasing trend significant at 98% confidence level ($\alpha = 0.01$ per tail).

Constituent: trans-1,2-Dichloroethene Analysis Run 2/13/2026 4:23 PM View: 10 yr trend_part 2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

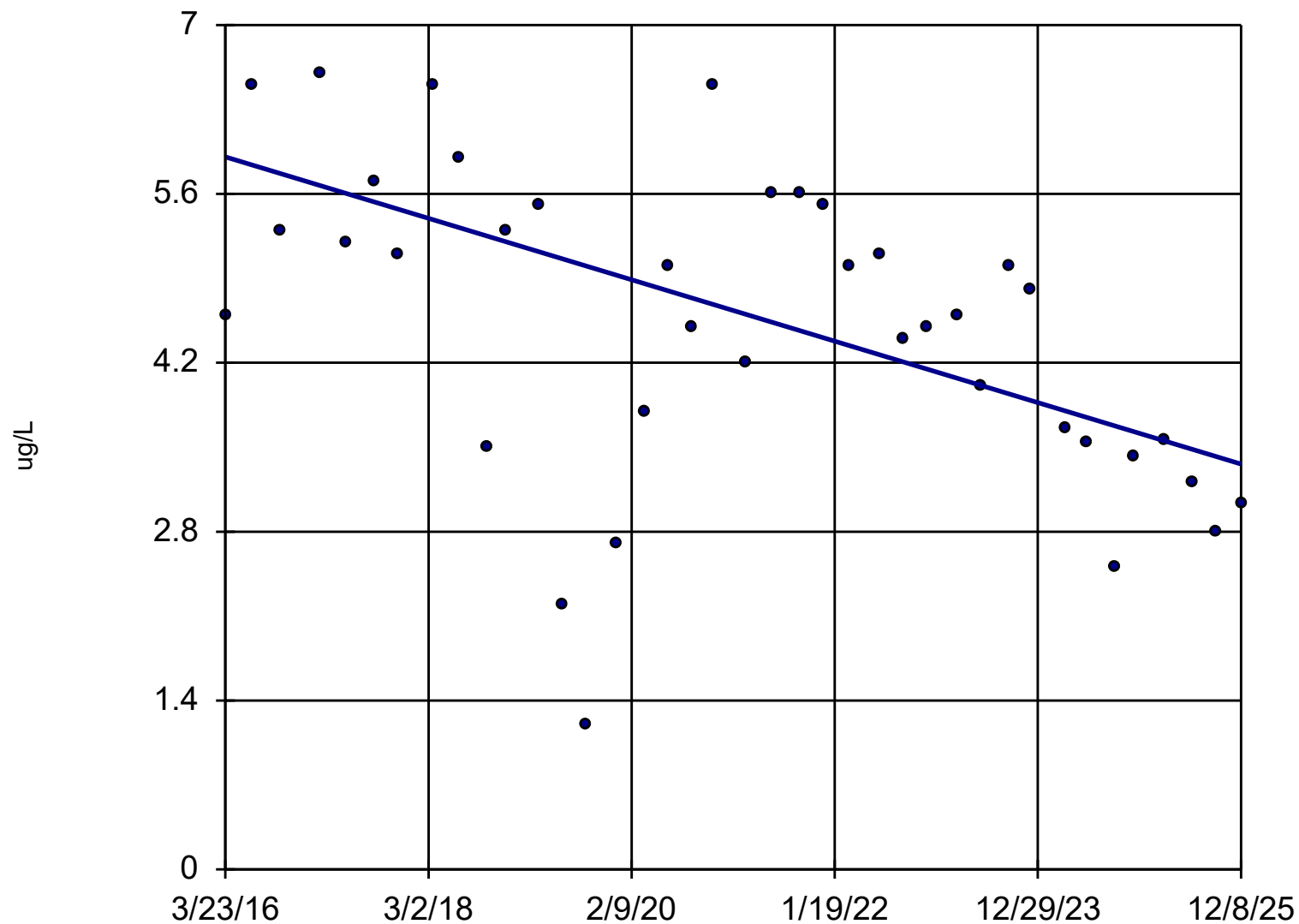
Sen's Slope Estimator

MWell#4



Sen's Slope Estimator

MWell#5

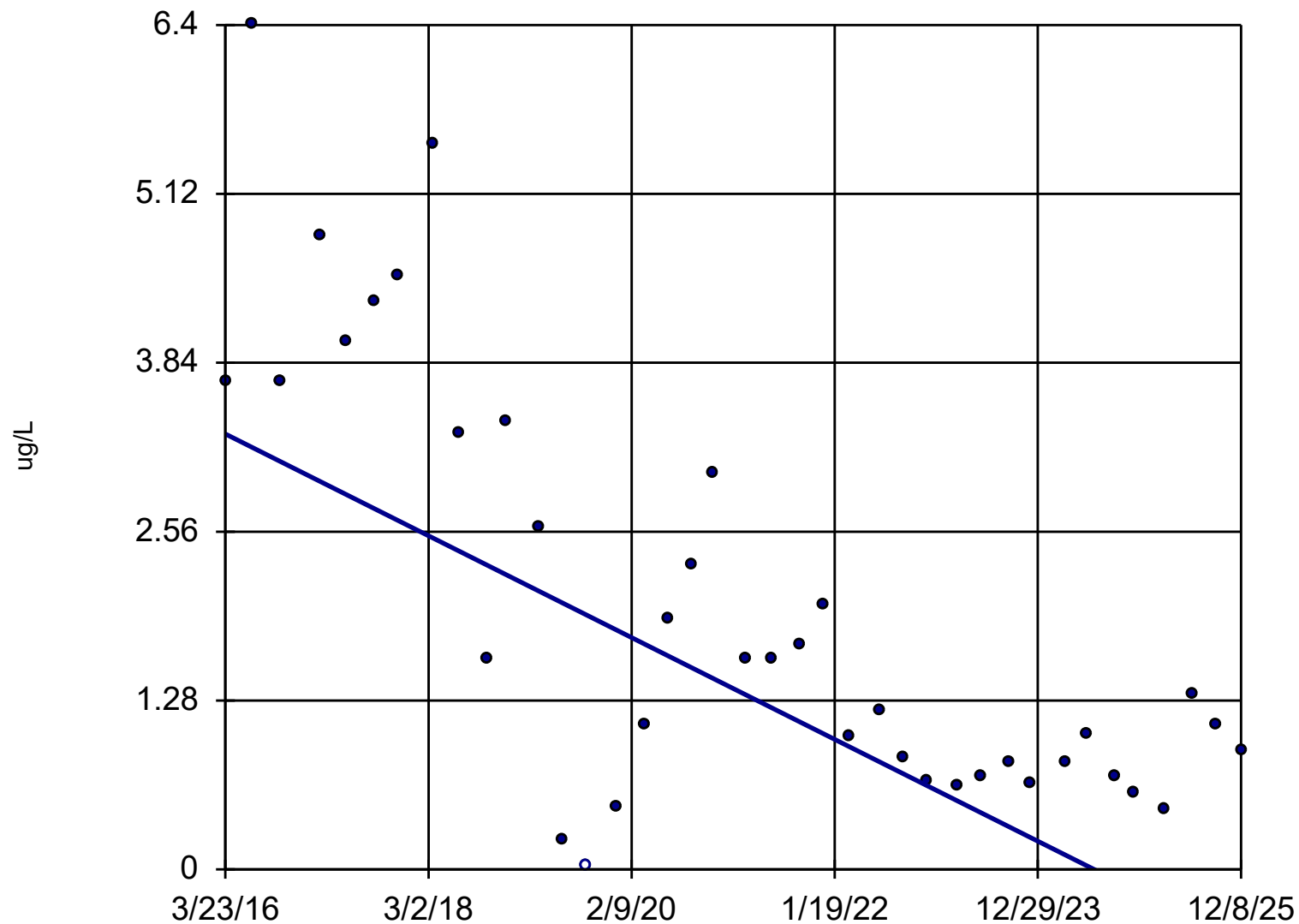


Constituent: Trichloroethene Analysis Run 2/13/2026 4:23 PM View: 10 yr trend_part 2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWWell#5



n = 39

Slope = -0.3971
units per year.

Mann-Kendall
statistic = -383
critical = -194

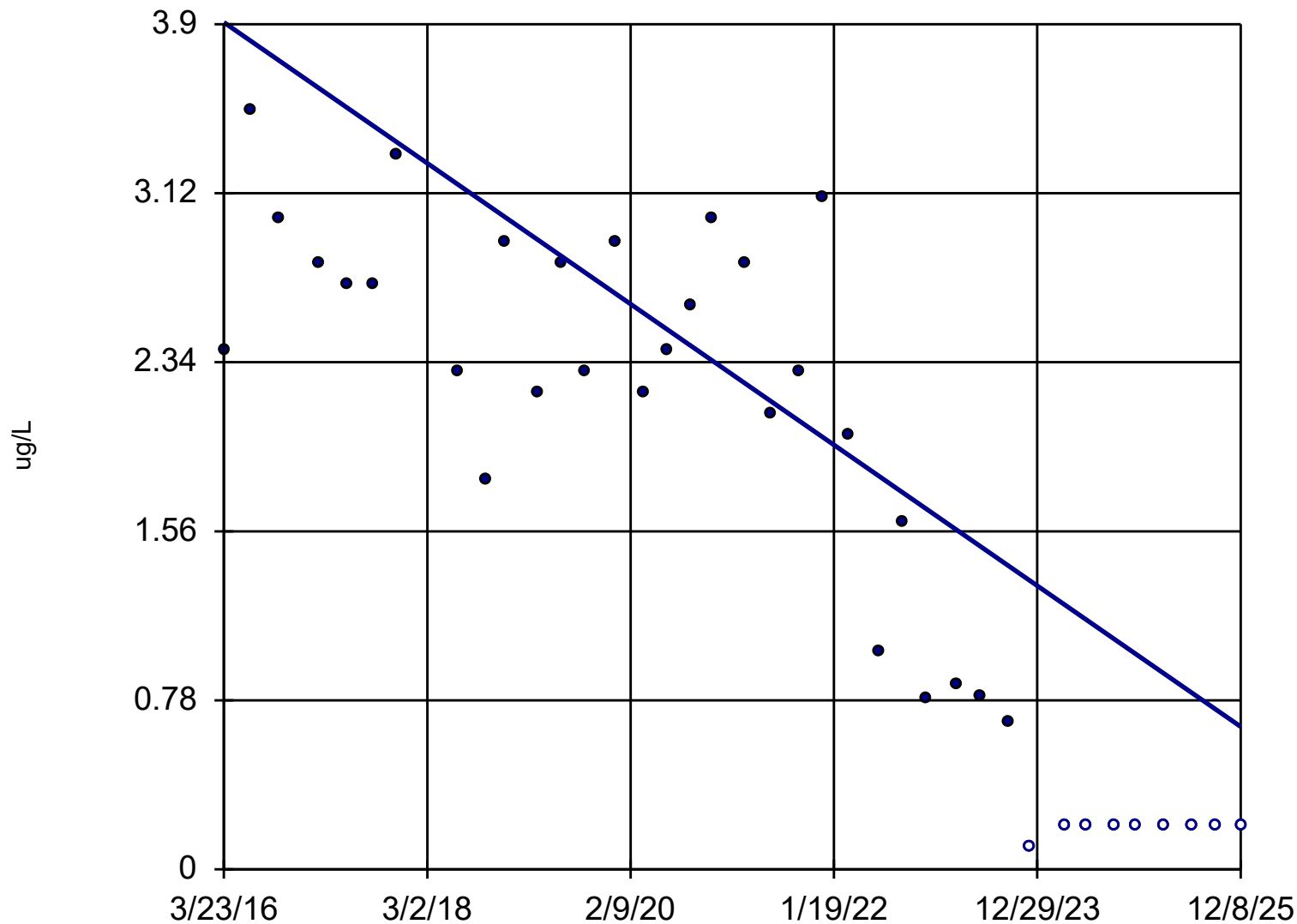
Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Vinyl Chloride Analysis Run 2/13/2026 4:23 PM View: 10 yr trend_part 2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWWell#6



n = 38

Slope = -0.3346
units per year.

Mann-Kendall
statistic = -450
critical = -186

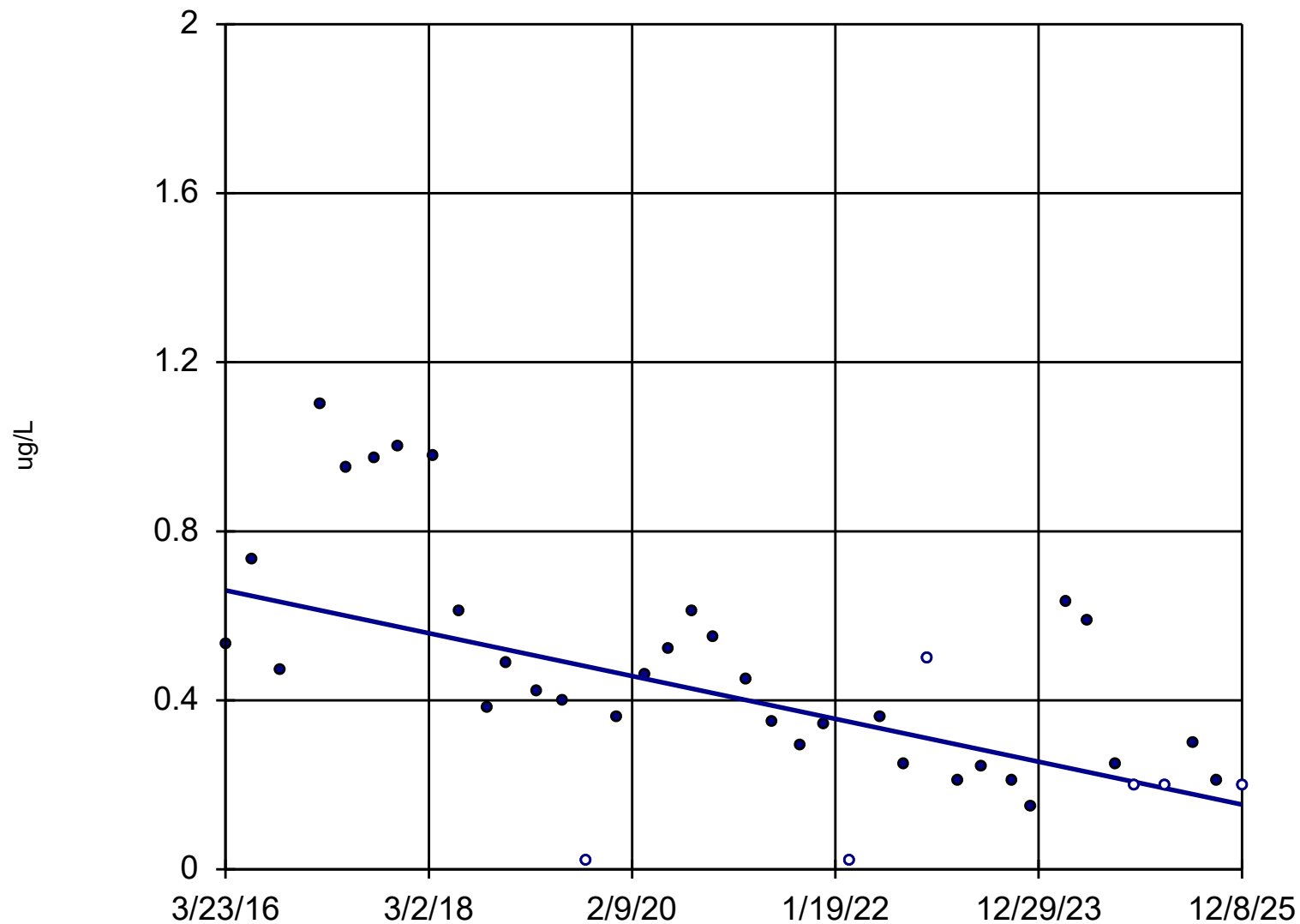
Decreasing trend significant at 98% confidence level ($\alpha = 0.01$ per tail).

Constituent: Vinyl Chloride Analysis Run 2/13/2026 4:23 PM View: 10 yr trend_part 2

Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWell#10



n = 39

Slope = -0.05214
units per year.

Mann-Kendall
statistic = -371
critical = -194

Decreasing trend significant at 98% confidence level ($\alpha = 0.01$ per tail).

Constituent: Vinyl Chloride Analysis Run 2/13/2026 4:23 PM View: 10 yr trend_part 2

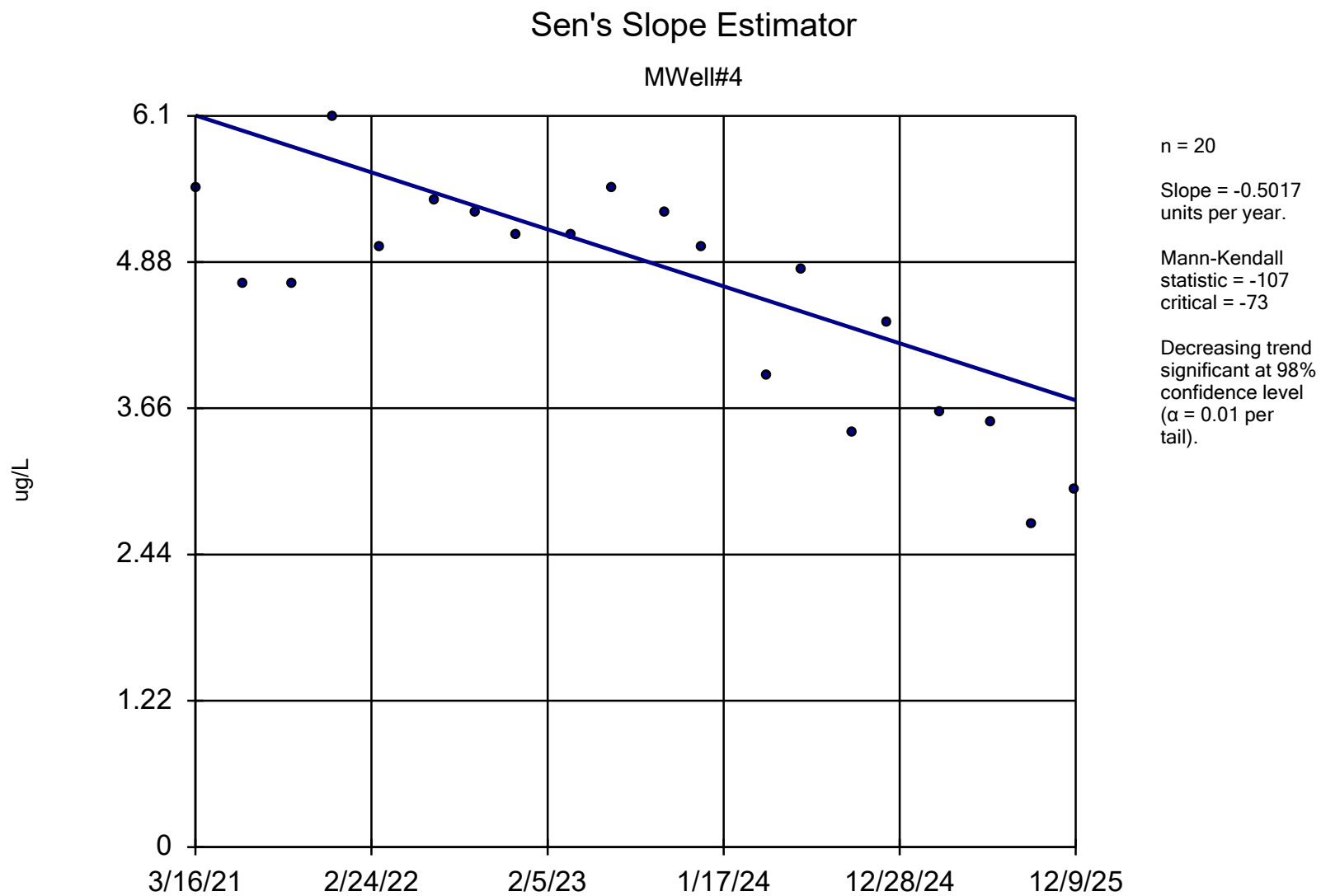
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

D-2

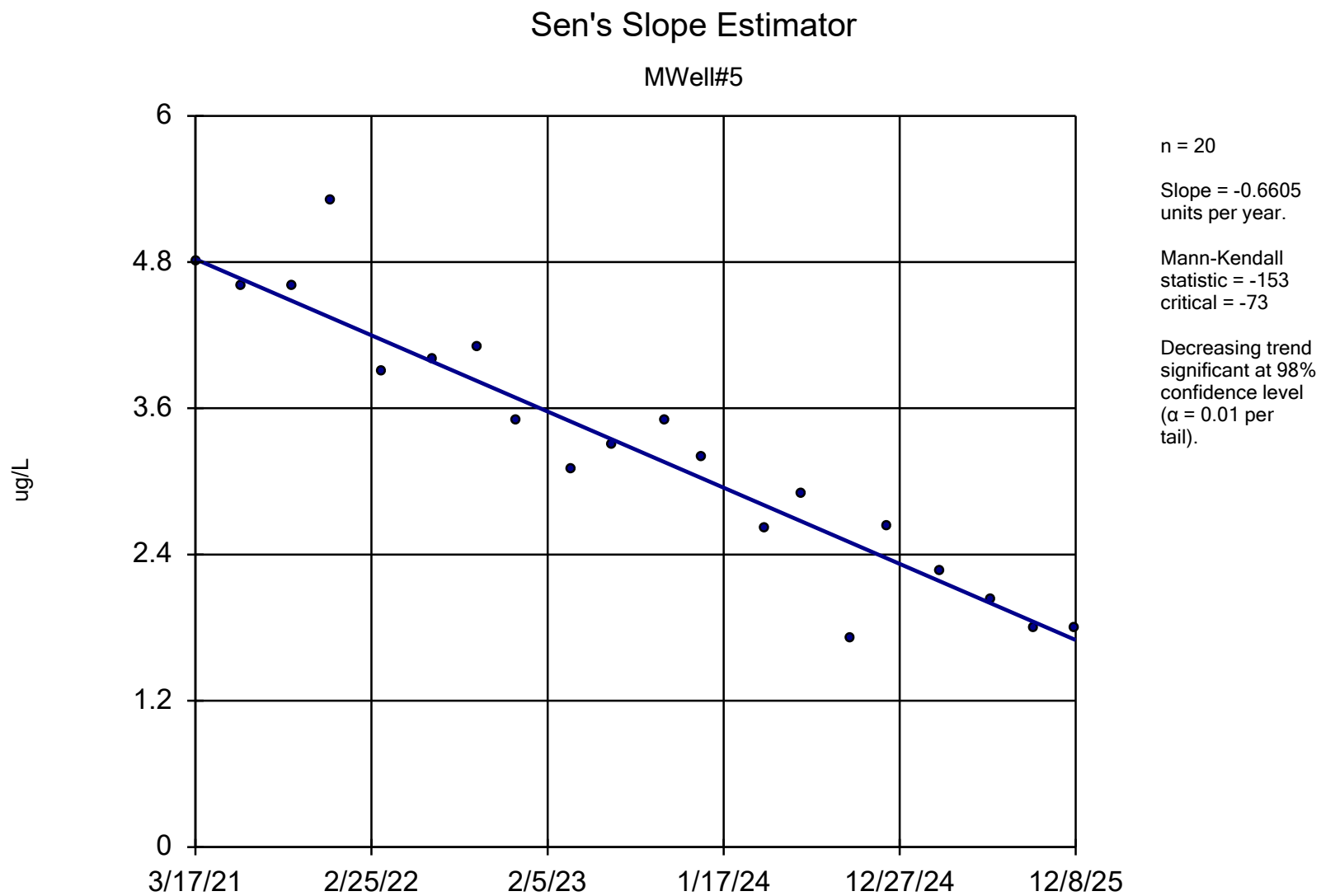
5-Year Trends

Horn Rapids Landfill Trends for Volatile Organic Compounds, First Quarter 2021 through Fourth Quarter 2025

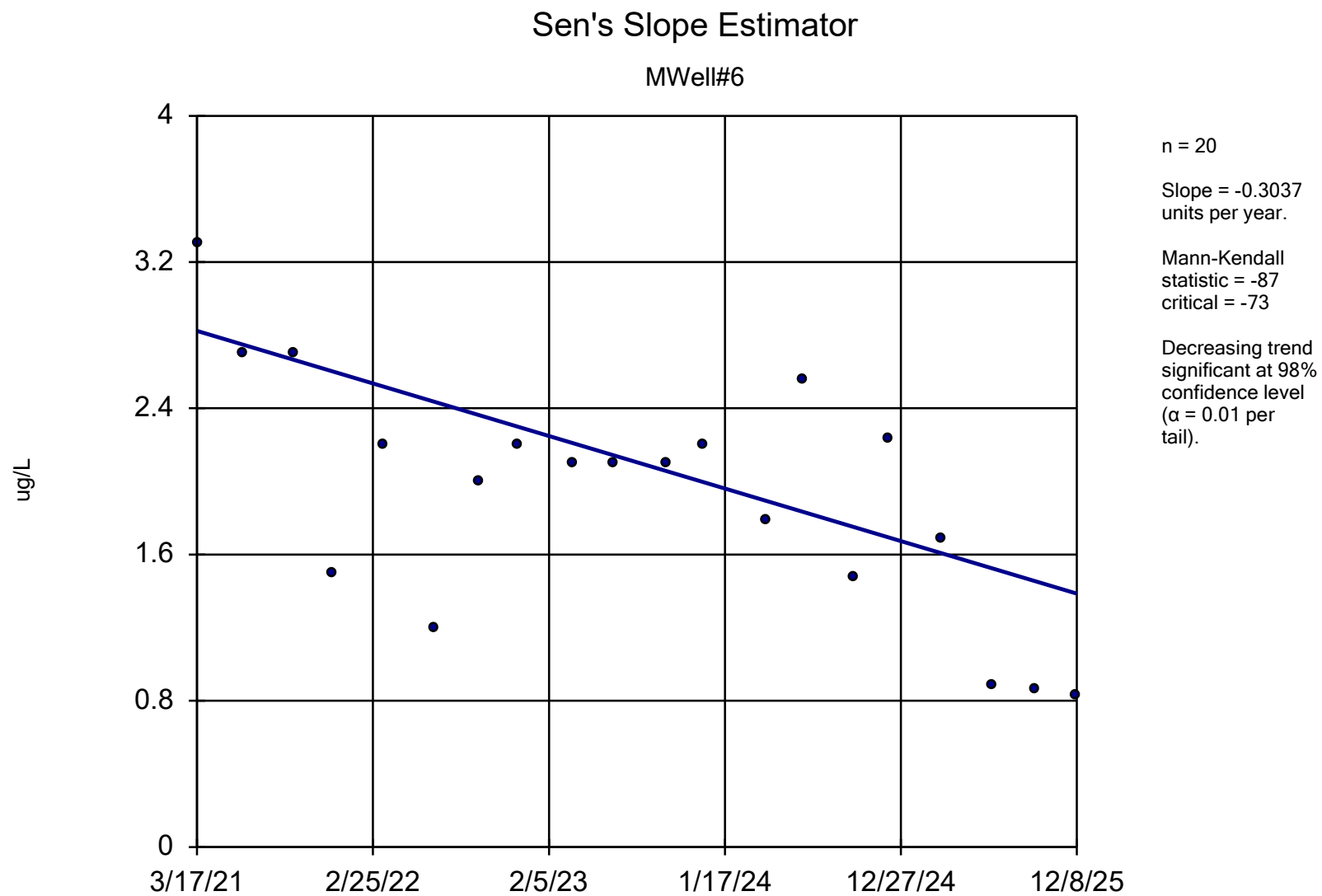
Constituent Name	Well	Slope	Calculated Statistic	Critical Value	Trend	N	% Non-detects	Normality	Transformation	Alpha	Method
1,1-Dichloroethane (ug/L)	MWell#4	-0.5017	-107	-73	Yes	20	0	n/a	n/a	0.02	NP
1,1-Dichloroethane (ug/L)	MWell#5	-0.6605	-153	-73	Yes	20	0	n/a	n/a	0.02	NP
1,1-Dichloroethane (ug/L)	MWell#6	-0.3037	-87	-73	Yes	20	0	n/a	n/a	0.02	NP
1,1-Dichloroethane (ug/L)	MWell#9	-0.2375	-115	-73	Yes	20	0	n/a	n/a	0.02	NP
1,1-Dichloroethane (ug/L)	MWell#10	-0.8426	-159	-73	Yes	20	0	n/a	n/a	0.02	NP
1,2-Dichloroethane (ug/L)	MWell#5	-0.0622	-117	-73	Yes	20	5	n/a	n/a	0.02	NP
1,2-Dichloroethane (ug/L)	MWell#6	-0.0384	-117	-73	Yes	20	40	n/a	n/a	0.02	NP
1,2-Dichloropropane (ug/L)	MWell#5	-0.0284	-122	-73	Yes	20	35	n/a	n/a	0.02	NP
Benzene (ug/L)	MWell#6	-0.03	-120	-73	Yes	20	35	n/a	n/a	0.02	NP
Chloroform (ug/L)	MWell#10	-0.0914	-141	-73	Yes	20	15	n/a	n/a	0.02	NP
cis-1,2-Dichloroethene (ug/L)	MWell#5	-3.596	-150	-73	Yes	20	0	n/a	n/a	0.02	NP
cis-1,2-Dichloroethene (ug/L)	MWell#6	-8.276	-128	-73	Yes	20	0	n/a	n/a	0.02	NP
cis-1,2-Dichloroethene (ug/L)	MWell#9	-0.9888	-77	-73	Yes	20	0	n/a	n/a	0.02	NP
cis-1,2-Dichloroethene (ug/L)	MWell#10	-1.685	-101	-73	Yes	20	0	n/a	n/a	0.02	NP
Tetrachloroethene (ug/L)	MWell#4	0.05296	133	73	Yes	20	35	n/a	n/a	0.02	NP
Tetrachloroethene (ug/L)	MWell#5	-1.735	-133	-73	Yes	20	0	n/a	n/a	0.02	NP
Tetrachloroethene (ug/L)	MWell#6	-2.328	-97	-73	Yes	20	0	n/a	n/a	0.02	NP
Tetrachloroethene (ug/L)	MWell#9	-0.6243	-93	-73	Yes	20	0	n/a	n/a	0.02	NP
Tetrachloroethene (ug/L)	MWell#10	-0.3657	-74	-73	Yes	20	0	n/a	n/a	0.02	NP
trans-1,2-Dichloroethene (ug/L)	MWell#6	-0.236	-123	-73	Yes	20	30	n/a	n/a	0.02	NP
Trichloroethene (ug/L)	MWell#4	0.1265	118	73	Yes	20	0	n/a	n/a	0.02	NP
Trichloroethene (ug/L)	MWell#5	-0.5894	-128	-73	Yes	20	0	n/a	n/a	0.02	NP
Trichloroethene (ug/L)	MWell#6	-1.543	-109	-73	Yes	20	0	n/a	n/a	0.02	NP
Trichloroethene (ug/L)	MWell#10	-0.2539	-91	-73	Yes	20	0	n/a	n/a	0.02	NP
Trichlorofluoromethane (ug/L)	MWell#4	-0.1464	-137	-73	Yes	20	0	n/a	n/a	0.02	NP
Vinyl Chloride (ug/L)	MWell#6	-0.506	-132	-73	Yes	20	45	n/a	n/a	0.02	NP



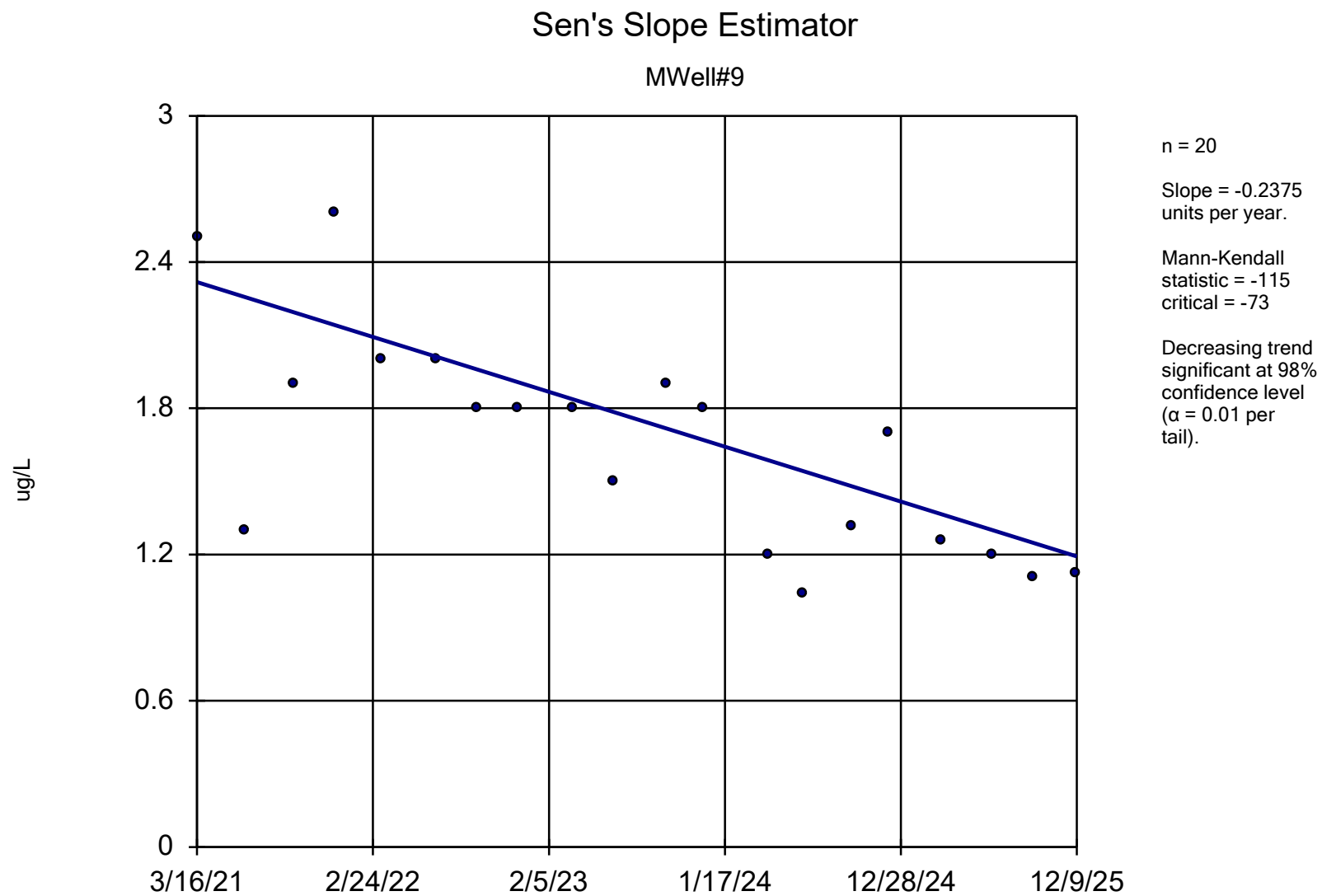
Constituent: 1,1-Dichloroethane Analysis Run 2/13/2026 3:28 PM View: 5 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata



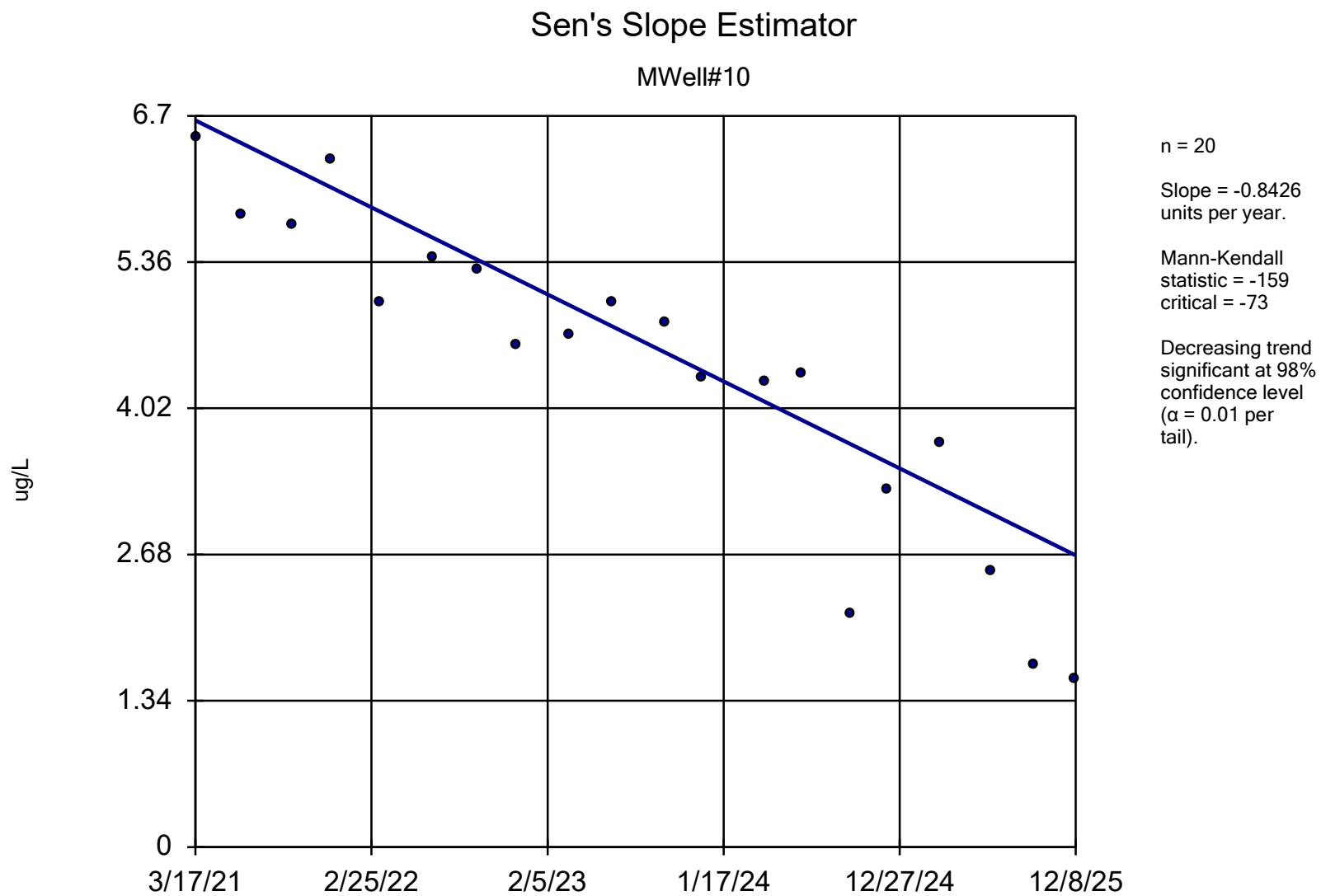
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Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata



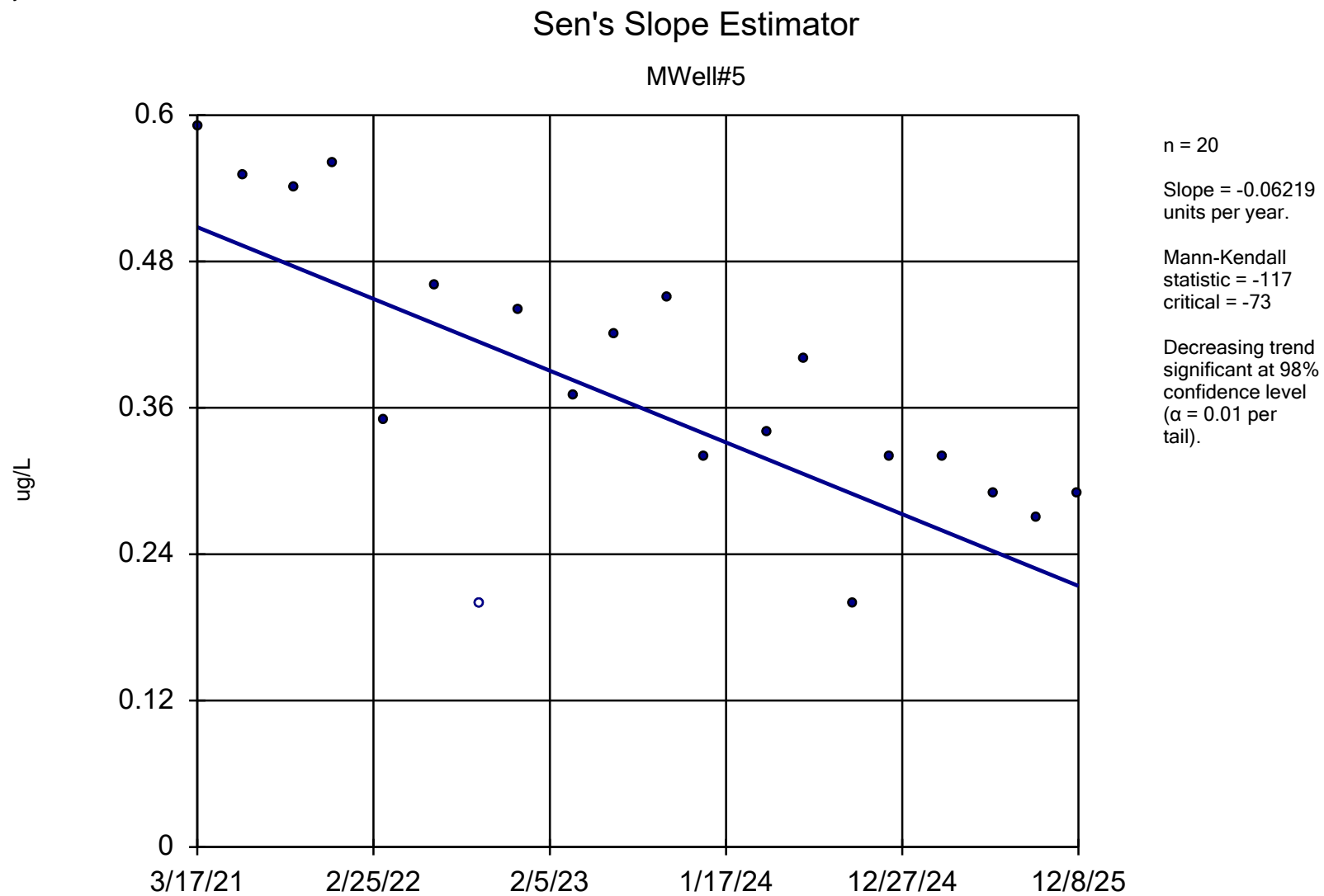
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Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata



Constituent: 1,1-Dichloroethane Analysis Run 2/13/2026 3:28 PM View: 5 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata



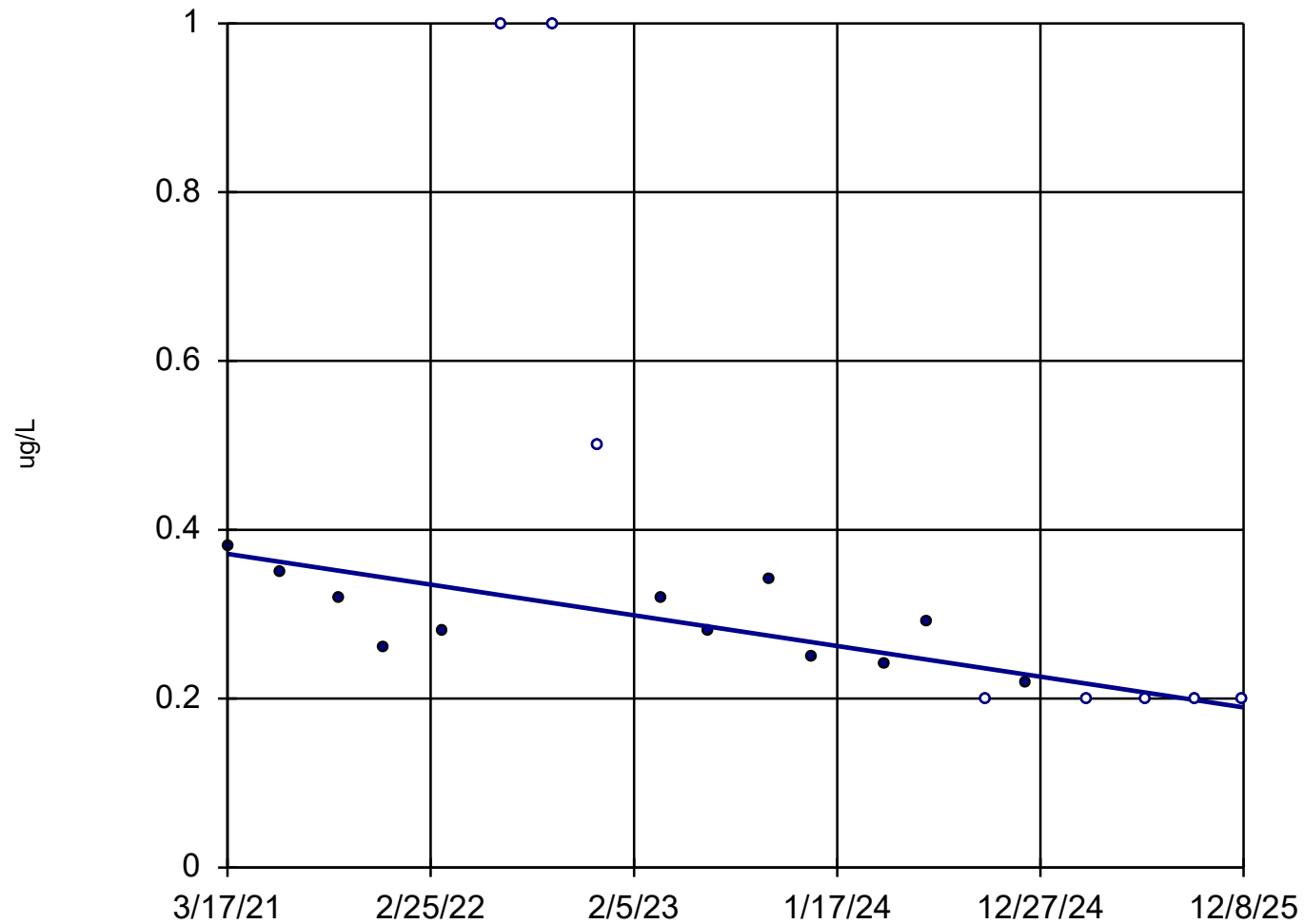
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Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata



Constituent: 1,2-Dichloroethane Analysis Run 2/13/2026 3:28 PM View: 5 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWWell#6



$n = 20$

Slope = -0.03844
units per year.

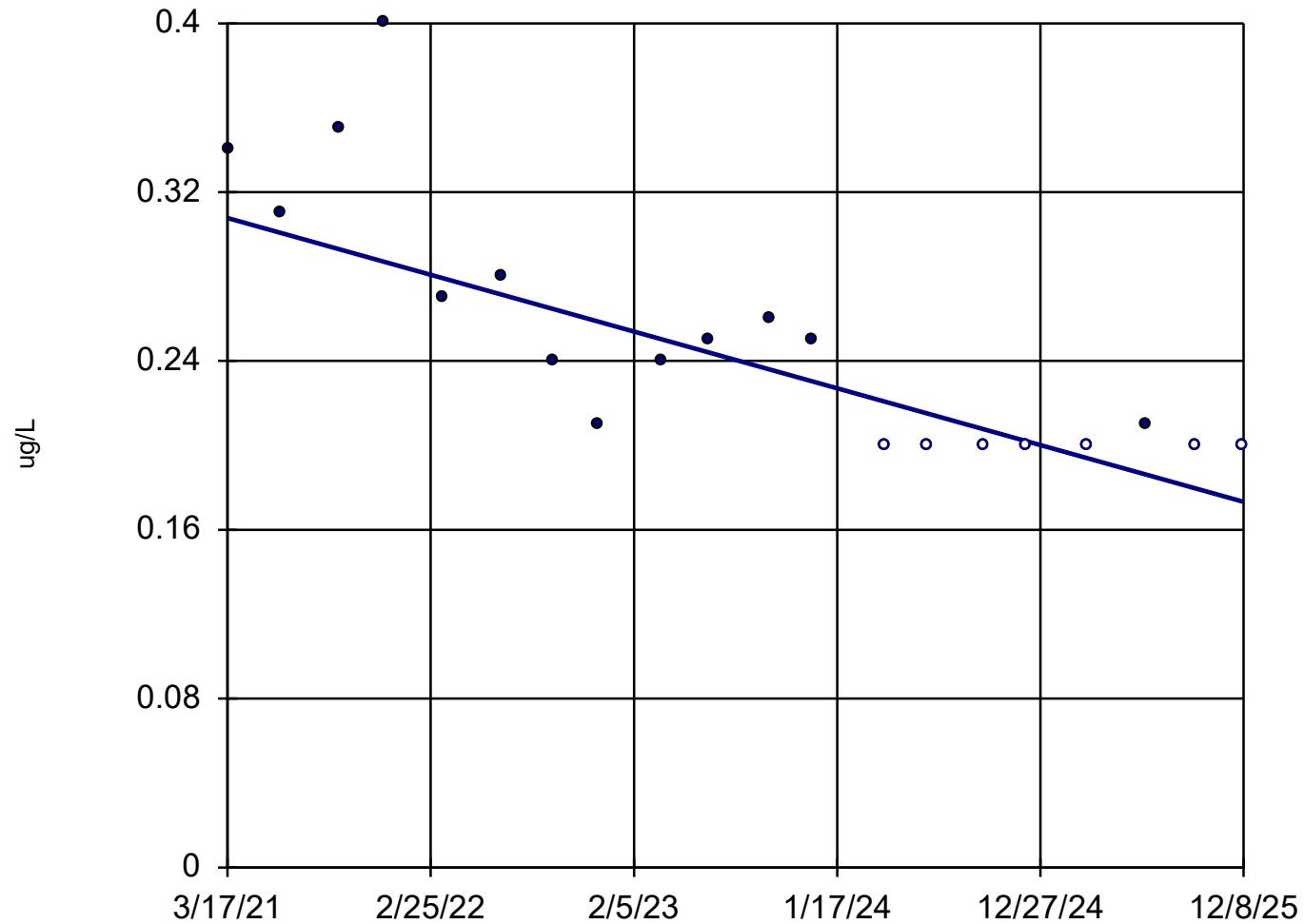
Mann-Kendall
statistic = -117
critical = -73

Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: 1,2-Dichloroethane Analysis Run 2/13/2026 3:28 PM View: 5 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWell#5



$n = 20$

Slope = -0.02843
units per year.

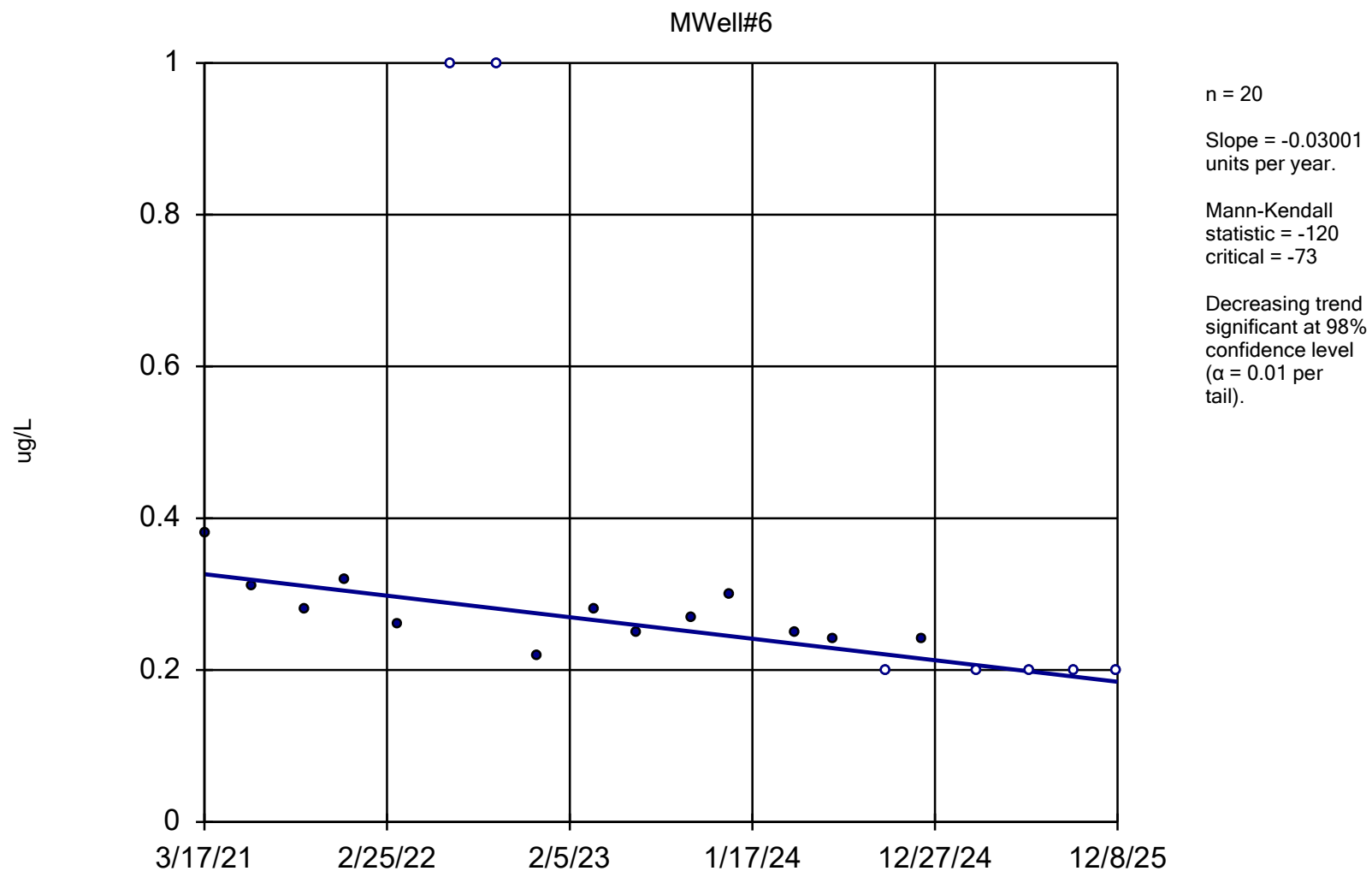
Mann-Kendall
statistic = -122
critical = -73

Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

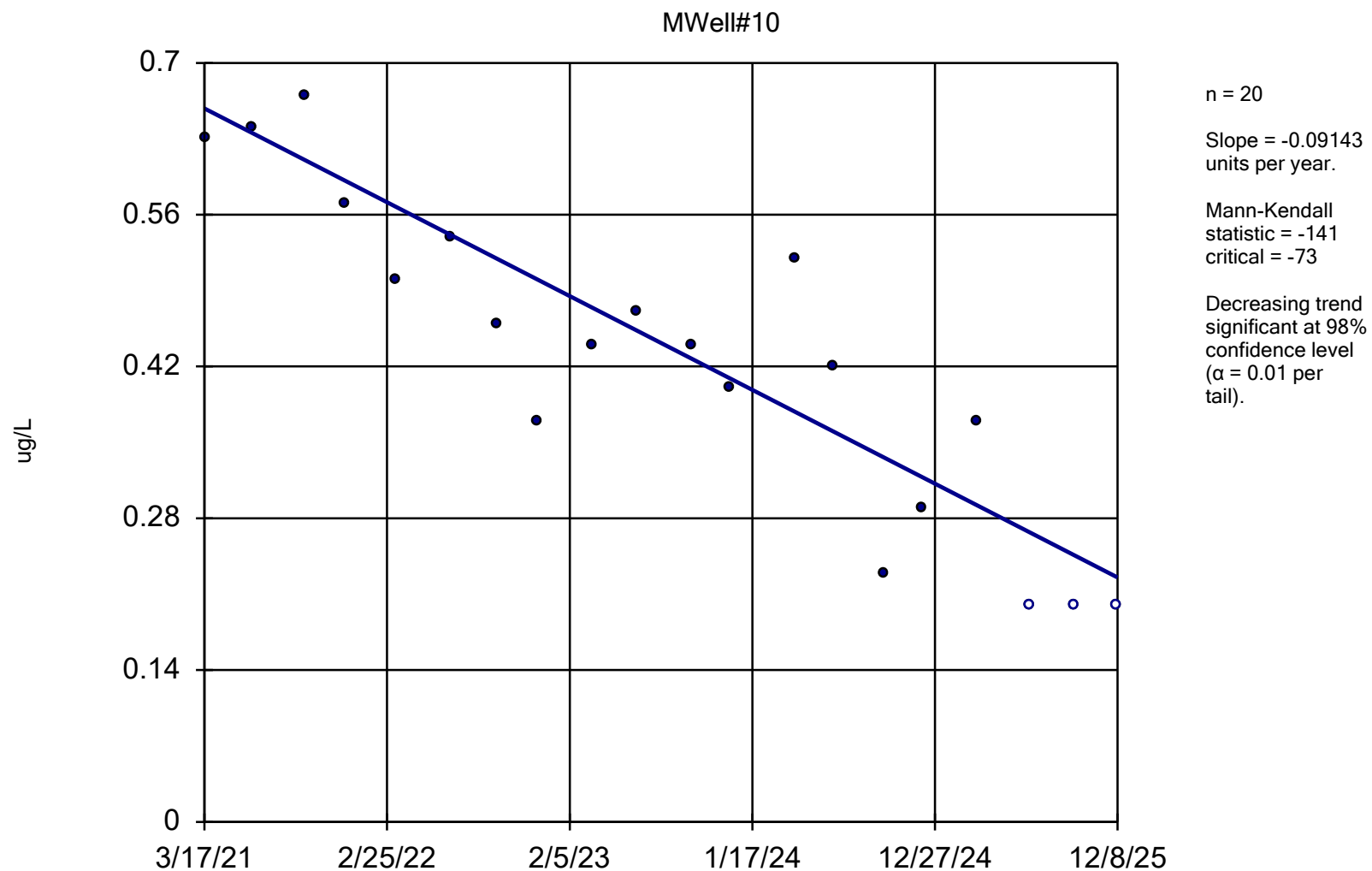
Constituent: 1,2-Dichloropropane Analysis Run 2/13/2026 3:28 PM View: 5 yr trend_part 2

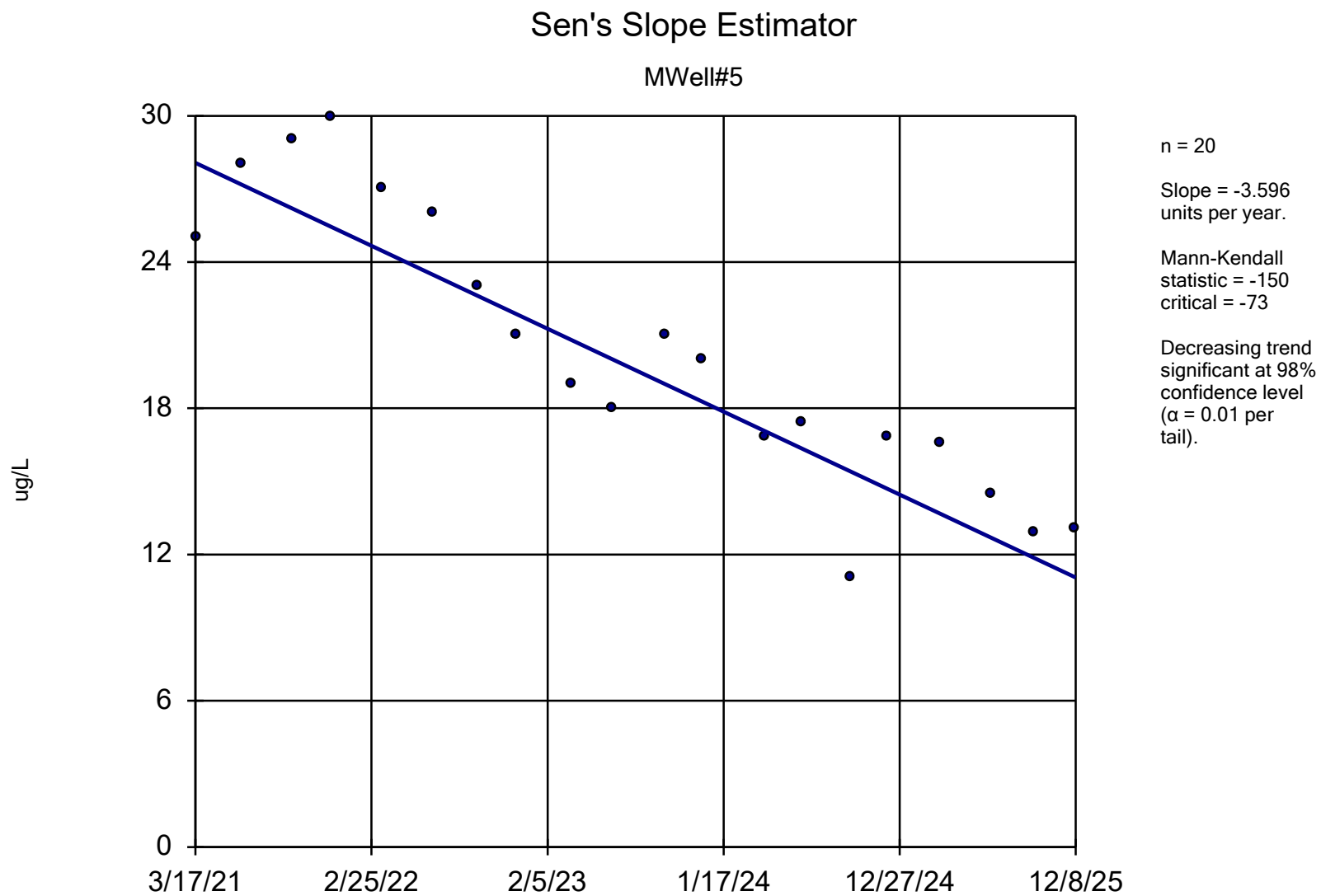
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

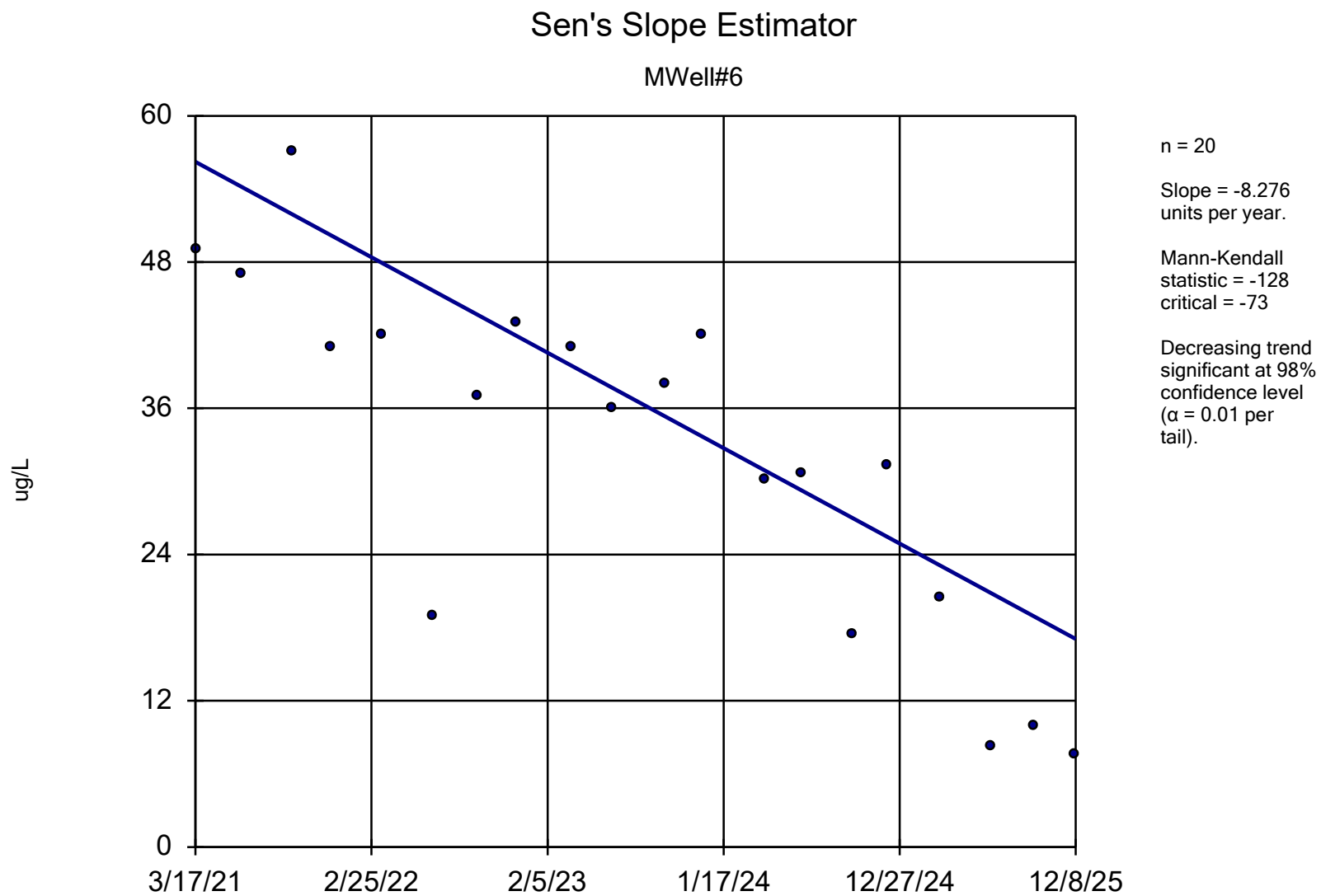


Sen's Slope Estimator

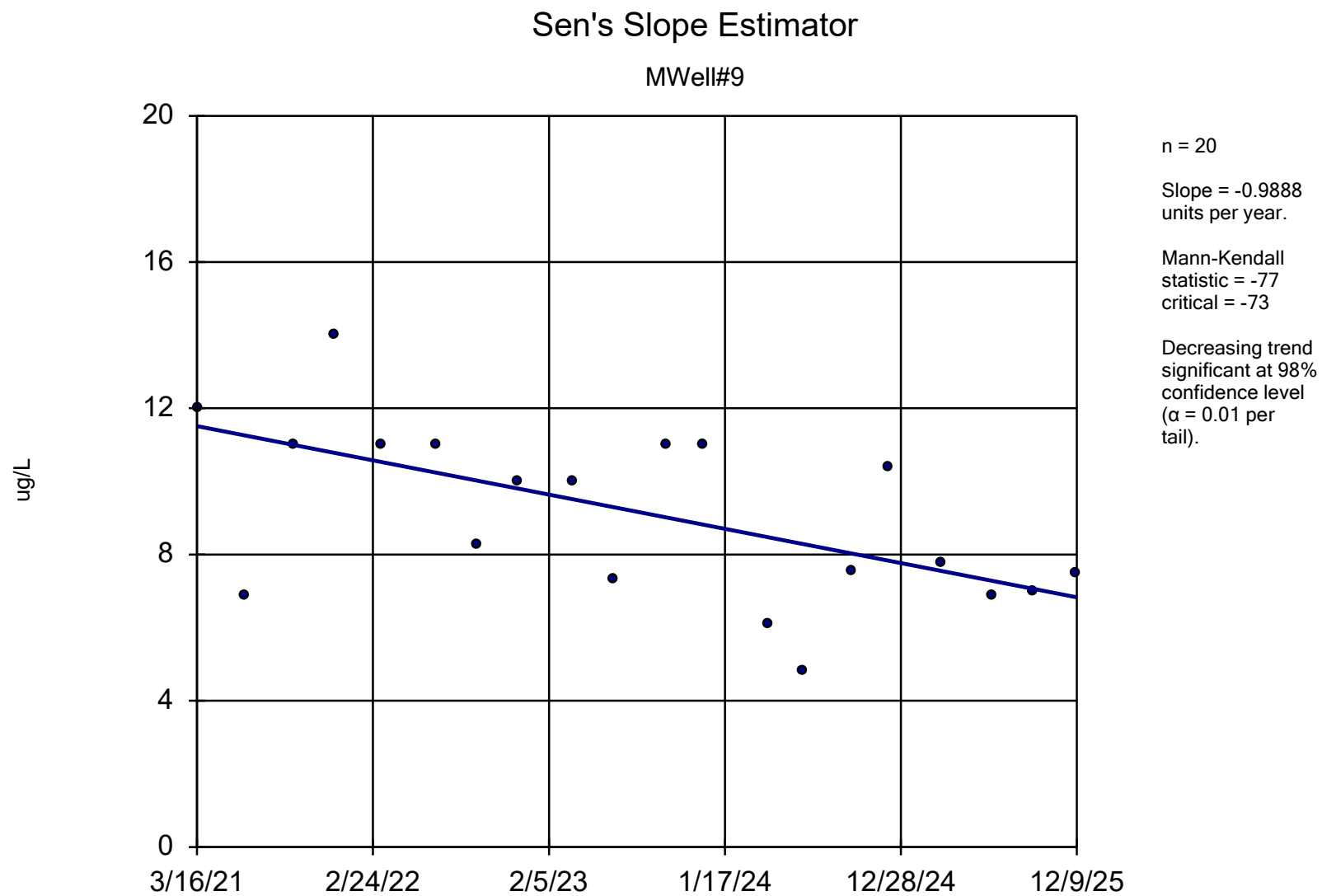


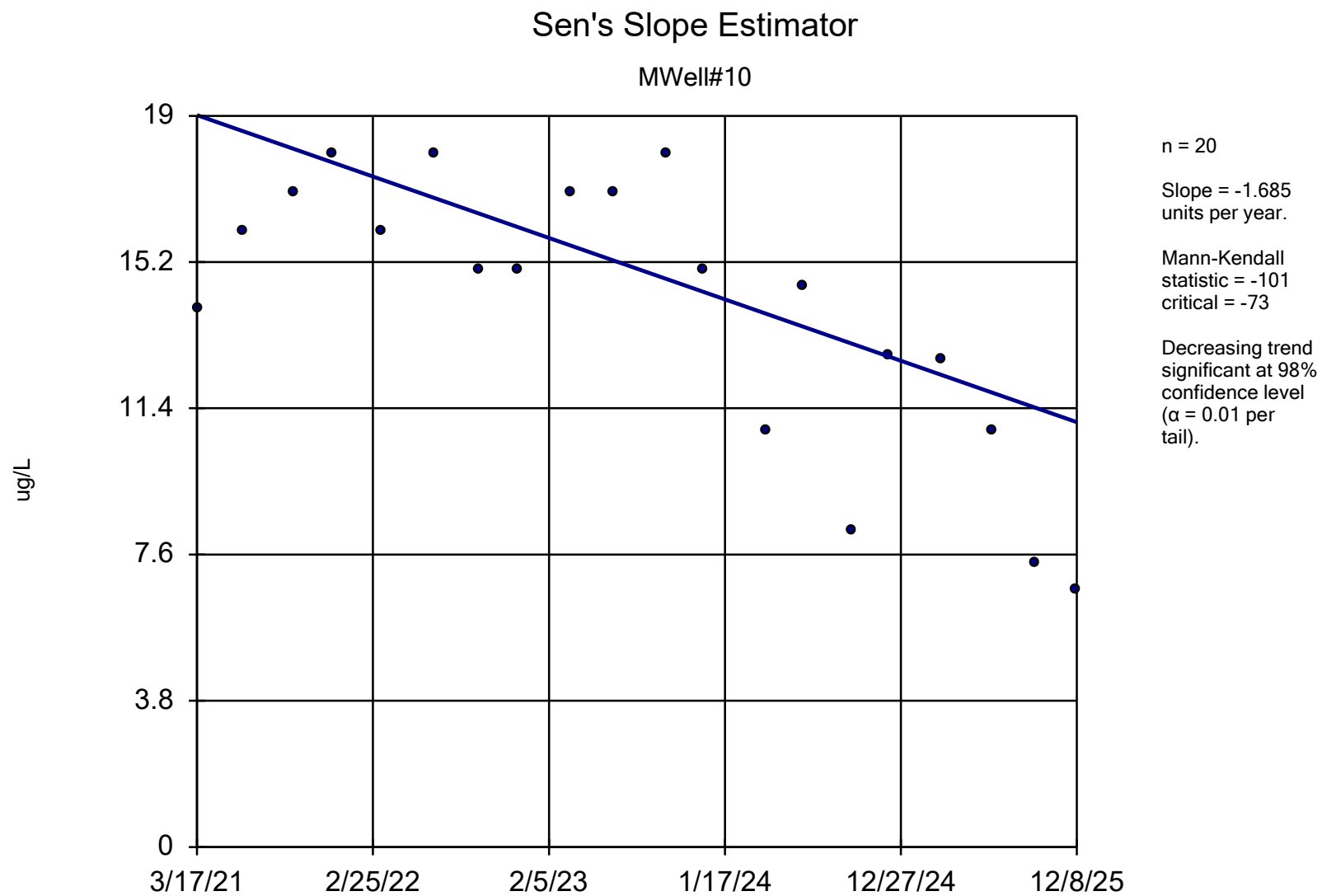


Constituent: cis-1,2-Dichloroethene Analysis Run 2/13/2026 3:28 PM View: 5 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

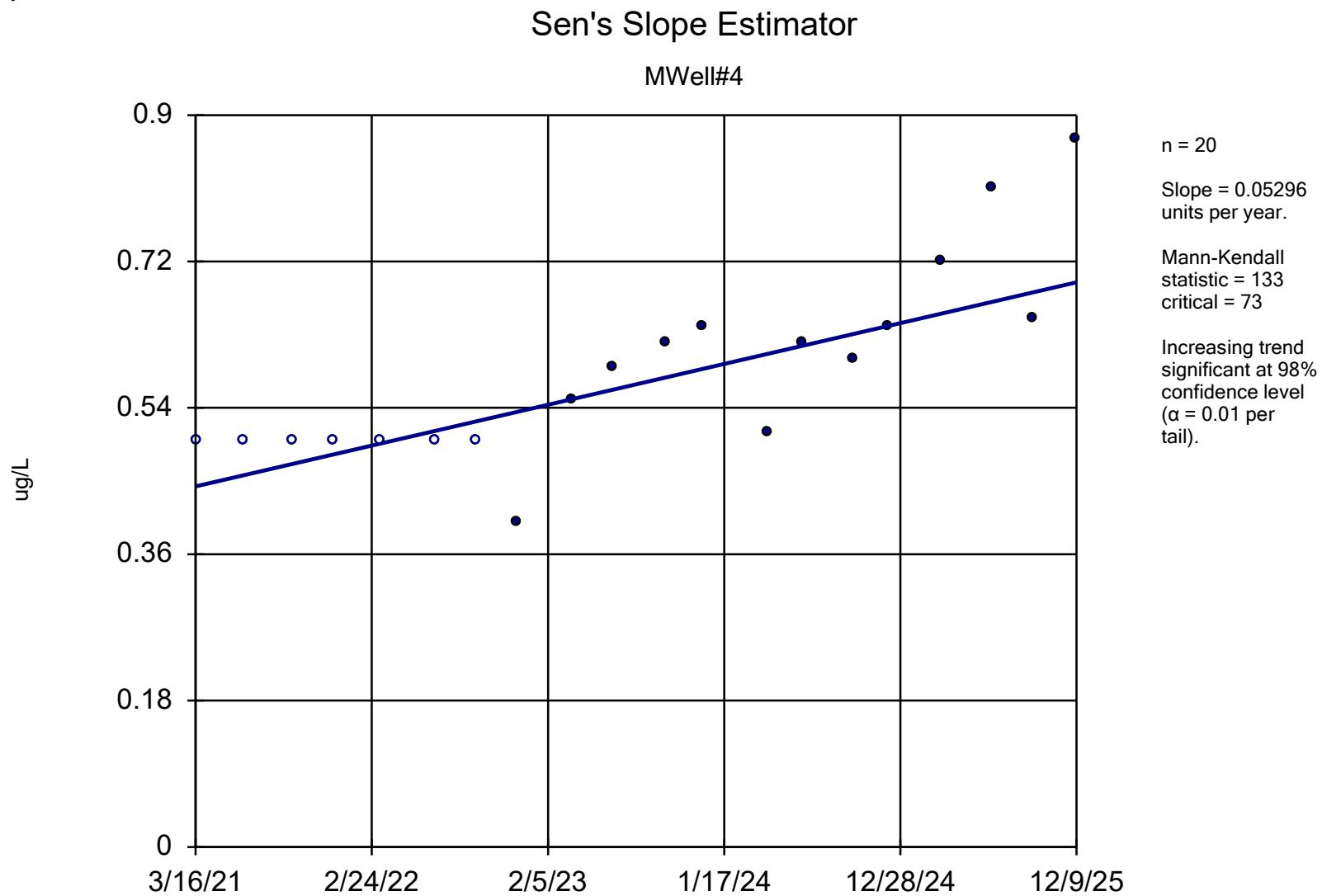


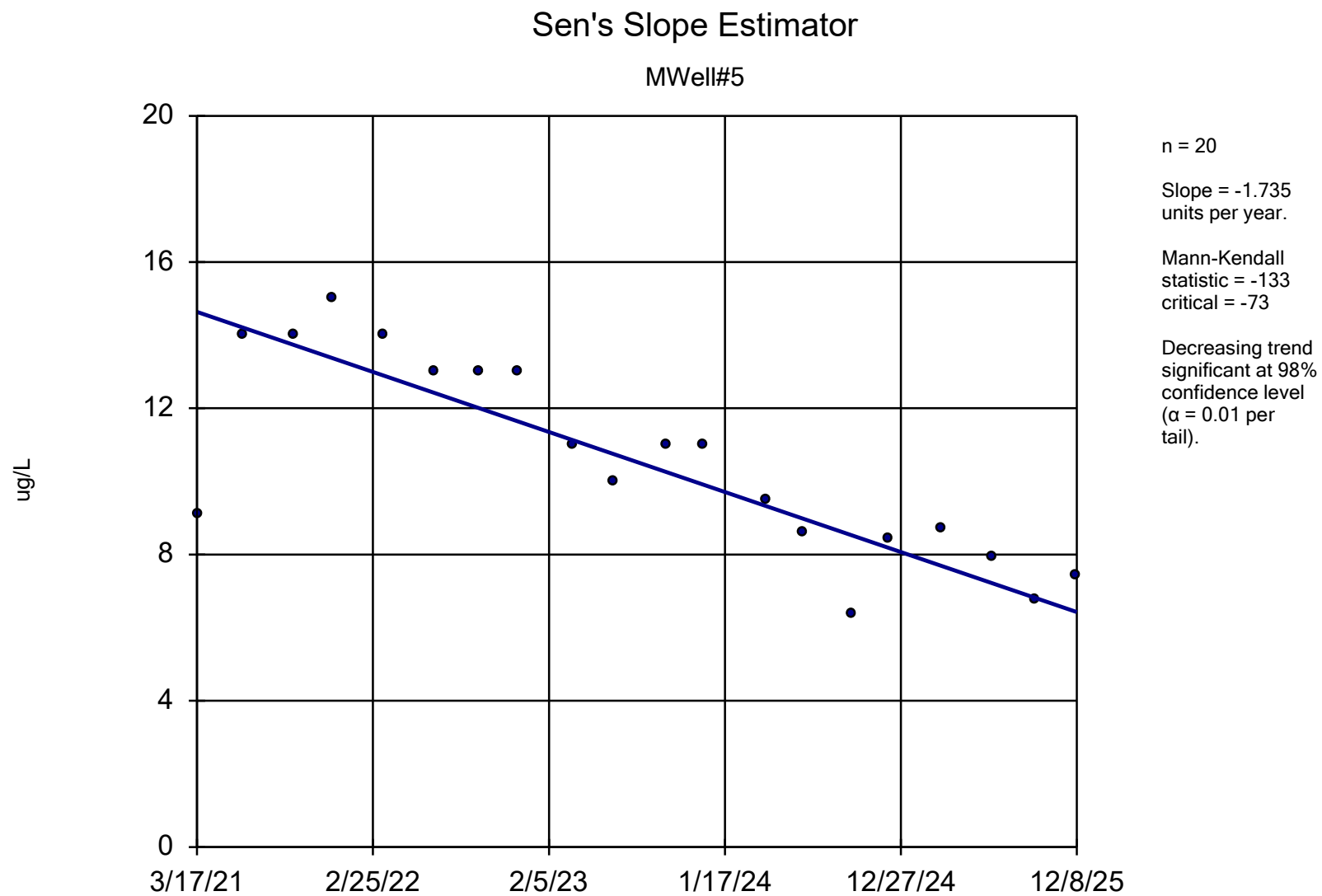
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Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata



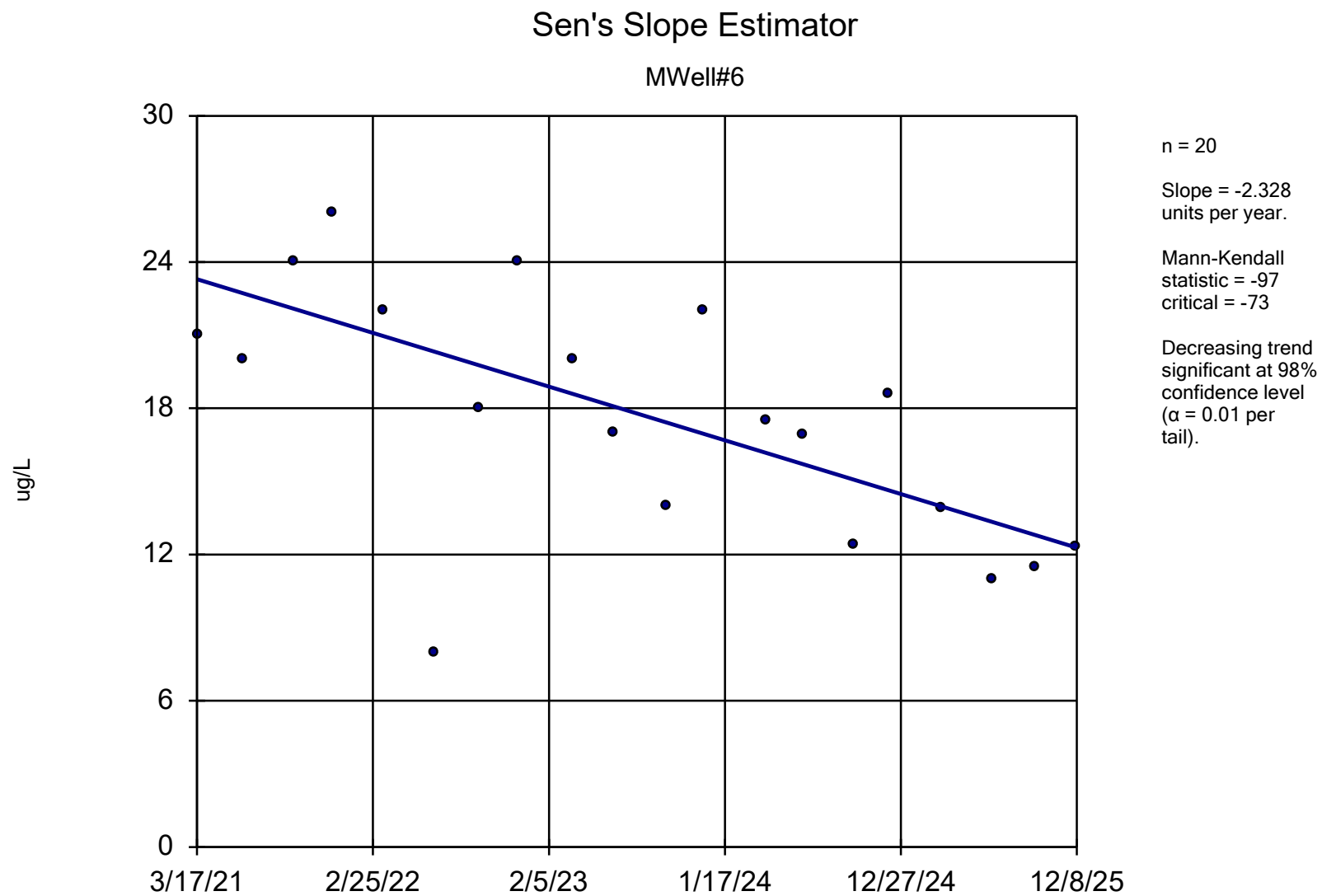


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Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

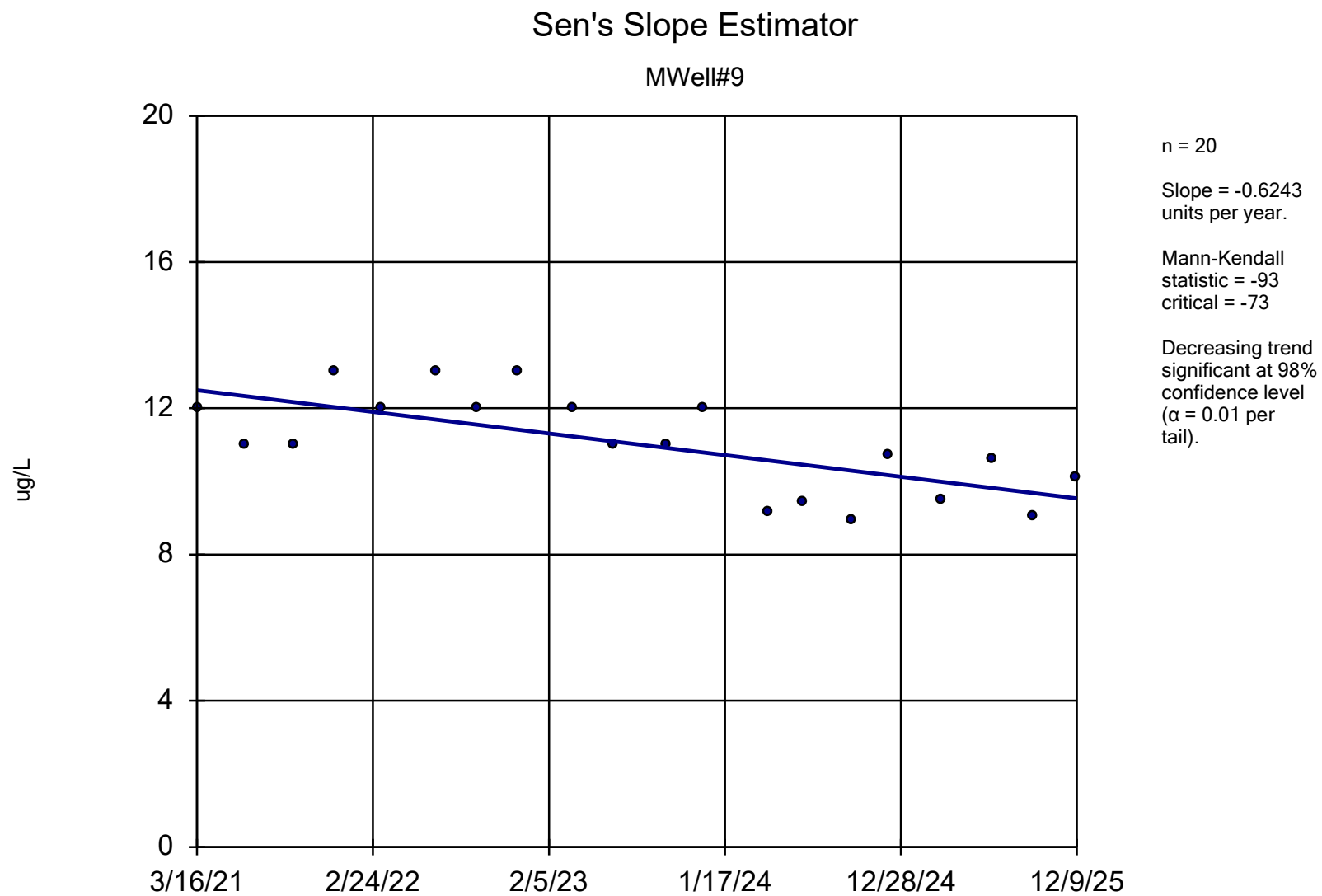




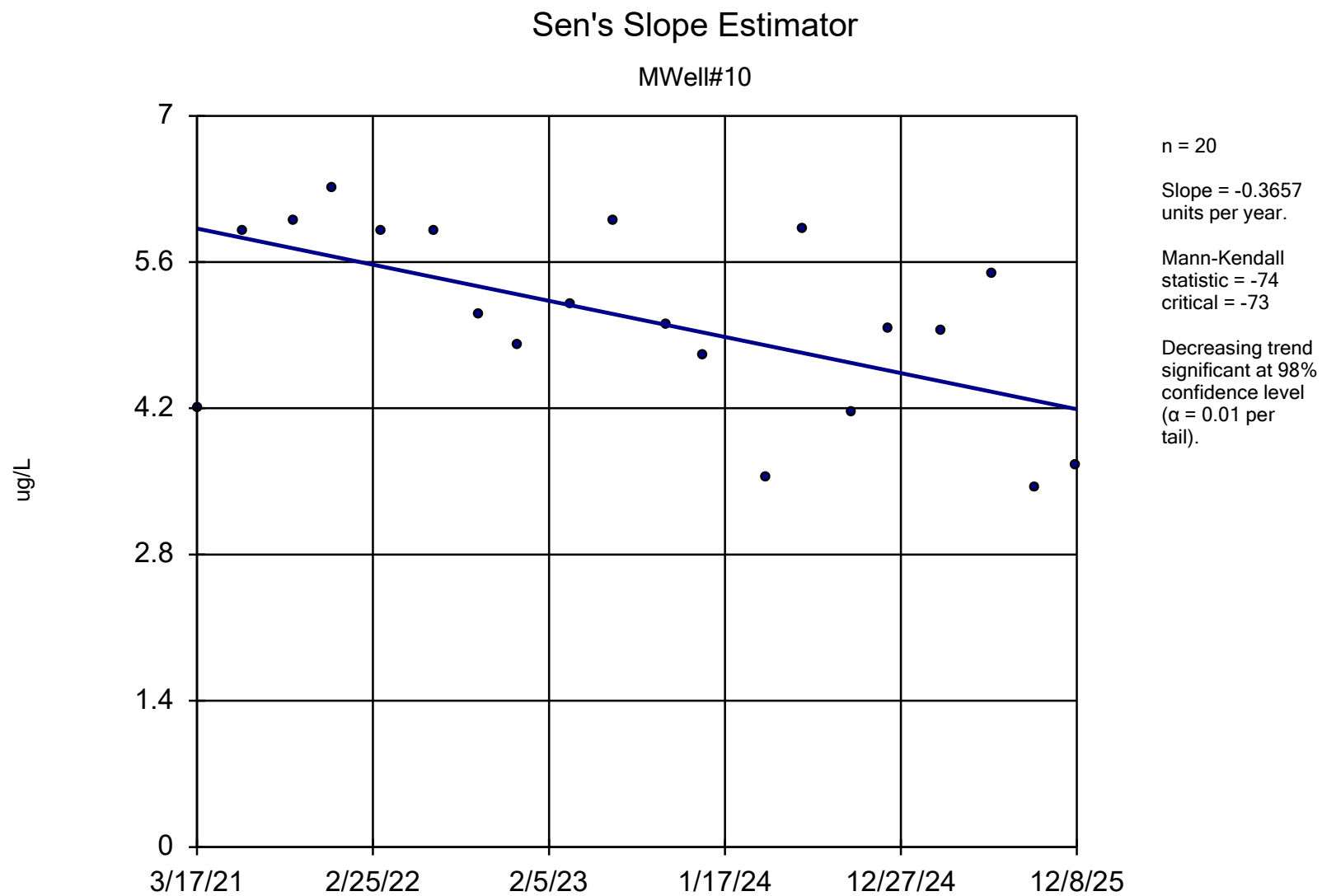
Constituent: Tetrachloroethene Analysis Run 2/13/2026 3:28 PM View: 5 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata



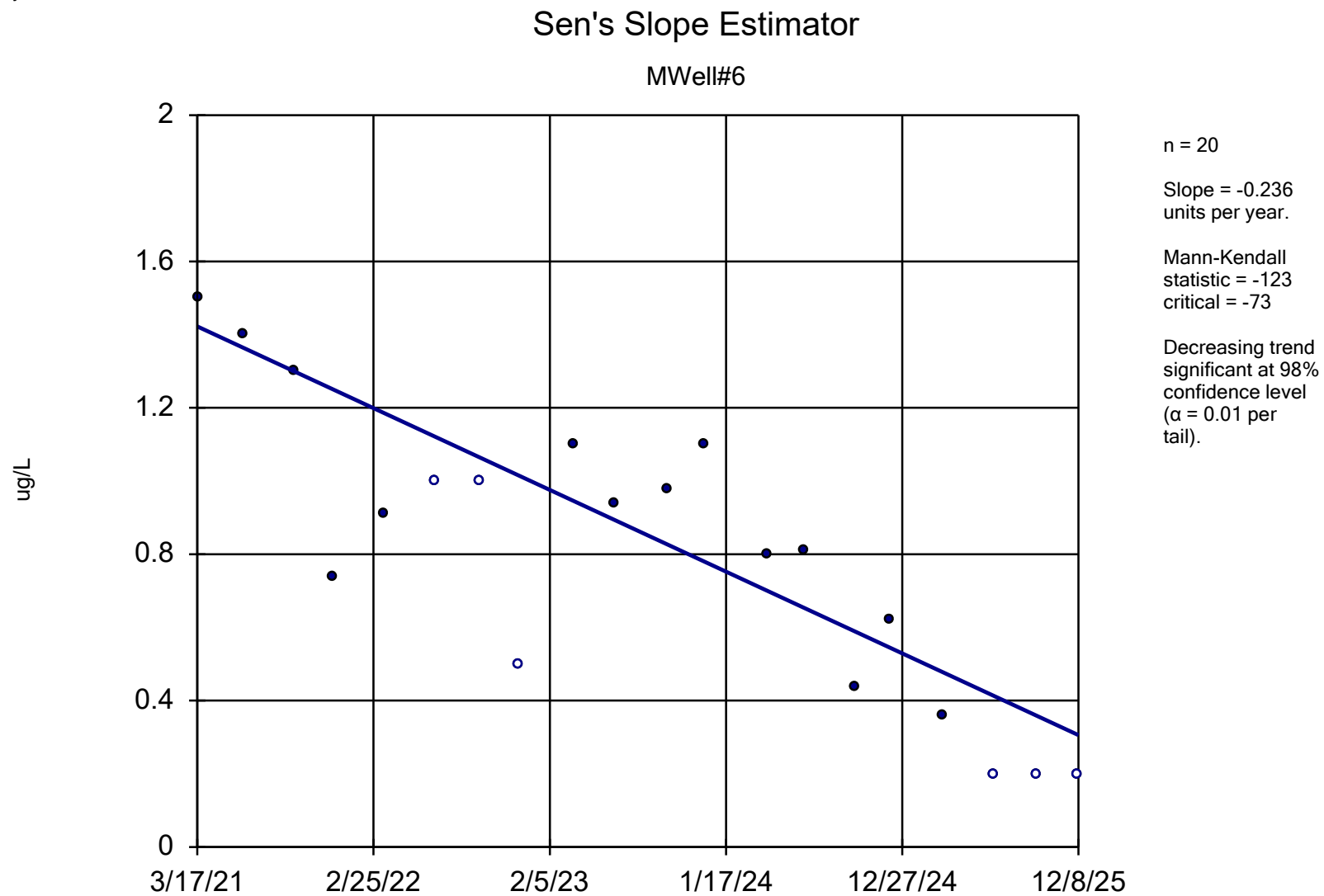
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Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata



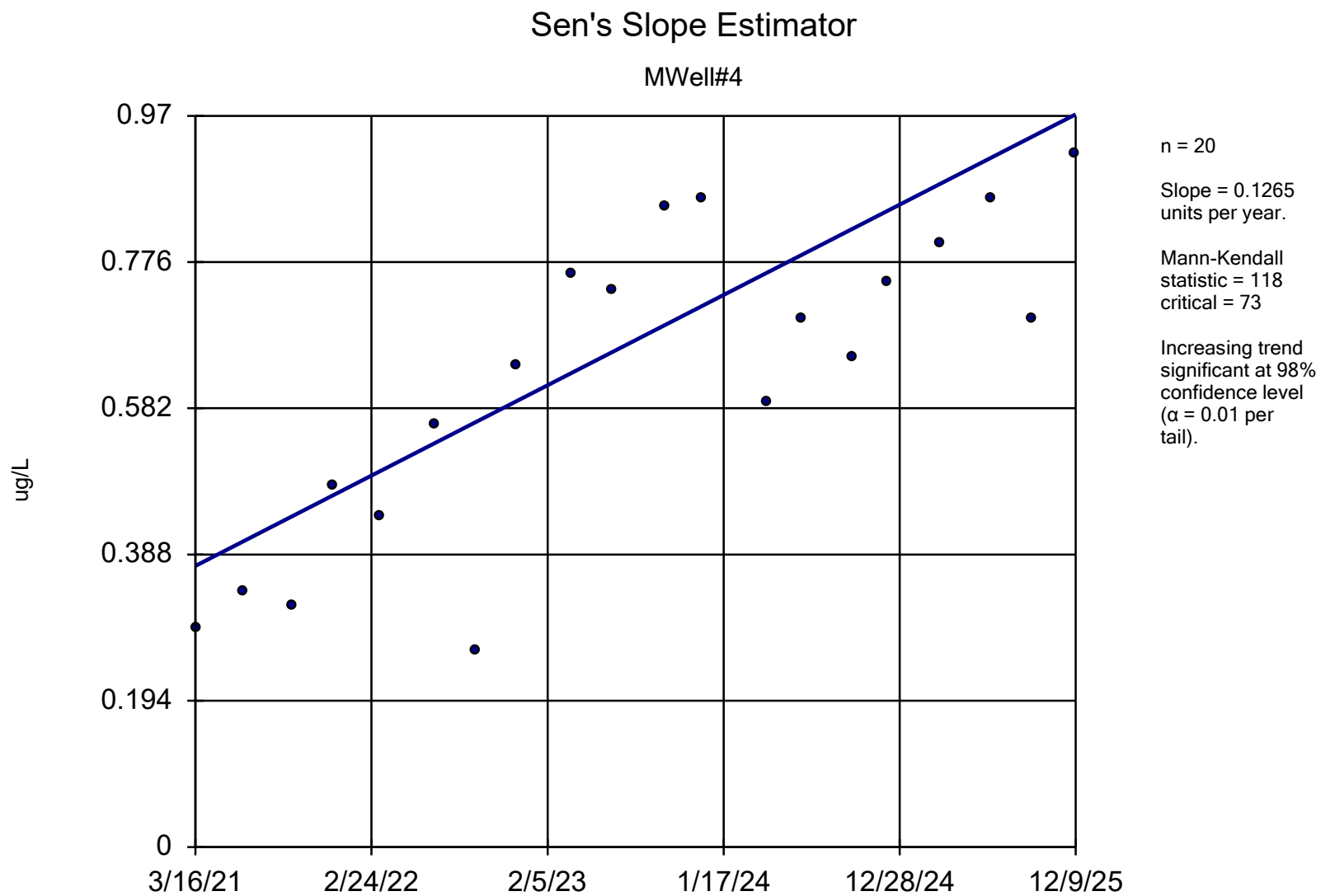
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Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata



Constituent: Tetrachloroethene Analysis Run 2/13/2026 3:28 PM View: 5 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

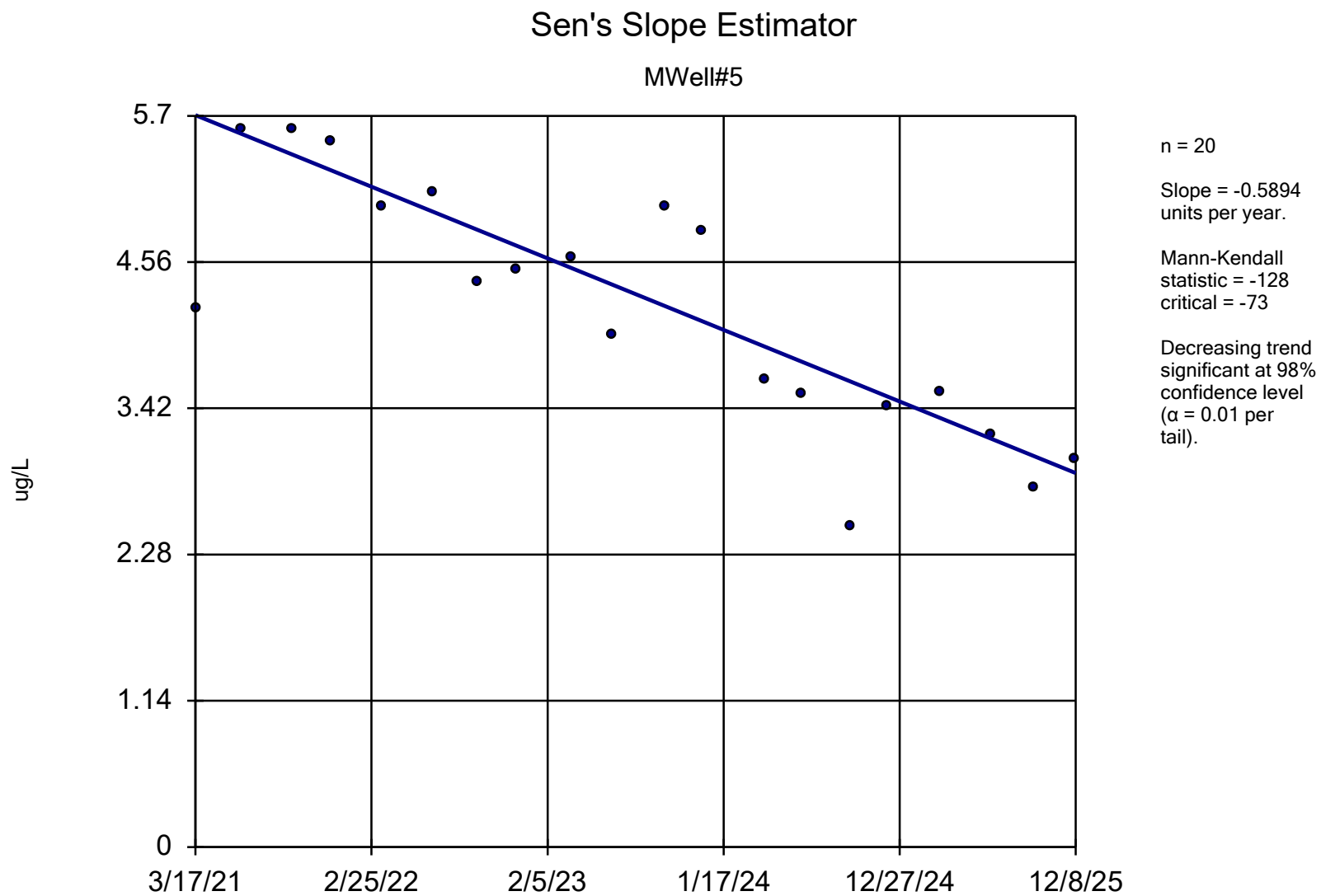


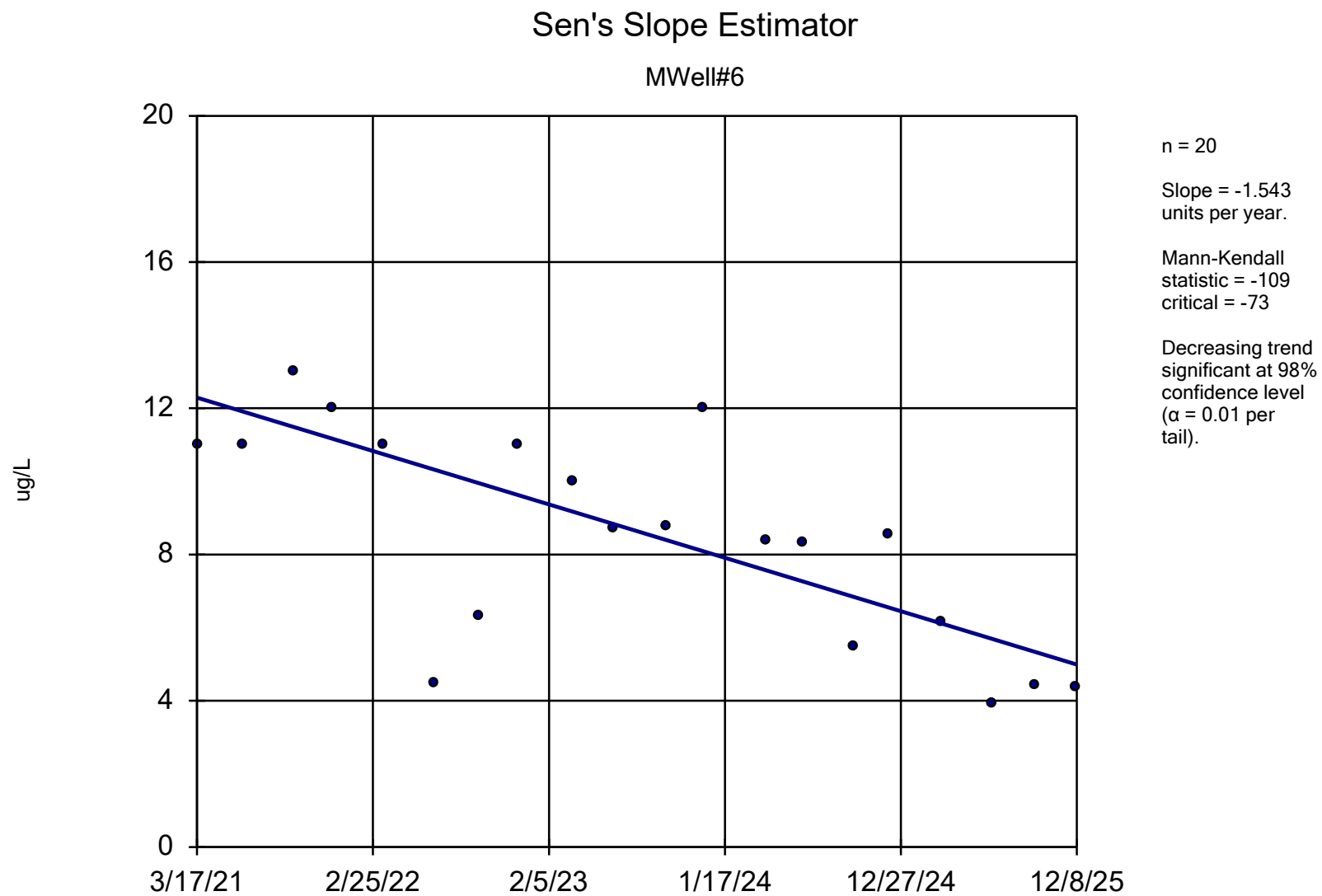
Constituent: trans-1,2-Dichloroethene Analysis Run 2/13/2026 3:28 PM View: 5 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata



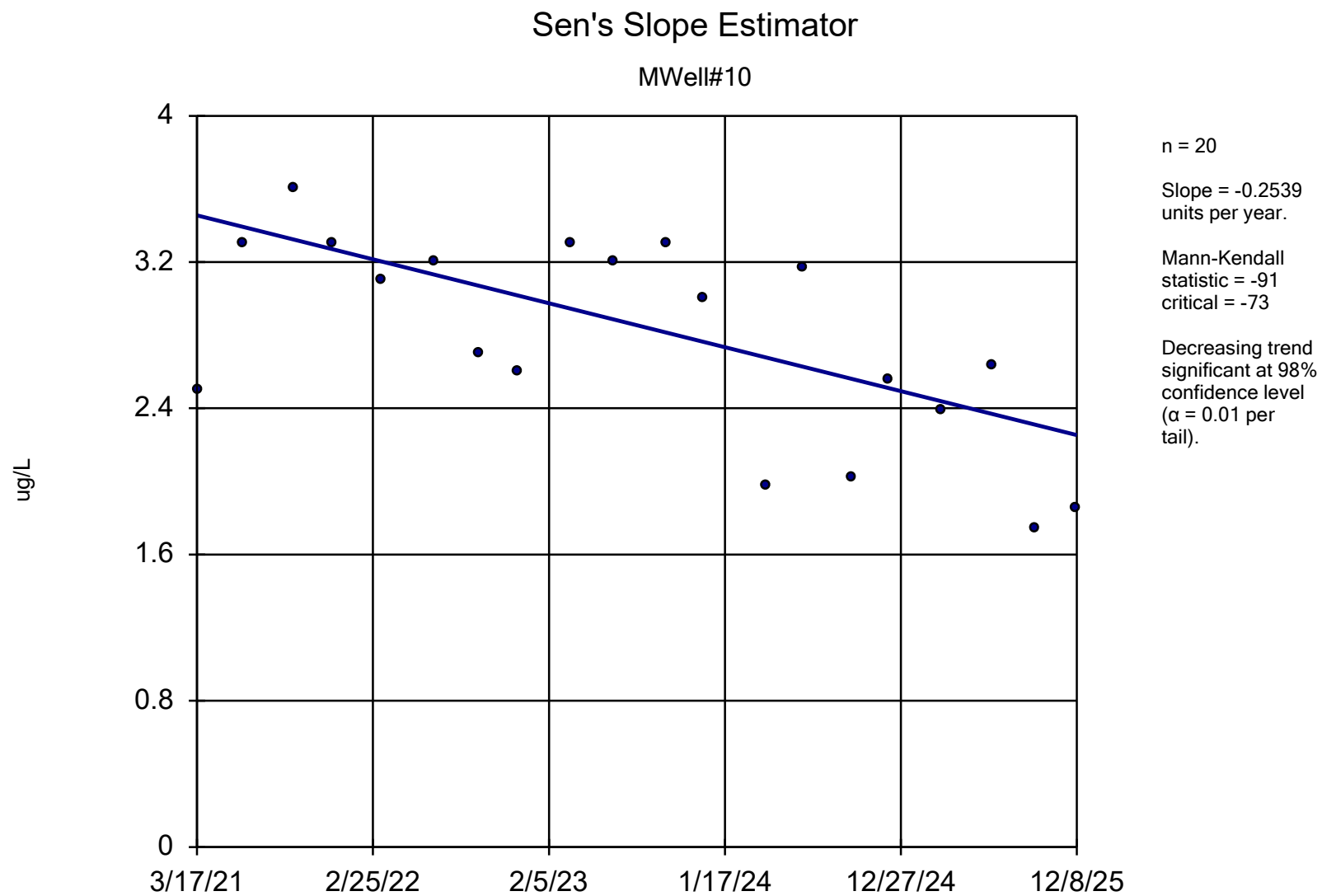
Constituent: Trichloroethene Analysis Run 2/13/2026 3:28 PM View: 5 yr trend_part 2

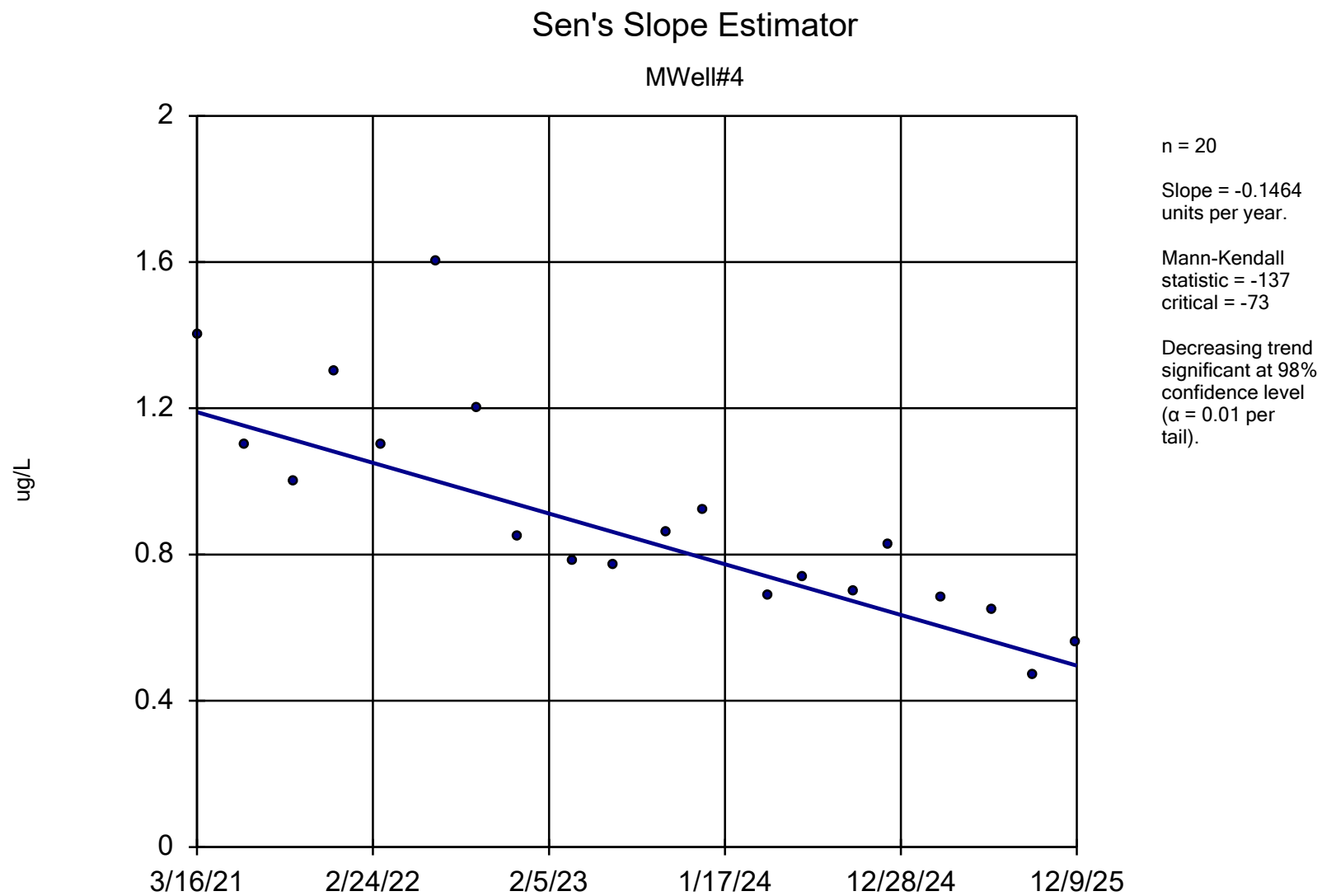
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata





Constituent: Trichloroethene Analysis Run 2/13/2026 3:28 PM View: 5 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

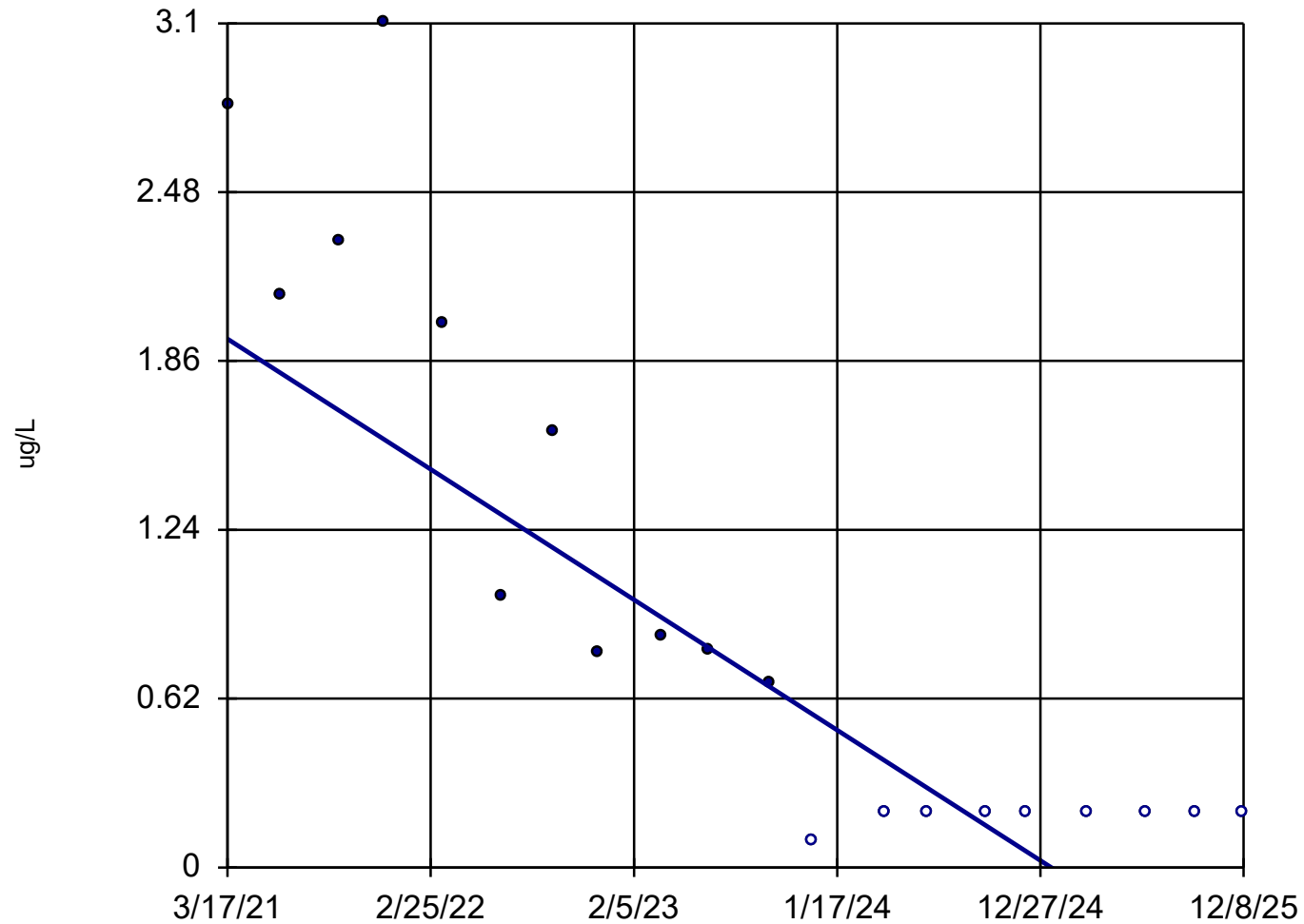




Constituent: Trichlorofluoromethane Analysis Run 2/13/2026 3:28 PM View: 5 yr trend_part 2
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Sen's Slope Estimator

MWWell#6



$n = 20$

Slope = -0.506
units per year.

Mann-Kendall
statistic = -132
critical = -73

Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Vinyl Chloride Analysis Run 2/13/2026 3:29 PM View: 5 yr trend_part 2

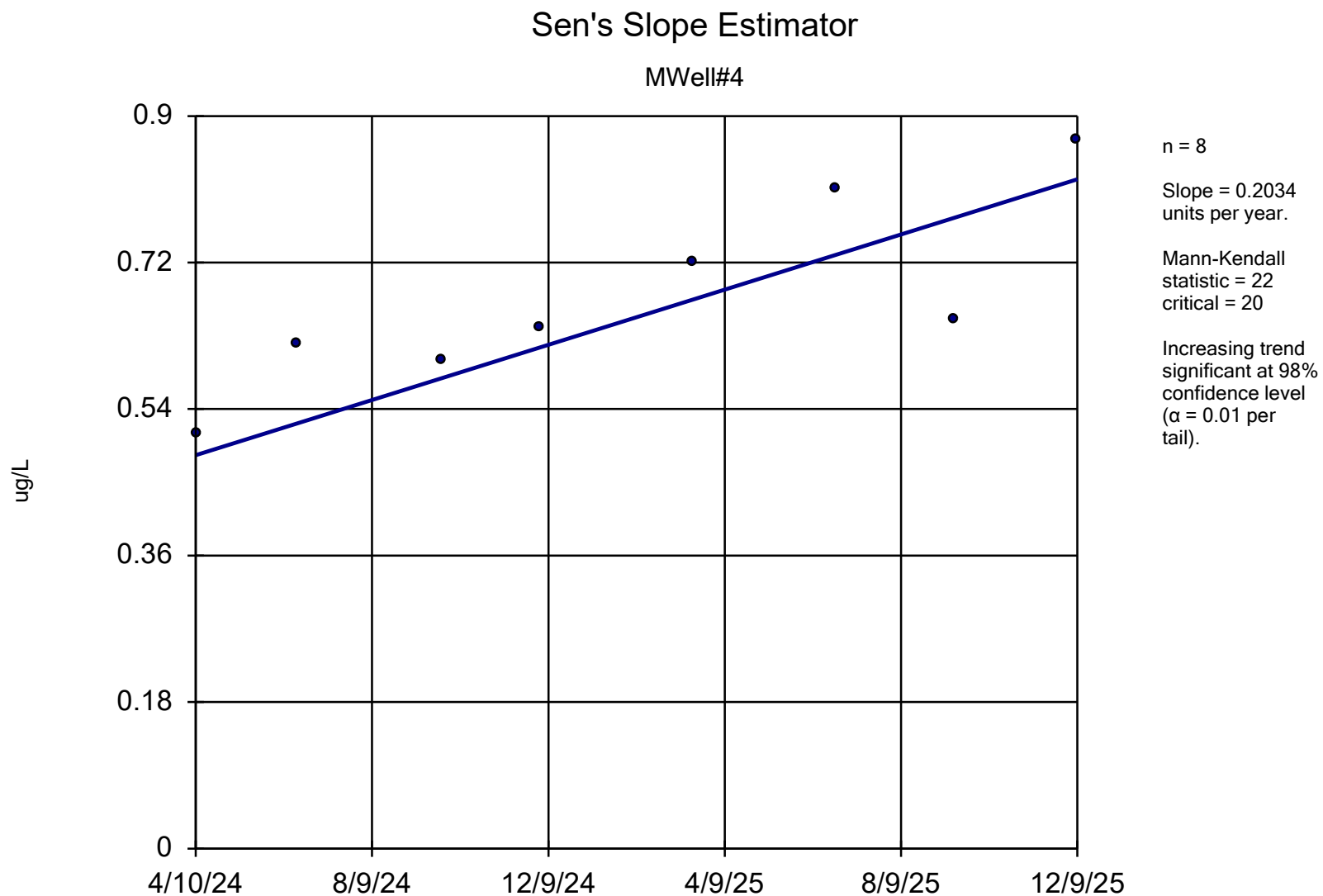
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

D-3

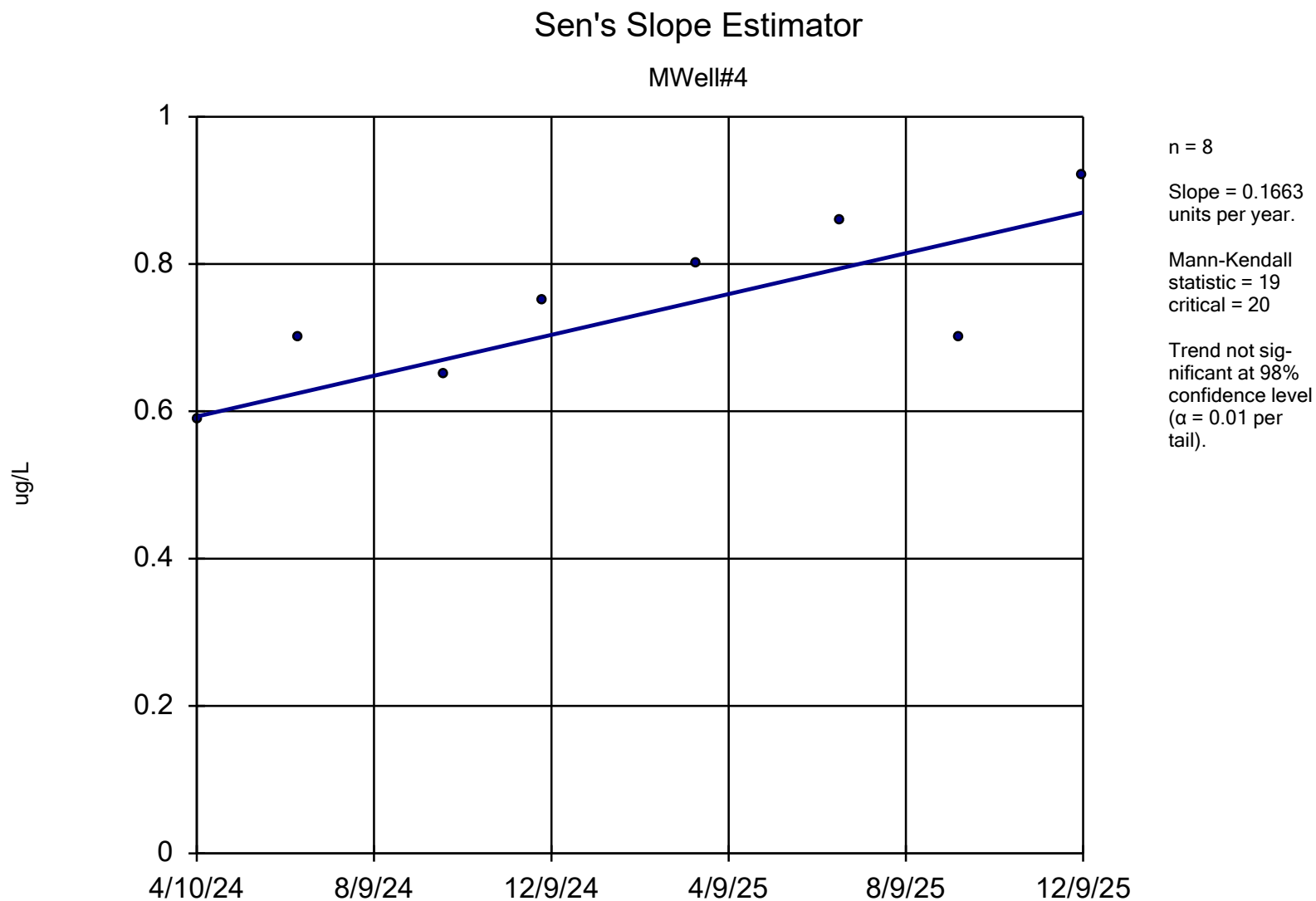
2-Year Trends

Horn Rapids Landfill Trends for Volatile Organic Compounds, First Quarter 2024 through Fourth Quarter 2025

Constituent Name	Well	Slope	Calculated Statistic	Critical Value	Trend	N	% Non-detects	Normality	Transformation	Alpha	Method
Tetrachloroethene (ug/L)	MWell#4	0.2034	22	20	Yes	8	0	n/a	n/a	0.02	NP
Trichloroethene (ug/L)	MWell#4	0.1663	19	20	No	8	0	n/a	n/a	0.02	NP



Constituent: Tetrachloroethene Analysis Run 2/13/2026 3:16 PM View: 2-year trend
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata



Constituent: Trichloroethene Analysis Run 2/13/2026 3:16 PM View: 2-year trend
Horn Rapids Landfill Client: City of Richland Data: HRLF_alldata

Appendix E

Background Statistical Summary

HORN RAPIDS LANDFILL - FOURTH QUARTER 2025
Summary of Descriptive Statistics

Constituent Name	Well	N	Mean ¹	Variance	Standard Deviation	Standard Error	Coefficient of Variation	Median	% Non-Detects
1,1,1,2-Tetrachloroethane (ug/L)	MWell#1 (bg)	135	0.8861	0.98267569	0.9913	0.08532	1.11872249	0.6	100
1,1,1,2-Tetrachloroethane (ug/L)	MWell#11 (bg)	61	0.4462	0.11282881	0.3359	0.04301	0.75280143	0.3	100
1,1,1-Trichloroethane (ug/L)	MWell#1 (bg)	135	0.8639	1.006009	1.003	0.08629	1.16101401	0.6	100
1,1,1-Trichloroethane (ug/L)	MWell#11 (bg)	61	0.4054	0.12376324	0.3518	0.04505	0.8677849	0.2	100
1,1,2,2-Tetrachloroethane (ug/L)	MWell#1 (bg)	135	0.8684	1.004004	1.002	0.08625	1.15384615	0.6	100
1,1,2,2-Tetrachloroethane (ug/L)	MWell#11 (bg)	61	0.4072	0.12517444	0.3538	0.0453	0.86886051	0.2	100
1,1,2-Trichloroethane (ug/L)	MWell#1 (bg)	135	0.8739	1.014049	1.007	0.08668	1.15230576	0.6	100
1,1,2-Trichloroethane (ug/L)	MWell#11 (bg)	61	0.4028	0.1225	0.35	0.04481	0.86891758	0.2	100
1,1-Dichloroethane (ug/L)	MWell#1 (bg)	135	0.88	1.004004	1.002	0.08627	1.13863636	0.7	96.3
1,1-Dichloroethane (ug/L)	MWell#11 (bg)	61	0.4197	0.14561856	0.3816	0.04886	0.90922087	0.2	100
1,1-Dichloroethene (ug/L)	MWell#1 (bg)	135	1.063	2.247001	1.499	0.129	1.41015992	0.91	100
1,1-Dichloroethene (ug/L)	MWell#11 (bg)	61	0.3903	0.135424	0.368	0.04711	0.94286446	0.2	100
1,2,3-Trichloropropane (ug/L)	MWell#1 (bg)	135	0.9545	1.597696	1.264	0.1088	1.32425354	0.6	100
1,2,3-Trichloropropane (ug/L)	MWell#11 (bg)	61	0.4452	0.11607649	0.3407	0.04362	0.76527403	0.2	100
1,2-Dibromo-3-chloropropane (ug/L)	MWell#1 (bg)	133	2.734	6.1504	2.48	0.2151	0.90709583	2	100
1,2-Dibromo-3-chloropropane (ug/L)	MWell#11 (bg)	61	1.713	0.34845409	0.5903	0.07558	0.34460012	2	100
1,2-Dibromoethane (ug/L)	MWell#1 (bg)	134	0.9053	1.677025	1.295	0.1118	1.43046504	0.55	100
1,2-Dibromoethane (ug/L)	MWell#11 (bg)	61	0.3428	0.14714896	0.3836	0.04911	1.11901984	0.1	100
1,2-Dichlorobenzene (ug/L)	MWell#1 (bg)	134	1.05	2.202256	1.484	0.1282	1.41333333	1	99.25
1,2-Dichlorobenzene (ug/L)	MWell#11 (bg)	61	0.4852	0.13264164	0.3642	0.04663	0.7506183	0.3	100
1,2-Dichloroethane (ug/L)	MWell#1 (bg)	134	0.8993	1.048576	1.024	0.08848	1.1386634	0.6	100
1,2-Dichloroethane (ug/L)	MWell#11 (bg)	61	0.4115	0.13003236	0.3606	0.04617	0.8763062	0.2	100
1,2-Dichloropropane (ug/L)	MWell#1 (bg)	131	0.9414	1.125721	1.061	0.09273	1.12704483	0.5	100
1,2-Dichloropropane (ug/L)	MWell#11 (bg)	61	0.4085	0.12645136	0.3556	0.04553	0.87050184	0.2	100
1,4-Dichlorobenzene (ug/L)	MWell#1 (bg)	134	1.05	2.205225	1.485	0.1283	1.41428571	1	99.25
1,4-Dichlorobenzene (ug/L)	MWell#11 (bg)	61	0.4869	0.13749264	0.3708	0.04748	0.76155268	0.3	100
2-Butanone (ug/L)	MWell#1 (bg)	129	9.29	62.758084	7.922	0.6975	0.85274489	10	97.67
2-Butanone (ug/L)	MWell#11 (bg)	61	9.836	12.103441	3.479	0.4455	0.35370069	10	100
2-Hexanone (ug/L)	MWell#1 (bg)	129	4.895	14.653584	3.828	0.337	0.78202247	5	99.22
2-Hexanone (ug/L)	MWell#11 (bg)	61	3.5	1.750329	1.323	0.1694	0.378	3	100
4-Methyl-2-pentanone (ug/L)	MWell#1 (bg)	128	5.447	9.585216	3.096	0.2736	0.56838627	5	100
4-Methyl-2-pentanone (ug/L)	MWell#11 (bg)	61	5.992	6.280036	2.506	0.3208	0.4182243	5	100
Acetone (ug/L)	MWell#1 (bg)	131	14.66	4602.2656	67.84	5.927	4.62755798	6	95.42
Acetone (ug/L)	MWell#11 (bg)	61	6.839	11.082241	3.329	0.4262	0.48676707	6	100
Acetylene (ug/L)	MWell#1 (bg)	4	1.06	0	0	0	0	1.06	100
Acetylene (ug/L)	MWell#11 (bg)	4	1.06	0	0	0	0	1.06	100
Acrylonitrile (ug/L)	MWell#1 (bg)	129	5.56	21.855625	4.675	0.4116	0.84082734	5	100
Acrylonitrile (ug/L)	MWell#11 (bg)	61	6.43	11.363641	3.371	0.4317	0.52426128	5	100
Alkalinity, Bicarbonate (mg/L)	MWell#1 (bg)	125	294.3	4024.6336	63.44	5.674	0.21556235	300	0
Alkalinity, Bicarbonate (mg/L)	MWell#11 (bg)	61	177.6	287.9809	16.97	2.173	0.0955518	170	0
Alkalinity, Total (mg/L)	MWell#1 (bg)	125	285.8	4767.9025	69.05	6.176	0.24160252	290	0
Alkalinity, Total (mg/L)	MWell#11 (bg)	61	177.6	287.9809	16.97	2.173	0.0955518	170	0
Ammonia Nitrogen (mg/L)	MWell#1 (bg)	134	0.1514	0.03006756	0.1734	0.01498	1.14531044	0.1	79.85
Ammonia Nitrogen (mg/L)	MWell#11 (bg)	61	0.2731	0.06589489	0.2567	0.03286	0.93994874	0.2	93.44
Antimony, Dissolved (mg/L)	MWell#1 (bg)	84	0.01785	0.00143338	0.03786	0.004131	2.1210084	0.001	95.24
Antimony, Dissolved (mg/L)	MWell#11 (bg)	21	0.0004	0	0	0	0	0.0004	100
Antimony, Total (mg/L)	MWell#1 (bg)	50	0.0006	5.5507E-08	0.0002356	3.332E-05	0.39266667	0.0004	100
Antimony, Total (mg/L)	MWell#11 (bg)	49	0.000618	1.0844E-07	0.0003293	4.705E-05	0.5328479	0.0004	97.96
Arsenic, Dissolved (mg/L)	MWell#1 (bg)	85	0.01001	0.00018442	0.01358	0.001473	1.35664336	0.005	15.29
Arsenic, Dissolved (mg/L)	MWell#11 (bg)	21	0.004729	7.5812E-07	0.0008707	0.00019	0.18411926	0.0049	0
Arsenic, Total (mg/L)	MWell#1 (bg)	50	0.004218	1.7497E-07	0.0004183	5.916E-05	0.09917022	0.00415	0
Arsenic, Total (mg/L)	MWell#11 (bg)	49	0.004894	1.5277E-06	0.001236	0.0001765	0.25255415	0.0046	0
Barium, Dissolved (mg/L)	MWell#1 (bg)	85	0.04711	0.00030485	0.01746	0.001894	0.37062195	0.05	9.412
Barium, Dissolved (mg/L)	MWell#11 (bg)	21	0.08352	0.00025985	0.01612	0.003518	0.19300766	0.08	0
Barium, Total (mg/L)	MWell#1 (bg)	50	0.054	7.7616E-05	0.00881	0.001246	0.16314815	0.054	0
Barium, Total (mg/L)	MWell#11 (bg)	49	0.102	0.00017398	0.01319	0.001884	0.12931373	0.1	0
Benzene (ug/L)	MWell#1 (bg)	135	0.8963	1.042441	1.021	0.08787	1.13912752	0.6	100
Benzene (ug/L)	MWell#11 (bg)	61	0.5277	0.34527376	0.5876	0.07523	1.11351146	0.2	88.52
Beryllium, Dissolved (mg/L)	MWell#1 (bg)	85	0.001263	1.5725E-06	0.001254	0.000136	0.99287411	0.001	100

¹ All statistics based on Non-Detects = 1/2 MDL ² (bg) indicates a background well.

HORN RAPIDS LANDFILL - FOURTH QUARTER 2025
Summary of Descriptive Statistics

Constituent Name	Well	N	Mean ¹	Variance	Standard Deviation	Standard Error	Coefficient of Variation	Median	% Non-Detects
Beryllium, Dissolved (mg/L)	MWell#11 (bg)	21	0.0004	0	0	0	0	0.0004	100
Beryllium, Total (mg/L)	MWell#1 (bg)	50	0.000472	3.8809E-08	0.000197	2.785E-05	0.41737288	0.0004	100
Beryllium, Total (mg/L)	MWell#11 (bg)	49	0.000461	3.3672E-08	0.0001835	2.621E-05	0.39787511	0.0004	100
Bromochloromethane (ug/L)	MWell#1 (bg)	134	0.8731	1.012036	1.006	0.08687	1.15221624	0.8	99.25
Bromochloromethane (ug/L)	MWell#11 (bg)	61	0.4197	0.13557124	0.3682	0.04715	0.8772933	0.2	100
Bromodichloromethane (ug/L)	MWell#1 (bg)	135	0.8689	1.004004	1.002	0.08625	1.15318218	0.6	100
Bromodichloromethane (ug/L)	MWell#11 (bg)	61	0.4082	0.12609601	0.3551	0.04547	0.86991671	0.2	100
Bromoform (ug/L)	MWell#1 (bg)	135	0.9496	0.92275236	0.9606	0.08267	1.01158382	0.6	100
Bromoform (ug/L)	MWell#11 (bg)	61	0.5869	0.09351364	0.3058	0.03915	0.52104277	0.5	100
Bromomethane (ug/L)	MWell#1 (bg)	133	1.992	5.438224	2.332	0.2022	1.17068273	1	99.25
Bromomethane (ug/L)	MWell#11 (bg)	61	1.772	3.549456	1.884	0.2412	1.06320542	1	100
Cadmium, Dissolved (mg/L)	MWell#1 (bg)	85	0.002135	5.978E-06	0.002445	0.0002652	1.14519906	0.001	98.82
Cadmium, Dissolved (mg/L)	MWell#11 (bg)	21	0.0004	0	0	0	0	0.0004	100
Cadmium, Total (mg/L)	MWell#1 (bg)	50	0.000436	1.4593E-08	0.0001208	1.709E-05	0.27706422	0.0004	100
Cadmium, Total (mg/L)	MWell#11 (bg)	49	0.000435	1.4811E-08	0.0001217	1.739E-05	0.27996319	0.0004	100
Calcium, Dissolved (mg/L)	MWell#1 (bg)	124	101.1	908.4196	30.14	2.707	0.29812067	110	0
Calcium, Dissolved (mg/L)	MWell#11 (bg)	61	220.8	3782.25	61.5	7.874	0.27853261	250	0
Calcium, Total (mg/L)	MWell#1 (bg)	8	118.3	430.1476	20.74	7.333	0.17531699	120	0
Calcium, Total (mg/L)	MWell#11 (bg)	8	182.5	1164.1744	34.12	12.06	0.1869589	200	0
Carbon Disulfide (ug/L)	MWell#1 (bg)	129	3.698	159.5169	12.63	1.112	3.41535965	1	98.45
Carbon Disulfide (ug/L)	MWell#11 (bg)	61	0.459	0.12348196	0.3514	0.04499	0.76557734	0.3	100
Carbon Tetrachloride (ug/L)	MWell#1 (bg)	134	0.9119	1.069156	1.034	0.08932	1.13389626	0.55	100
Carbon Tetrachloride (ug/L)	MWell#11 (bg)	61	0.4148	0.13527684	0.3678	0.04709	0.88669238	0.2	100
Carbonate (mg/L)	MWell#1 (bg)	8	6.875	6.697744	2.588	0.9149	0.37643636	5	100
Chloride (mg/L)	MWell#1 (bg)	136	20.34	103.2256	10.16	0.8709	0.49950836	22	0
Chloride (mg/L)	MWell#11 (bg)	61	164.7	5349.4596	73.14	9.365	0.44408015	200	0
Chlorobenzene (ug/L)	MWell#1 (bg)	135	0.8696	1.004004	1.002	0.08625	1.15225391	0.6	100
Chlorobenzene (ug/L)	MWell#11 (bg)	61	0.4098	0.12787776	0.3576	0.04579	0.87262079	0.2	100
Chloroethane (ug/L)	MWell#1 (bg)	135	1.751	5.546025	2.355	0.2026	1.34494575	0.6	100
Chloroethane (ug/L)	MWell#11 (bg)	61	1.573	3.916441	1.979	0.2534	1.25810553	0.5	100
Chloroform (ug/L)	MWell#1 (bg)	135	0.8716	1.016064	1.008	0.08672	1.1564938	1	94.07
Chloroform (ug/L)	MWell#11 (bg)	61	0.4311	0.17380561	0.4169	0.05338	0.96706101	0.2	98.36
Chloromethane (ug/L)	MWell#1 (bg)	133	1.92	5.963364	2.442	0.2117	1.271875	1	99.25
Chloromethane (ug/L)	MWell#11 (bg)	61	1.575	3.924361	1.981	0.2536	1.25777778	0.5	100
Chromium, Dissolved (mg/L)	MWell#1 (bg)	85	0.006041	5.5667E-05	0.007461	0.0008093	1.23506042	0.0036	30.59
Chromium, Dissolved (mg/L)	MWell#11 (bg)	21	0.004514	2.2801E-06	0.00151	0.0003295	0.33451484	0.0042	0
Chromium, Total (mg/L)	MWell#1 (bg)	50	0.003768	1.974E-06	0.001405	0.0001987	0.37287686	0.00349	12
Chromium, Total (mg/L)	MWell#11 (bg)	49	0.009129	0.00011004	0.01049	0.001499	1.14908533	0.0048	2.041
cis-1,2-Dichloroethene (ug/L)	MWell#1 (bg)	135	0.9074	1.199025	1.095	0.09426	1.20674454	0.6	99.26
cis-1,2-Dichloroethene (ug/L)	MWell#11 (bg)	61	0.4115	0.13003236	0.3606	0.04617	0.8763062	0.2	100
cis-1,3-Dichloropropene (ug/L)	MWell#1 (bg)	133	0.8595	0.86452804	0.9298	0.08062	1.08179174	0.6	100
cis-1,3-Dichloropropene (ug/L)	MWell#11 (bg)	61	0.4577	0.11390625	0.3375	0.04322	0.73738256	0.2	100
Cobalt, Dissolved (mg/L)	MWell#1 (bg)	85	0.009528	0.00015901	0.01261	0.001368	1.32346767	0.006	55.29
Cobalt, Dissolved (mg/L)	MWell#11 (bg)	21	0.000426	4.695E-09	6.852E-05	1.495E-05	0.16076959	0.0004	71.43
Cobalt, Total (mg/L)	MWell#1 (bg)	50	0.0194	0.00012679	0.01126	0.001592	0.58041237	0.0165	0
Cobalt, Total (mg/L)	MWell#11 (bg)	49	0.001245	5.1121E-06	0.002261	0.000323	1.81606426	0.00047	44.9
Conductivity (umhos/cm)	MWell#1 (bg)	121	702.9	39680.64	199.2	18.11	0.28339735	721	0
Conductivity (umhos/cm)	MWell#11 (bg)	57	1449	145694.89	381.7	50.56	0.26342305	1616	0
Copper, Dissolved (mg/L)	MWell#1 (bg)	85	0.006729	8.3613E-05	0.009144	0.0009918	1.35889434	0.002	68.24
Copper, Dissolved (mg/L)	MWell#11 (bg)	21	0.003705	1.1404E-05	0.003377	0.000737	0.91147099	0.0024	14.29
Copper, Total (mg/L)	MWell#1 (bg)	50	0.002472	2.3043E-06	0.001518	0.0002147	0.61407767	0.002	68
Copper, Total (mg/L)	MWell#11 (bg)	49	0.003054	5.0176E-06	0.00224	0.00032	0.73346431	0.002	59.18
Dibromochloromethane (ug/L)	MWell#1 (bg)	134	0.8724	1.014049	1.007	0.08702	1.15428702	0.6	100
Dibromochloromethane (ug/L)	MWell#11 (bg)	61	0.418	0.14182756	0.3766	0.04822	0.90095694	0.2	100
Dibromomethane (ug/L)	MWell#1 (bg)	131	0.9032	1.071225	1.035	0.0904	1.1459256	0.6	100
Dibromomethane (ug/L)	MWell#11 (bg)	61	0.4085	0.12645136	0.3556	0.04553	0.87050184	0.2	100
Dissolved Oxygen (mg/L)	MWell#1 (bg)	66	5.599	0.43546801	0.6599	0.08123	0.11786033	5.595	0
Dissolved Oxygen (mg/L)	MWell#11 (bg)	60	8.005	1.838736	1.356	0.1751	0.16939413	8.115	0
Ethane (ug/L)	MWell#1 (bg)	67	6.358	21.7156	4.66	0.5693	0.73293489	10	100

¹ All statistics based on Non-Detects = 1/2 MDL ² (bg) indicates a background well.

HORN RAPIDS LANDFILL - FOURTH QUARTER 2025

Summary of Descriptive Statistics

Constituent Name	Well	N	Mean ¹	Variance	Standard Deviation	Standard Error	Coefficient of Variation	Median	% Non-Detects
Ethane (ug/L)	MWell#11 (bg)	61	5.817	18.267076	4.274	0.5472	0.73474299	5	98.36
Ethene (ug/L)	MWell#1 (bg)	67	6.3	21.123216	4.596	0.5614	0.72952381	10	100
Ethene (ug/L)	MWell#11 (bg)	61	5.948	18.567481	4.309	0.5517	0.72444519	10	96.72
Ethylbenzene (ug/L)	MWell#1 (bg)	134	0.8708	1.012036	1.006	0.08687	1.15525953	0.745	100
Ethylbenzene (ug/L)	MWell#11 (bg)	61	0.4113	0.12517444	0.3538	0.0453	0.86019937	0.2	98.36
Iodomethane (ug/L)	MWell#1 (bg)	127	2.891	10.125124	3.182	0.2824	1.10065721	2	100
Iodomethane (ug/L)	MWell#11 (bg)	61	2.077	12.574116	3.546	0.454	1.7072701	0.5	100
Iron, Dissolved (mg/L)	MWell#1 (bg)	136	0.2121	0.03530641	0.1879	0.01611	0.88590288	0.175	72.06
Iron, Dissolved (mg/L)	MWell#11 (bg)	61	0.3236	0.02805625	0.1675	0.02145	0.51761434	0.28	80.33
Iron, Total (mg/L)	MWell#1 (bg)	8	0.5	0	0	0	0	0.5	100
Iron, Total (mg/L)	MWell#11 (bg)	8	0.6	0.07997584	0.2828	0.1	0.47133333	0.5	87.5
Lead, Dissolved (mg/L)	MWell#1 (bg)	84	0.00669	0.00023654	0.01538	0.001678	2.29895366	0.001	90.48
Lead, Dissolved (mg/L)	MWell#11 (bg)	21	0.0004	0	0	0	0	0.0004	100
Lead, Total (mg/L)	MWell#1 (bg)	50	0.00062	1.404E-07	0.0003747	5.299E-05	0.60454985	0.00041	92
Lead, Total (mg/L)	MWell#11 (bg)	49	0.000621	2.8079E-07	0.0005299	0.0000757	0.85357603	0.0004	93.88
m, p-Xylene (ug/L)	MWell#1 (bg)	4	0.4	0	0	0	0	0.4	100
m, p-Xylene (ug/L)	MWell#11 (bg)	4	0.785	0.5929	0.77	0.385	0.98089172	0.4	75
Magnesium, Dissolved (mg/L)	MWell#1 (bg)	124	20.24	33.466225	5.785	0.5195	0.28582016	21.85	0
Magnesium, Dissolved (mg/L)	MWell#11 (bg)	61	44.47	171.0864	13.08	1.675	0.29413087	50	0
Magnesium, Total (mg/L)	MWell#1 (bg)	8	24	16	4	1.414	0.16666667	24	0
Magnesium, Total (mg/L)	MWell#11 (bg)	8	37.5	47.997184	6.928	2.449	0.18474667	40.5	0
Manganese, Dissolved (mg/L)	MWell#1 (bg)	136	0.01605	0.00030906	0.01758	0.001508	1.0953271	0.02	81.62
Manganese, Dissolved (mg/L)	MWell#11 (bg)	61	0.02425	0.00129384	0.03597	0.004606	1.48329897	0.02	95.08
Manganese, Total (mg/L)	MWell#1 (bg)	8	0.02	0	0	0	0	0.02	100
Manganese, Total (mg/L)	MWell#11 (bg)	8	0.02137	1.5124E-05	0.003889	0.001375	0.18198409	0.02	87.5
Methane (ug/L)	MWell#1 (bg)	67	1.588	4.289041	2.071	0.253	1.30415617	1.2	91.04
Methane (ug/L)	MWell#11 (bg)	61	2.42	42.432196	6.514	0.834	2.69173554	1.2	80.33
Methylene Chloride (ug/L)	MWell#1 (bg)	135	2.566	4.498641	2.121	0.1825	0.82657833	1.6	97.78
Methylene Chloride (ug/L)	MWell#11 (bg)	61	2.862	3.606201	1.899	0.2431	0.66352201	3	100
Nickel, Dissolved (mg/L)	MWell#1 (bg)	85	0.01268	0.00045882	0.02142	0.002324	1.68927445	0.003	69.41
Nickel, Dissolved (mg/L)	MWell#11 (bg)	21	0.005452	4.9908E-06	0.002234	0.0004874	0.40975789	0.0052	14.29
Nickel, Total (mg/L)	MWell#1 (bg)	50	0.002908	1.6843E-07	0.0004104	5.804E-05	0.14112792	0.003	94
Nickel, Total (mg/L)	MWell#11 (bg)	49	0.00547	2.9279E-05	0.005411	0.000773	0.98921389	0.003	55.1
Nitrate Nitrogen (mg/L)	MWell#1 (bg)	134	5.954	13.860729	3.723	0.3217	0.62529392	6.955	0
Nitrate Nitrogen (mg/L)	MWell#11 (bg)	60	32.93	130.8736	11.44	1.477	0.34740358	35	3.333
o-Xylene (ug/L)	MWell#1 (bg)	4	0.2	0	0	0	0	0.2	100
o-Xylene (ug/L)	MWell#11 (bg)	4	0.3425	0.081225	0.285	0.1425	0.83211679	0.2	75
pH (none)	MWell#1 (bg)	125	7.24	0.07054336	0.2656	0.02376	0.03668508	7.18	0
pH (none)	MWell#11 (bg)	61	7.412	0.04835601	0.2199	0.02816	0.02966811	7.41	0
Potassium, Dissolved (mg/L)	MWell#1 (bg)	124	7.409	1.406596	1.186	0.1065	0.16007558	7.7	0
Potassium, Dissolved (mg/L)	MWell#11 (bg)	61	11.2	2.350089	1.533	0.1963	0.136875	12	0
Potassium, Total (mg/L)	MWell#1 (bg)	8	8.713	1.800964	1.342	0.4745	0.15402272	8.55	0
Potassium, Total (mg/L)	MWell#11 (bg)	8	10.56	1.7424	1.32	0.4667	0.125	11	0
Redox (mv)	MWell#1 (bg)	67	101.3	8828.4816	93.96	11.48	0.92754195	100	0
Redox (mv)	MWell#11 (bg)	61	112	10836.81	104.1	13.33	0.92946429	115.2	0
Selenium, Dissolved (mg/L)	MWell#1 (bg)	85	0.01254	0.00083059	0.02882	0.003126	2.29824561	0.002	31.76
Selenium, Dissolved (mg/L)	MWell#11 (bg)	21	0.005478	1.2895E-05	0.003591	0.0007835	0.65553122	0.0048	4.762
Selenium, Total (mg/L)	MWell#1 (bg)	50	0.005384	8.7557E-06	0.002959	0.0004185	0.54959138	0.008	70
Selenium, Total (mg/L)	MWell#11 (bg)	49	0.008068	2.9104E-06	0.001706	0.0002437	0.21145265	0.008	55.1
Silver, Dissolved (mg/L)	MWell#1 (bg)	85	0.0061	0.0001508	0.01228	0.001332	2.01311475	0.001	97.65
Silver, Dissolved (mg/L)	MWell#11 (bg)	21	0.0004	0	0	0	0	0.0004	100
Silver, Total (mg/L)	MWell#1 (bg)	50	0.000472	3.8809E-08	0.000197	2.785E-05	0.41737288	0.0004	100
Silver, Total (mg/L)	MWell#11 (bg)	49	0.000461	3.3672E-08	0.0001835	2.621E-05	0.39787511	0.0004	100
Sodium, Dissolved (mg/L)	MWell#1 (bg)	124	19.47	16.703569	4.087	0.367	0.20991269	21	0
Sodium, Dissolved (mg/L)	MWell#11 (bg)	61	19.24	6.395841	2.529	0.3238	0.13144491	20	0
Sodium, Total (mg/L)	MWell#1 (bg)	8	22.38	9.696996	3.114	1.101	0.13914209	23	0
Sodium, Total (mg/L)	MWell#11 (bg)	8	18.5	1.999396	1.414	0.5	0.07643243	19	0
Styrene (ug/L)	MWell#1 (bg)	134	1.002	0.900601	0.949	0.08198	0.94710579	1	100
Styrene (ug/L)	MWell#11 (bg)	61	0.6957	0.10549504	0.3248	0.04159	0.4668679	0.74	100

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HORN RAPIDS LANDFILL - FOURTH QUARTER 2025
Summary of Descriptive Statistics

Constituent Name	Well	N	Mean ¹	Variance	Standard Deviation	Standard Error	Coefficient of Variation	Median	% Non-Detects
Sulfate (mg/L)	MWell#1 (bg)	136	41.04	200.5056	14.16	1.214	0.34502924	46	0
Sulfate (mg/L)	MWell#11 (bg)	61	245	10712.25	103.5	13.25	0.42244898	290	0
TDS (mg/L)	MWell#1 (bg)	125	447.9	14448.04	120.2	10.75	0.26836347	460	0
TDS (mg/L)	MWell#11 (bg)	61	1089	130682.25	361.5	46.29	0.33195592	1200	0
Temperature (C)	MWell#1 (bg)	136	20.32	5.248681	2.291	0.1965	0.11274606	20.47	0
Temperature (C)	MWell#11 (bg)	61	20.86	4.330561	2.081	0.2665	0.09976031	21.2	0
Tetrachloroethene (ug/L)	MWell#1 (bg)	134	3.32	2.896804	1.702	0.147	0.5126506	3.85	17.16
Tetrachloroethene (ug/L)	MWell#11 (bg)	61	0.5885	0.09703225	0.3115	0.03988	0.52931181	0.5	100
Thallium, Dissolved (mg/L)	MWell#1 (bg)	85	0.006758	0.00021815	0.01477	0.001602	2.18555786	0.001	98.82
Thallium, Dissolved (mg/L)	MWell#11 (bg)	21	0.000962	6.4754E-09	8.047E-05	1.756E-05	0.08365734	0.001	100
Thallium, Total (mg/L)	MWell#1 (bg)	50	0.000976	1.4113E-08	0.0001188	0.0000168	0.12172131	0.001	100
Thallium, Total (mg/L)	MWell#11 (bg)	49	0.000976	1.4376E-08	0.0001199	1.714E-05	0.12291133	0.001	100
TOC (mg/L)	MWell#1 (bg)	135	1.837	5.851561	2.419	0.2082	1.3168209	1.4	27.41
TOC (mg/L)	MWell#11 (bg)	61	4.019	7.745089	2.783	0.3563	0.69246081	3.7	3.279
Toluene (ug/L)	MWell#1 (bg)	135	0.8725	1.030225	1.015	0.08733	1.16332378	0.6	99.26
Toluene (ug/L)	MWell#11 (bg)	61	0.4513	0.21846276	0.4674	0.05984	1.03567472	0.2	96.72
Total Suspended Solids (mg/L)	MWell#1 (bg)	45	2.107	1.9881	1.41	0.2102	0.66919791	2	97.78
Total Suspended Solids (mg/L)	MWell#11 (bg)	44	5.614	305.9001	17.49	2.636	3.11542572	2	72.73
trans-1,2-Dichloroethene (ug/L)	MWell#1 (bg)	134	0.8739	1.012036	1.006	0.08693	1.15116146	0.8	100
trans-1,2-Dichloroethene (ug/L)	MWell#11 (bg)	61	0.4148	0.13527684	0.3678	0.04709	0.88669238	0.2	100
trans-1,3-Dichloropropene (ug/L)	MWell#1 (bg)	133	0.8342	0.88962624	0.9432	0.08178	1.13066411	0.55	100
trans-1,3-Dichloropropene (ug/L)	MWell#11 (bg)	61	0.4025	0.12236004	0.3498	0.04479	0.86906832	0.2	100
trans-1,4-Dichloro-2-butene (ug/L)	MWell#1 (bg)	124	2.746	4.268356	2.066	0.1856	0.75236708	2	100
trans-1,4-Dichloro-2-butene (ug/L)	MWell#11 (bg)	61	2.8	3.400336	1.844	0.2361	0.65857143	2	100
Trichloroethene (ug/L)	MWell#1 (bg)	135	0.8913	0.97515625	0.9875	0.08499	1.10793223	0.53	71.85
Trichloroethene (ug/L)	MWell#11 (bg)	61	0.4131	0.132496	0.364	0.0466	0.88114258	0.2	100
Trichlorofluoromethane (ug/L)	MWell#1 (bg)	135	1.138	3.330625	1.825	0.1571	1.60369069	0.6	97.04
Trichlorofluoromethane (ug/L)	MWell#11 (bg)	61	0.5902	0.10093329	0.3177	0.04067	0.5382921	0.5	100
Turbidity (NTU)	MWell#1 (bg)	5	0.452	0.19140625	0.4375	0.1956	0.96792035	0.62	0
Turbidity (NTU)	MWell#11 (bg)	3	6.913	20.403289	4.517	2.608	0.65340663	6.05	0
Vanadium, Dissolved (mg/L)	MWell#1 (bg)	85	0.0137	0.00019238	0.01387	0.001504	1.01240876	0.0107	16.47
Vanadium, Dissolved (mg/L)	MWell#11 (bg)	21	0.0098	2.4118E-06	0.001553	0.000339	0.15846939	0.0098	0
Vanadium, Total (mg/L)	MWell#1 (bg)	50	0.009125	1.063E-06	0.001031	0.0001457	0.1129863	0.0092	0
Vanadium, Total (mg/L)	MWell#11 (bg)	49	0.01014	3.7365E-06	0.001933	0.0002761	0.19063116	0.01	0
Vinyl Acetate (ug/L)	MWell#1 (bg)	129	4.033	30.239001	5.499	0.4842	1.36350112	2	100
Vinyl Acetate (ug/L)	MWell#11 (bg)	61	2.228	3.147076	1.774	0.2271	0.7962298	2	100
Vinyl Chloride (ug/L)	MWell#1 (bg)	134	1.043	4.044121	2.011	0.1737	1.92809204	0.55	100
Vinyl Chloride (ug/L)	MWell#11 (bg)	61	0.307	0.17372224	0.4168	0.05337	1.35765472	0.02	100
Xylenes (ug/L)	MWell#1 (bg)	89	1.341	0.81685444	0.9038	0.0958	0.67397465	1	100
Xylenes (ug/L)	MWell#11 (bg)	55	0.9776	0.70476025	0.8395	0.1132	0.85873568	0.5	100
Zinc, Dissolved (mg/L)	MWell#1 (bg)	96	0.009889	0.00010221	0.01011	0.001032	1.02234806	0.00545	53.13
Zinc, Dissolved (mg/L)	MWell#11 (bg)	21	0.006676	3.9238E-05	0.006264	0.001367	0.9382864	0.0041	28.57
Zinc, Total (mg/L)	MWell#1 (bg)	54	0.01389	0.00016053	0.01267	0.001724	0.91216703	0.007	70.37
Zinc, Total (mg/L)	MWell#11 (bg)	49	0.01036	0.00012522	0.01119	0.001599	1.08011583	0.007	83.67

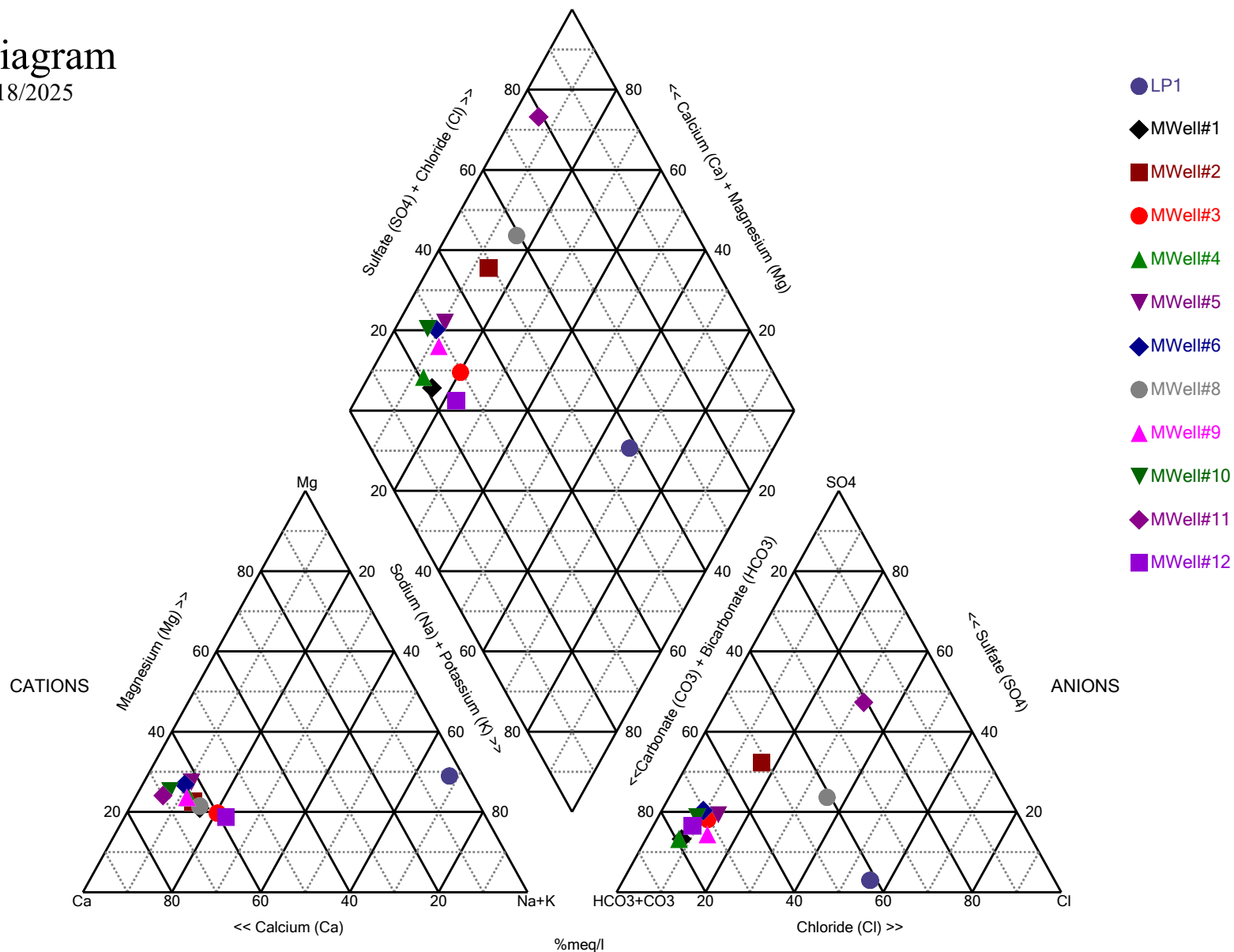
¹ All statistics based on Non-Detects = 1/2 MDL ² (bg) indicates a background well.

Appendix F

Geochemical Evaluation

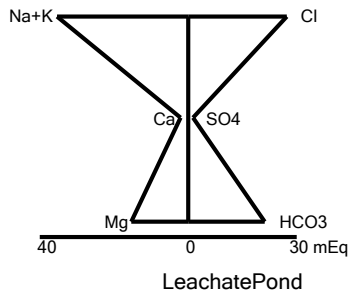
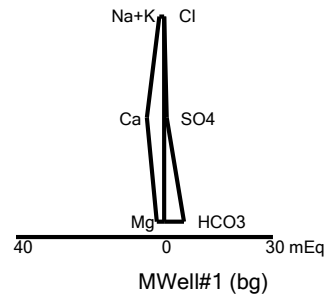
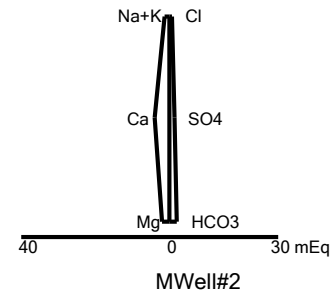
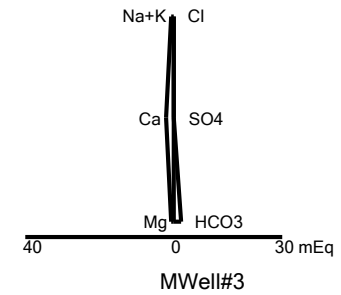
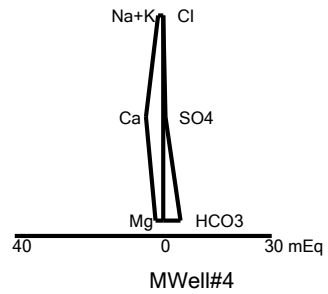
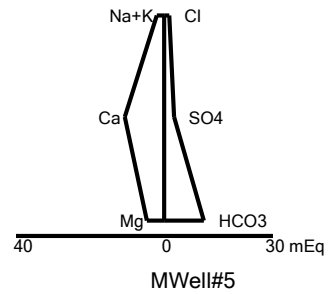
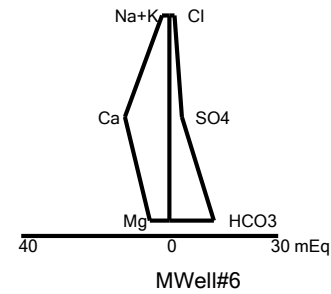
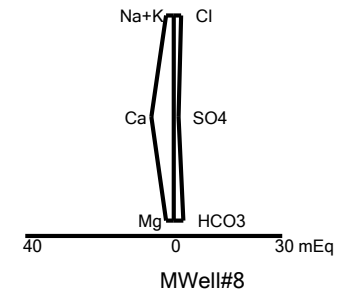
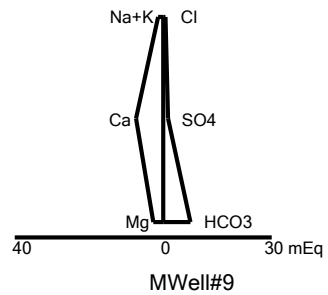
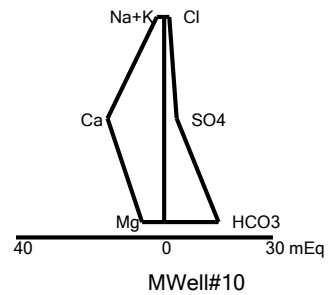
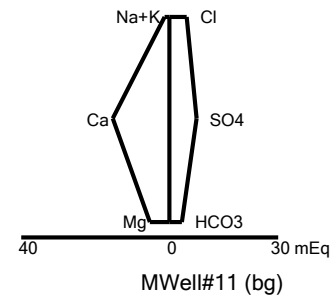
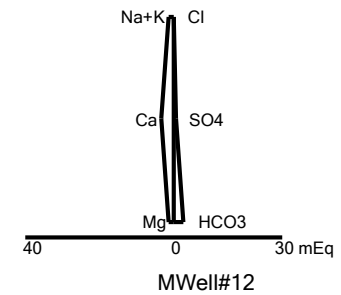
Piper Diagram

3/19/2025, 3/18/2025



Analysis Run 2/25/2026 1:21 PM

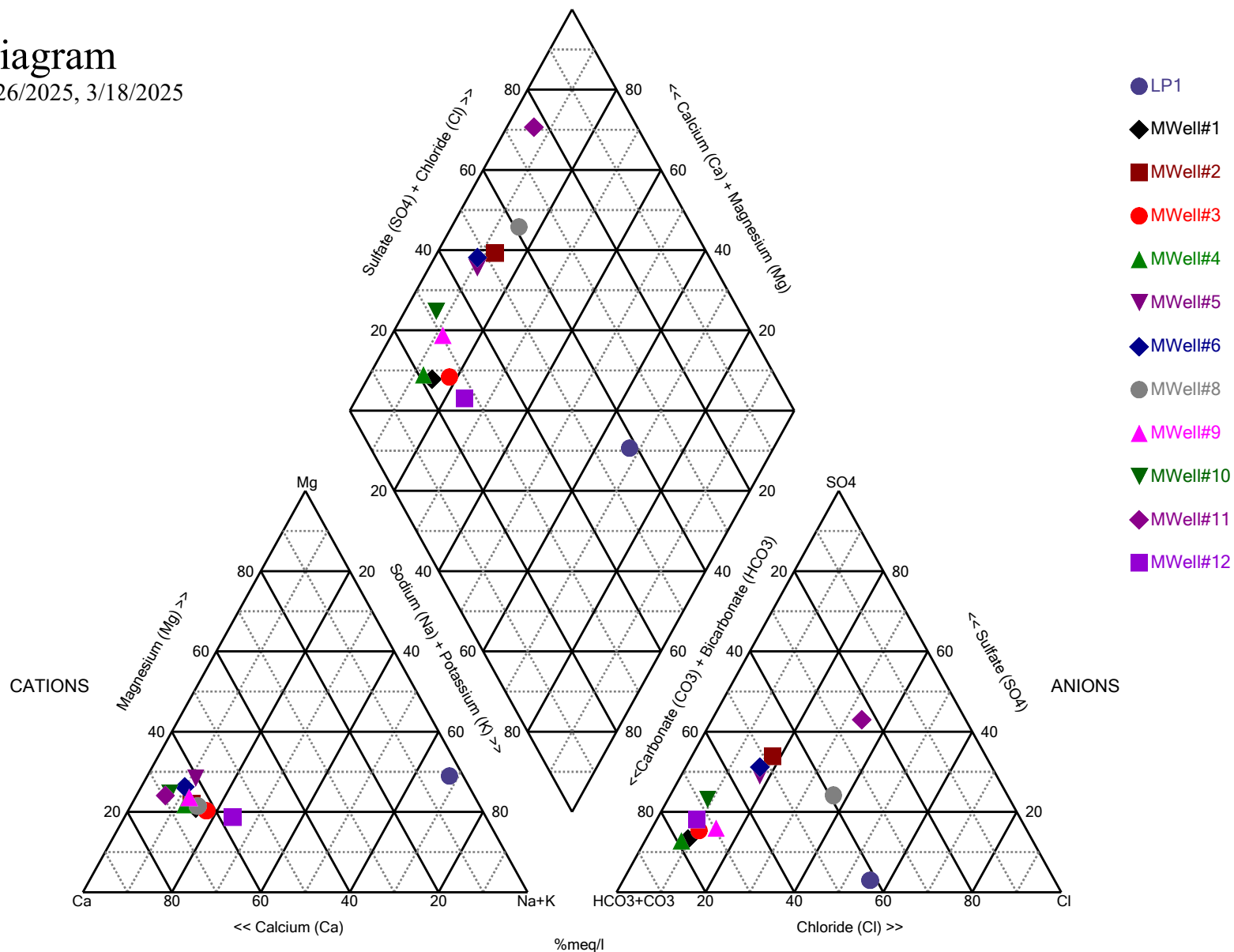
Horn Rapids Landfill Client: City of Richland Data: 1Q_25_PIPER_finalv2



Stiff Diagram - 3/18/2025, 3/19/2025 Analysis Run 5/16/2025 3:22 PM
Horn Rapids Landfill Client: City of Richland Data: 1Q_25_PIPER_final

Piper Diagram

6/25/2025, 6/26/2025, 3/18/2025

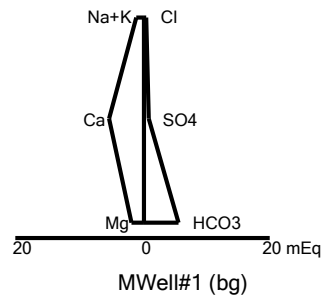
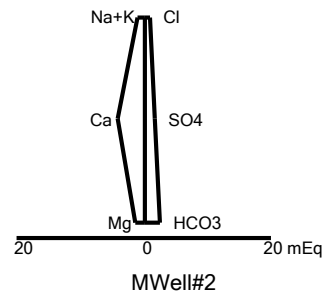
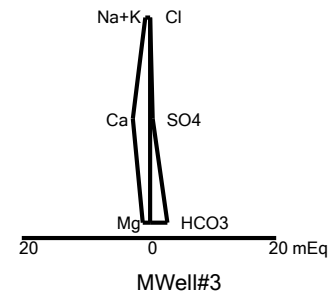
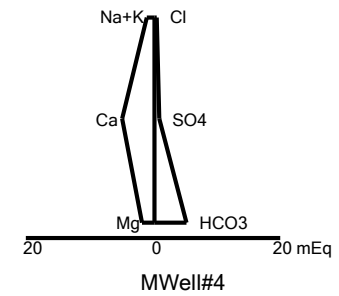
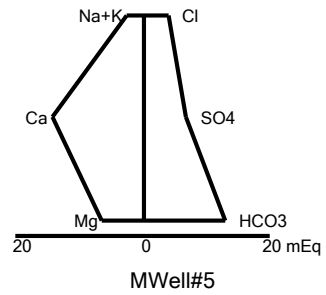
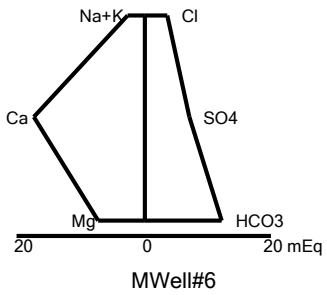
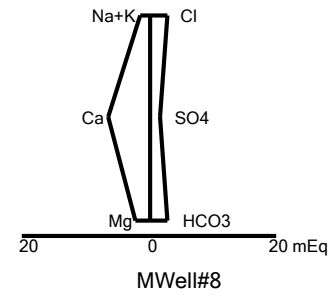
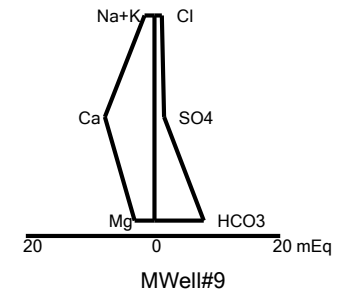
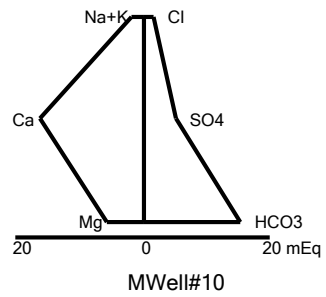
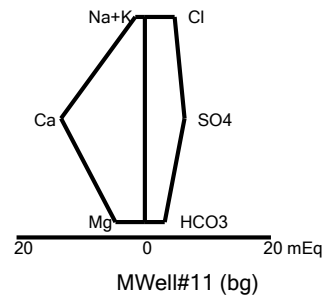
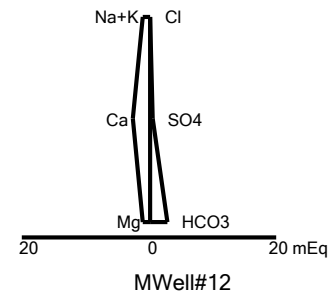


Analysis Run 2/25/2026 1:25 PM

Horn Rapids Landfill

Client: City of Richland

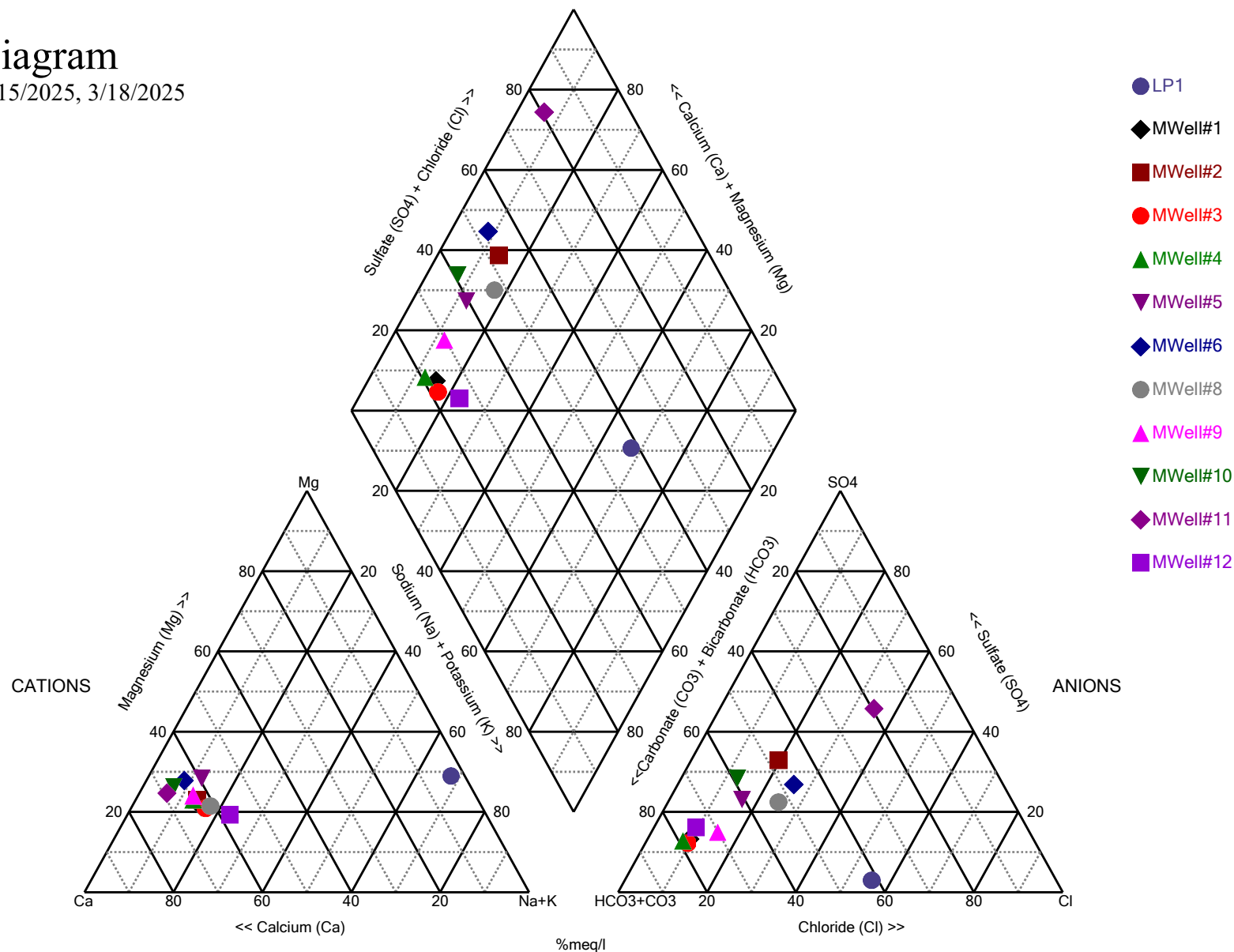
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Stiff Diagram - 6/25/2025, 6/26/2025 Analysis Run 8/7/2025 3:05 PM
Horn Rapids Landfill Client: City of Richland Data: 2Q_25_PIPER_final

Piper Diagram

9/16/2025, 9/15/2025, 3/18/2025

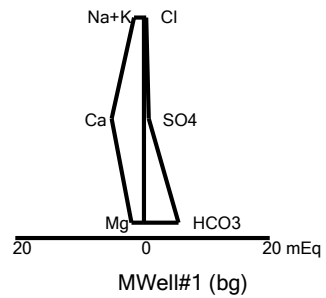
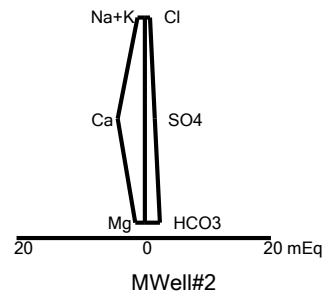
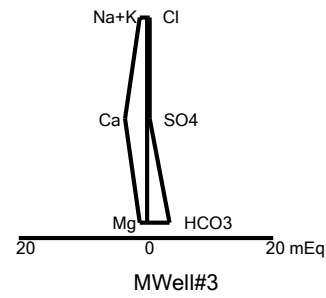
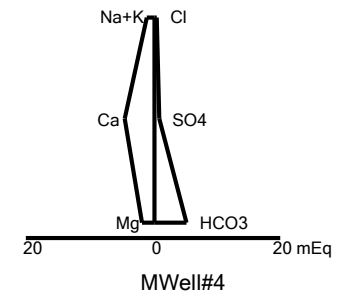
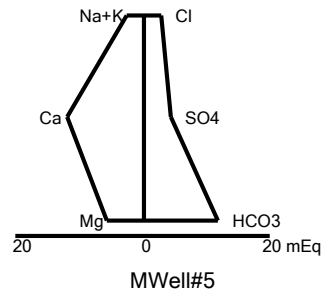
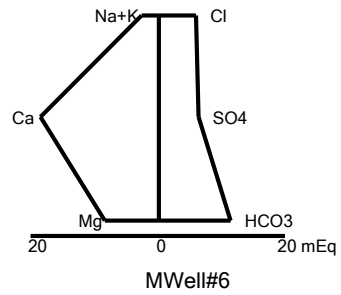
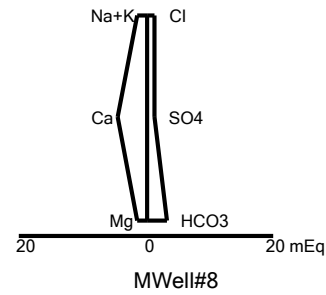
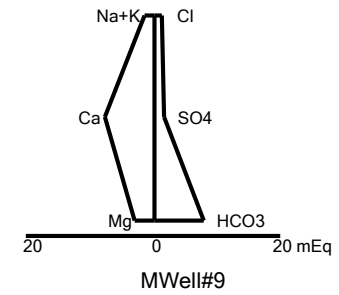
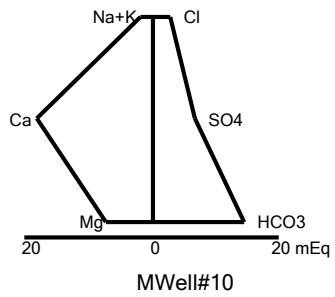
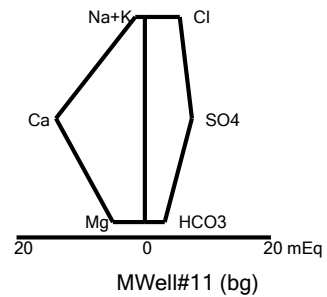
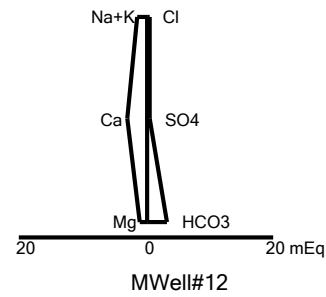


Analysis Run 2/25/2026 1:30 PM

Horn Rapids Landfill

Client: City of Richland

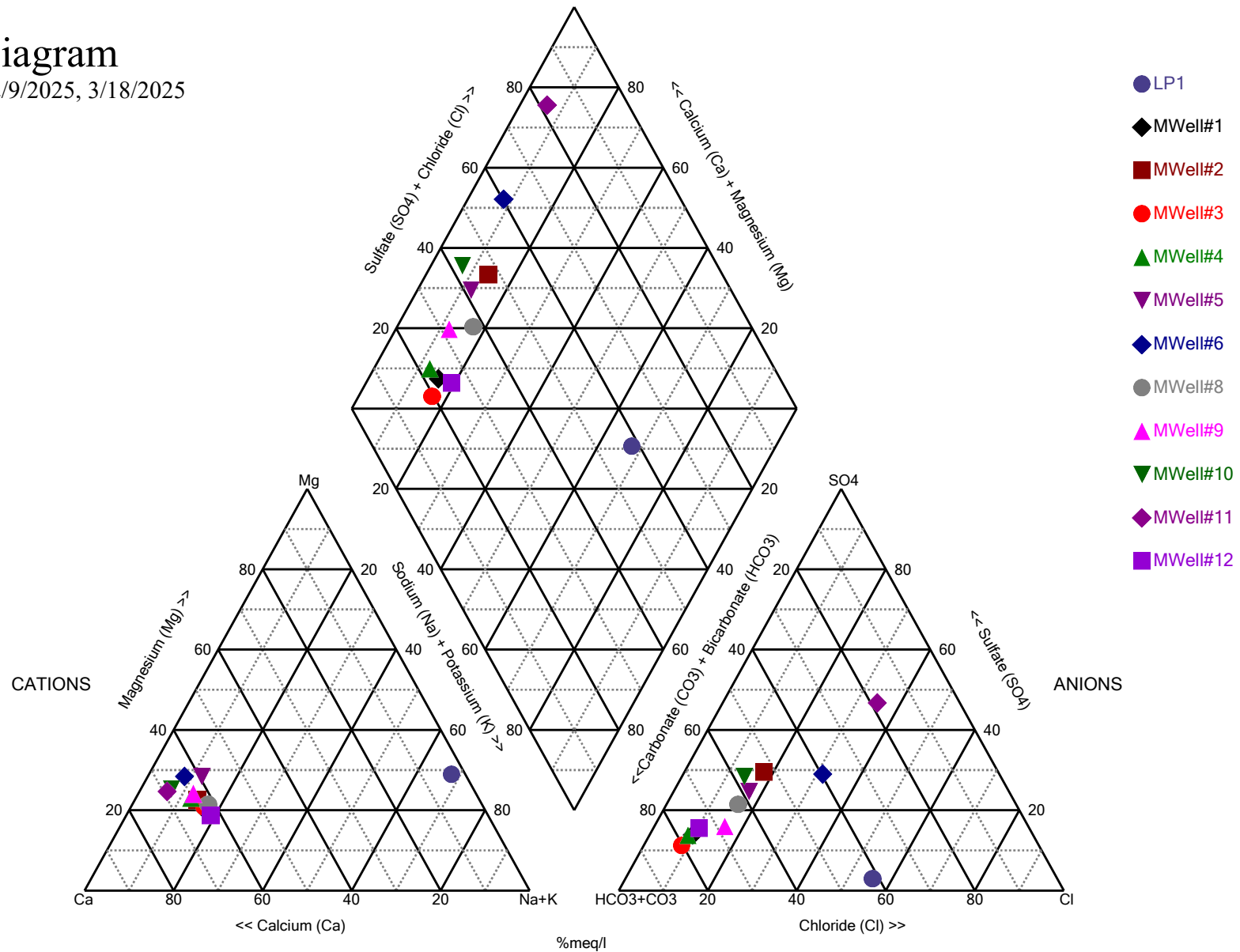
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Stiff Diagram - 9/16/2025, 9/15/2025 Analysis Run 11/19/2025 10:47 AM
 Horn Rapids Landfill Client: City of Richland Data: 3Q_25_PIPER_final

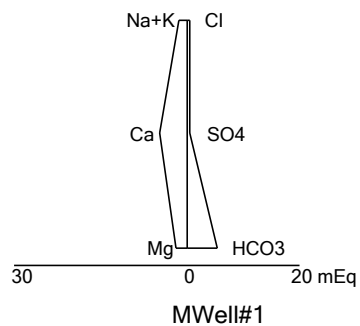
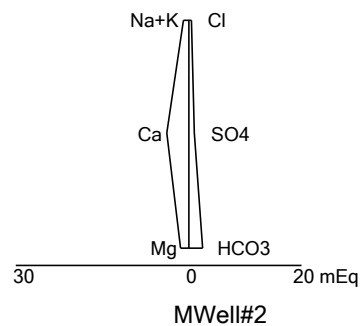
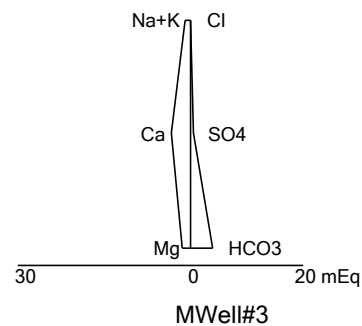
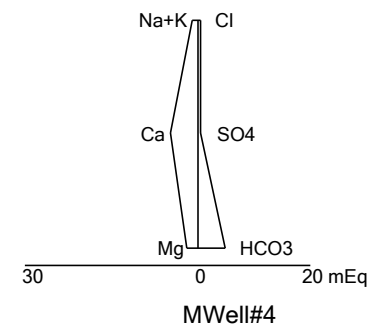
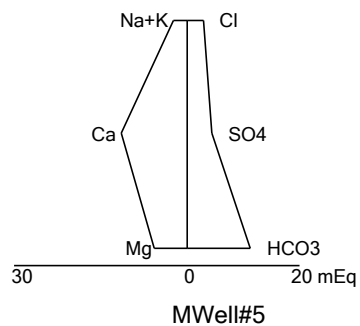
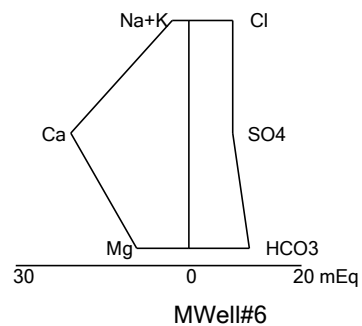
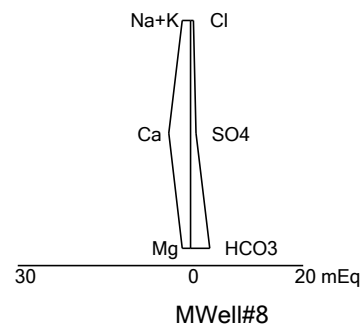
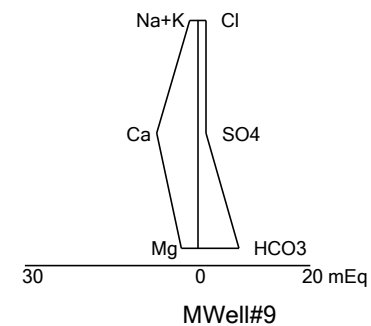
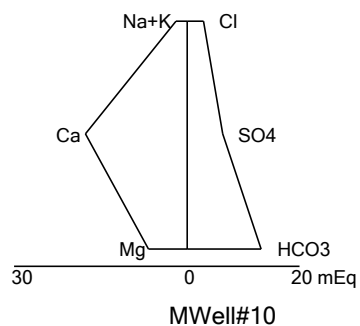
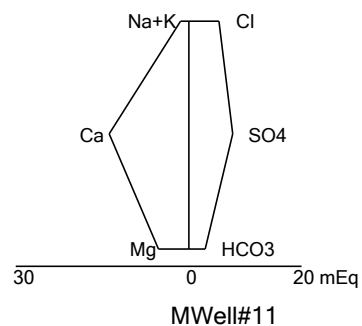
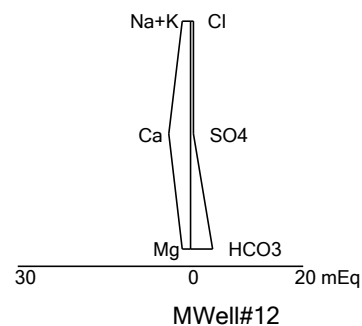
Piper Diagram

12/8/2025, 12/9/2025, 3/18/2025



Analysis Run 2/13/2026 3:37 PM

Horn Rapids Landfill Client: City of Richland Data: 4Q_25_PIPER_final



Stiff Diagram - 12/8/2025, 12/9/2025 Analysis Run 2/13/2026 3:38 PM
Horn Rapids Landfill Client: City of Richland Data: 4Q_25_PIPER_final

Summary of Cation/Anion Charge Balance Differences,
 2025 Groundwater Data, Horn Rapids Landfill

Monitoring Well	First Quarter RPD ¹	Second Quarter RPD ¹	Third Quarter RPD ¹	Fourth Quarter RPD ¹
Well #1	-1.82	0.98	-0.22	-0.47
Well #2	-0.46	1.98	0.74	-1.24
Well #3	-3.08	1.54	1.76	-0.89
Well #4	-3.78	1.13	-1.06	0.12
Well #5	-0.24	-3.44	1.74	-1.20
Well #6	-1.43	1.12	0.68	-1.11
Well #8	-0.63	2.40	-0.30	-0.92
Well #9	-0.62	-0.83	0.82	-0.27
Well #10	-0.04	0.53	1.27	0.39
Well #11	5.15	1.74	0.14	-2.38
Well #12	-0.24	0.17	0.45	-0.09
Leachate Pond	2.39	NA	NA	NA

Note:

¹ Reported in relative percent difference (RPD). For each sample the analytical results were converted into milliequivalents per liter (meq/L) and the cation meq/L summed (C) and the anion meq/L summed (A).

$$RPD = \frac{2(C-A)}{C+A} \times 100$$

☐ = Outside WAC 173-351-420(5)(a) acceptable range

NA= Not available

Cation/Anion Balance Calculations (Dissolved Metals), Horn Rapids Landfill, First Quarter 2025

Conversion Factor ¹ (mg/L to meq/L)		MW-1			MW-2			MW-3			MW-4			MW-5			MW-6		
		Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)
CATIONS																			
Na	0.0435	21.7	0.94	13.15	14.7	0.64	10.64	11.3	0.49	15.83	14.9	0.65	9.52	31.7	1.38	8.34	31.0	1.35	7.32
Ca	0.0499	91.4	4.56	63.53	77.0	3.84	63.95	37.2	1.86	59.78	87.9	4.39	64.44	205	10.23	61.90	236	11.78	63.95
Mg	0.08229	18.0	1.48	20.63	16.5	1.36	22.60	7.52	0.62	19.93	19.3	1.59	23.33	54.9	4.52	27.34	59.6	4.90	26.63
Fe(+2)	0.03581	0.05	0.00	0.02	0.05	0.00	0.03	0.05	0.00	0.06	0.05	0.00	0.03	0.05	0.00	0.01	0.05	0.00	0.01
K	0.02558	7.46	0.19	2.66	6.54	0.17	2.78	5.35	0.14	4.41	7.12	0.18	2.68	13.0	0.33	2.01	14.2	0.36	1.97
Mn	0.0364	0.002	0.00	0.00	0.002	0.00	0.00	0.002	0.00	0.00	0.002	0.00	0.00	1.82	0.07	0.40	0.589	0.02	0.12
		TOTAL	7.18	100.00	TOTAL	6.01	100.00	TOTAL	3.11	100.00	TOTAL	6.81	100.00	TOTAL	16.53	100.00	TOTAL	18.42	100.00
ANIONS																			
HCO ₃ ²	0.02	280	5.60	75.22	124	2.48	40.90	112	2.24	67.82	264	5.28	71.93	566	11.32	68.17	634	12.68	66.92
SO ₄	0.02082	44.2	0.92	12.36	74.1	1.54	25.44	27.5	0.57	17.34	41.2	0.86	11.69	151	3.14	18.93	171	3.56	18.79
Cl	0.02821	18.1	0.51	6.86	26.8	0.76	12.47	11.3	0.32	9.65	14.8	0.42	5.69	71.4	2.01	12.13	53.0	1.50	7.89
CO ₃ ²	0.02	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
NO ₃	0.0714	5.8	0.41	5.56	18	1.29	21.19	2.4	0.17	5.19	11	0.79	10.70	1.8	0.13	0.77	17	1.21	6.41
		TOTAL	7.44	100.00	TOTAL	6.06	100.00	TOTAL	3.30	100.00	TOTAL	7.34	100.00	TOTAL	16.61	100.00	TOTAL	18.95	100.00
anion + cation Sum (meq/L)		14.62			12.07			6.41			14.15			33.13			37.37		
(meq/L cations-anions)/(meq/L cations+anions)*100		-1.82			-0.46			-3.08			-3.78			-0.24			-1.43		

Cation/Anion Balance Calculations (Dissolved Metals), Horn Rapids Landfill, First Quarter 2025

Conversion Factor ¹ (mg/L to meq/L)		MW-8			MW-9			MW-10			MW-11			MW-12			Leachate Pond		
		Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)
CATIONS																			
Na	0.0435	27.3	1.19	13.09	24.1	1.05	9.57	28.2	1.23	5.52	21.4	0.93	4.39	20.3	0.88	18.83	648	28.19	53.66
Ca	0.0499	114	5.69	62.71	142	7.09	64.65	302	15.07	67.81	298	14.87	70.11	54.9	2.74	58.41	35.8	1.79	3.40
Mg	0.08229	23.7	1.95	21.50	31.4	2.58	23.58	67.2	5.53	24.88	61.7	5.08	23.94	10.6	0.87	18.60	184	15.14	28.82
Fe(+2)	0.03581	0.05	0.00	0.02	0.05	0.00	0.02	0.157	0.01	0.03	0.05	0.00	0.01	0.05	0.00	0.04	0.576	0.02	0.04
K	0.02558	9.51	0.24	2.68	9.39	0.24	2.19	15.1	0.39	1.74	12.9	0.33	1.56	7.55	0.19	4.12	289	7.39	14.07
Mn	0.0364	0.002	0.00	0.00	0.002	0.00	0.00	0.178	0.01	0.03	0.0063	0.00	0.00	0.002	0.00	0.00	0.103	0.00	0.01
		TOTAL	9.07	100.00	TOTAL	10.96	100.00	TOTAL	22.22	100.00	TOTAL	21.21	100.00	TOTAL	4.69	100.00	TOTAL	52.53	100.00
ANIONS																			
HCO ₃ ²	0.02	153	3.06	33.31	384	7.68	69.21	750	15.00	67.43	170	3.40	17.77	161	3.22	68.33	1070	21.40	42.73
SO ₄	0.02082	83.4	1.74	18.90	73.0	1.52	13.70	185	3.85	17.32	358	7.45	38.96	33.8	0.70	14.93	67.8	1.41	2.82
Cl	0.02821	89.8	2.53	27.58	45.5	1.28	11.57	57.0	1.61	7.23	172	4.85	25.36	11.5	0.32	6.88	964	27.19	54.30
CO ₃ ²	0.02	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
NO ₃	0.0714	26	1.86	20.21	8.6	0.61	5.53	25	1.79	8.02	48	3.43	17.91	6.5	0.46	9.85	1.1	0.08	0.16
		TOTAL	9.19	100.00	TOTAL	11.10	100.00	TOTAL	22.24	100.00	TOTAL	19.13	100.00	TOTAL	4.71	100.00	TOTAL	50.08	100.00
anion + cation Sum (meq/L)		18.26			22.06			44.47			40.34			9.40			102.62		
(meq/L cations-anions)/(meq/L cations+anions)*100		-0.63			-0.62			-0.04			5.15			-0.24			2.39		

¹Reference: Hem 1985.
²HCO₃ and CO₃ reported as CaCO₃, conversion factor adjusted accordingly.
 = Outside WAC 173-351-420(5)(a) acceptable range

Note: Values for cations in groundwater samples are measured as dissolved (field-filtered).
5 percent if anion plus cation sum greater than 5 meq/L; 10 percent if anion plus cation sum less than 5 meq/L

Cation/Anion Balance Calculations (Dissolved Metals), Horn Rapids Landfill, Second Quarter 2025

Conversion Factor ¹ (mg/L to meq/L)		MW-1			MW-2			MW-3			MW-4			MW-5			MW-6		
		Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)
CATIONS																			
Na	0.0435	22.2	0.97	12.35	15.6	0.68	10.57	12.9	0.56	14.10	15.7	0.68	9.48	25	1.09	4.92	50.2	2.18	8.11
Ca	0.0499	101	5.04	64.47	83.4	4.16	64.84	49.4	2.47	61.92	95.0	4.74	65.79	281	14.02	63.40	345	17.22	63.96
Mg	0.08229	19.7	1.62	20.74	17.1	1.41	21.92	9.75	0.80	20.15	19.4	1.60	22.16	78.9	6.49	29.36	85.8	7.06	26.23
Fe(+2)	0.03581	0.05	0.00	0.02	0.05	0.00	0.03	0.05	0.00	0.04	0.05	0.00	0.02	0.121	0.00	0.02	0.05	0.00	0.01
K	0.02558	7.38	0.19	2.41	6.60	0.17	2.63	5.89	0.15	3.78	7.19	0.18	2.55	14.8	0.38	1.71	17.0	0.43	1.62
Mn	0.0364	0.002	0.00	0.00	0.002	0.00	0.00	0.002	0.00	0.00	0.002	0.00	0.00	3.62	0.13	0.60	0.567	0.02	0.08
		TOTAL	7.82	100.00	TOTAL	6.42	100.00	TOTAL	3.98	100.00	TOTAL	7.21	100.00	TOTAL	22.12	100.00	TOTAL	26.92	100.00
ANIONS																			
HCO ₃ ²	0.02	282	5.64	73.57	119	2.38	38.58	137	2.74	70.97	251	5.02	71.25	641	12.82	54.11	606	12.12	46.04
SO ₄	0.02082	44.9	0.93	12.19	79.9	1.66	26.96	27.6	0.57	14.88	37.8	0.79	11.17	330	6.87	29.00	339	7.06	26.81
Cl	0.02821	21.8	0.61	8.02	30.3	0.85	13.86	12.9	0.36	9.43	15.8	0.45	6.33	139	3.92	16.55	130	3.67	13.93
CO ₃ ²	0.02	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
NO ₃	0.0714	6.67	0.48	6.21	17.8	1.27	20.60	2.55	0.18	4.72	11.1	0.79	11.25	1.15	0.08	0.35	48.7	3.48	13.21
		TOTAL	7.67	100.00	TOTAL	6.17	100.00	TOTAL	3.86	100.00	TOTAL	7.05	100.00	TOTAL	23.69	100.00	TOTAL	26.32	100.00
anion + cation Sum (meq/L)		15.48			12.59			7.84			14.25			45.81			53.24		
(meq/L cations- anions)/(meq/L cations+anions)*100		0.98			1.98			1.54			1.13			-3.44			1.12		

Cation/Anion Balance Calculations (Dissolved Metals), Horn Rapids Landfill, Second Quarter 2025

Conversion Factor ¹ (mg/L to meq/L)		MW-8			MW-9			MW-10			MW-11			MW-12		
		Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)
CATIONS																
Na	0.0435	29.2	1.27	12.87	26.0	1.13	9.80	29.7	1.29	5.49	20.6	0.90	4.85	20.4	0.89	20.27
Ca	0.0499	125	6.24	63.20	149	7.44	64.42	322	16.07	68.33	258	12.87	69.67	49.9	2.49	56.88
Mg	0.08229	25.7	2.11	21.43	33.3	2.74	23.74	70.0	5.76	24.50	53.6	4.41	23.87	9.93	0.82	18.66
Fe(+2)	0.03581	0.05	0.00	0.02	0.05	0.00	0.02	0.232	0.01	0.04	0.05	0.00	0.01	0.05	0.00	0.04
K	0.02558	9.60	0.25	2.49	9.14	0.23	2.03	14.7	0.38	1.60	11.6	0.30	1.61	7.10	0.18	4.15
Mn	0.0364	0.002	0.00	0.00	0.002	0.00	0.00	0.279	0.01	0.04	0.002	0.00	0.00	0.002	0.00	0.00
		TOTAL	9.87	100.00	TOTAL	11.54	100.00	TOTAL	23.51	100.00	TOTAL	18.48	100.00	TOTAL	4.38	100.00
ANIONS																
HCO ₃ ²	0.02	152	3.04	32.32	391	7.82	66.63	762	15.24	65.50	172	3.44	19.27	144	2.88	66.00
SO ₄	0.02082	87.4	1.82	19.34	85.8	1.79	15.22	245	5.10	21.92	297	6.18	34.65	34.4	0.72	16.41
Cl	0.02821	96.4	2.72	28.91	52.0	1.47	12.50	60.9	1.72	7.38	167	4.71	26.40	11.3	0.32	7.31
CO ₃ ²	0.02	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
NO ₃	0.0714	25.6	1.83	19.43	9.28	0.66	5.65	16.9	1.21	5.19	49.2	3.51	19.68	6.28	0.45	10.28
		TOTAL	9.41	100.00	TOTAL	11.74	100.00	TOTAL	23.27	100.00	TOTAL	17.85	100.00	TOTAL	4.36	100.00
anion + cation Sum (meq/L)		19.28			23.28			46.78			36.33			8.74		
(meq/L cations- anions)/(meq/L cations+anions)*100		2.40			-0.83			0.53			1.74			0.17		

¹Reference: Hem 1985.

²HCO₃ and CO₃ reported as CaCO₃, conversion factor adjusted accordingly.

 = Outside WAC 173-351-420(5)(a) acceptable range

Note: Values for cations in groundwater samples are measured as dissolved (field-filtered).

5 percent if anion plus cation sum greater than 5 meq/L; 10 percent if anion plus cation sum less than 5 meq/L

Cation/Anion Balance Calculations (Dissolved Metals), Horn Rapids Landfill, Third Quarter 2025

Conversion Factor ¹ (mg/L to meq/L)		MW-1			MW-2			MW-3			MW-4			MW-5			MW-6		
				Percent of Total (meq/L)			Percent of Total (meq/L)			Percent of Total (meq/L)			Percent of Total (meq/L)			Percent of Total (meq/L)			
		Value (mg/L)	Value (meq/L)		Value (mg/L)	Value (meq/L)		Value (mg/L)	Value (meq/L)		Value (mg/L)	Value (meq/L)		Value (mg/L)	Value (meq/L)		Value (mg/L)	Value (meq/L)	
CATIONS																			
Na	0.0435	22.9	1.00	13.05	15.8	0.69	10.97	15.5	0.67	13.40	16.0	0.70	9.95	47.1	2.05	10.25	44.6	1.94	6.68
Ca	0.0499	96.6	4.82	63.15	79.3	3.96	63.16	62.9	3.14	62.39	90.0	4.49	64.21	237	11.83	59.19	370	18.46	63.61
Mg	0.08229	19.7	1.62	21.24	17.6	1.45	23.12	12.6	1.04	20.61	19.7	1.62	23.18	68.4	5.63	28.17	99.0	8.15	28.07
Fe(+2)	0.03581	0.05	0.00	0.02	0.05	0.00	0.03	0.05	0.00	0.04	0.05	0.00	0.03	0.05	0.00	0.01	0.05	0.00	0.01
K	0.02558	7.56	0.19	2.53	6.66	0.17	2.72	6.99	0.18	3.55	7.22	0.18	2.64	14.3	0.37	1.83	17.6	0.45	1.55
Mn	0.0364	0.002	0.00	0.00	0.002	0.00	0.00	0.002	0.00	0.00	0.002	0.00	0.00	3.00	0.109	0.55	0.633	0.02	0.08
		TOTAL	7.63	100.00	TOTAL	6.26	100.00	TOTAL	5.03	100.00	TOTAL	6.99	100.00	TOTAL	19.98	100.00	TOTAL	29.02	100.00
ANIONS																			
HCO ₃ ²	0.02	281	5.62	73.30	120	2.40	38.88	186	3.72	76.61	253	5.06	70.83	591	11.82	61.25	568	11.36	39.68
SO ₄	0.02082	44.8	0.93	12.17	77.5	1.61	26.14	27.6	0.57	11.83	37.9	0.79	11.05	213	4.43	22.98	305	6.35	22.18
Cl	0.02821	22.0	0.62	8.09	33.5	0.95	15.31	13.8	0.39	8.02	16.8	0.47	6.63	104	2.93	15.20	212	5.98	20.89
CO ₃ ²	0.02	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
NO ₃	0.0714	6.91	0.49	6.44	17	1.21	19.67	2.41	0.17	3.54	11.5	0.82	11.49	1.53	0.11	0.57	69.2	4.94	17.26
		TOTAL	7.67	100.00	TOTAL	6.17	100.00	TOTAL	4.86	100.00	TOTAL	7.14	100.00	TOTAL	19.30	100.00	TOTAL	28.63	100.00
anion + cation Sum (meq/L)		15.30			12.44			9.89			14.14			39.28			57.66		
(meq/L cations- anions)/(meq/L cations+anions)*100		-0.22			0.74			1.76			-1.06			1.74			0.68		

Cation/Anion Balance Calculations (Dissolved Metals), Horn Rapids Landfill, Third Quarter 2025

Conversion Factor ¹ (mg/L to meq/L)		MW-8			MW-9			MW-10			MW-11			MW-12		
		Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)
CATIONS																
Na	0.0435	23.3	1.01	14.31	27.4	1.19	10.19	31.9	1.39	5.18	21.9	0.95	4.75	22.2	0.97	19.13
Ca	0.0499	86.8	4.33	61.14	149	7.44	63.54	359	17.91	66.87	277	13.82	68.89	58.5	2.92	57.82
Mg	0.08229	18.6	1.53	21.61	34.3	2.82	24.12	85.6	7.04	26.30	60.4	4.97	24.77	11.7	0.96	19.07
Fe(+2)	0.03581	0.05	0.00	0.03	0.05	0.00	0.02	0.420	0.02	0.06	0.05	0.00	0.01	0.05	0.00	0.04
K	0.02558	8.07	0.21	2.91	9.75	0.25	2.13	16.0	0.41	1.53	12.4	0.32	1.58	7.80	0.20	3.95
Mn	0.0364	0.002	0.00	0.00	0.002	0.00	0.00	0.489	0.02	0.07	0.002	0.00	0.00	0.002	0.00	0.00
		TOTAL	7.08	100.00	TOTAL	11.70	100.00	TOTAL	26.79	100.00	TOTAL	20.06	100.00	TOTAL	5.05	100.00
ANIONS																
HCO ₃ ²	0.02	161	3.22	45.18	386	7.72	67.07	714	14.28	54.68	163	3.26	16.29	171	3.42	68.34
SO ₄	0.02082	63.8	1.33	18.64	78.9	1.64	14.27	320	6.66	25.51	355	7.39	36.94	35.1	0.73	14.60
Cl	0.02821	50.9	1.44	20.15	53.6	1.51	13.14	98.6	2.78	10.65	196	5.53	27.64	14.1	0.40	7.95
CO ₃ ²	0.02	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
NO ₃	0.0714	16	1.14	16.03	8.91	0.64	5.53	33.5	2.39	9.16	53.6	3.83	19.13	6.38	0.46	9.10
		TOTAL	7.13	100.00	TOTAL	11.51	100.00	TOTAL	26.12	100.00	TOTAL	20.01	100.00	TOTAL	5.00	100.00
anion + cation Sum (meq/L)		14.21			23.21			52.90			40.07			10.05		
(meq/L cations- anions)/(meq/L cations+anions)*100		-0.30			0.82			1.27			0.14			0.45		

¹Reference: Hem 1985.

²HCO₃ and CO₃ reported as CaCO₃, conversion factor adjusted accordingly.

Note: Values for cations in groundwater samples are measured as dissolved (field-filtered).

5 percent if anion plus cation sum greater than 5 meq/L; 10 percent if anion plus cation sum less than 5 meq/L

Cation/Anion Balance Calculations (Dissolved Metals), Horn Rapids Landfill, Fourth Quarter 2025

Conversion Factor ¹ (mg/L to meq/L)		MW-1			MW-2			MW-3			MW-4			MW-5			MW-6		
		Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)
CATIONS																			
Na	0.0435	22.3	0.97	13.35	14.0	0.61	11.06	15.2	0.66	12.90	15.7	0.68	9.73	43.7	1.90	10.01	48.9	2.13	6.67
Ca	0.0499	91.6	4.57	62.89	70.1	3.50	63.55	64.4	3.21	62.70	90.6	4.52	64.38	226	11.28	59.40	407	20.31	63.64
Mg	0.08229	18.6	1.53	21.06	15.0	1.23	22.42	13.0	1.07	20.87	19.8	1.63	23.20	64.9	5.34	28.13	109	8.97	28.11
Fe(+2)	0.03581	0.05	0.00	0.02	0.05	0.00	0.03	0.05	0.00	0.03	0.05	0.00	0.03	0.05	0.00	0.01	0.05	0.00	0.01
K	0.02558	7.59	0.19	2.67	6.30	0.16	2.93	7.00	0.18	3.49	7.31	0.19	2.66	14.1	0.36	1.90	18.9	0.48	1.51
Mn	0.0364	0.002	0.00	0.00	0.002	0.00	0.00	0.002	0.00	0.00	0.002	0.00	0.00	2.85	0.10	0.55	0.588	0.02	0.07
		TOTAL	7.27	100.00	TOTAL	5.50	100.00	TOTAL	5.13	100.00	TOTAL	7.02	100.00	TOTAL	18.99	100.00	TOTAL	31.91	100.00
ANIONS																			
HCO ₃ ²	0.02	268	5.36	73.06	124	2.48	43.95	207	4.14	79.35	243	4.86	69.37	575	11.50	59.14	547	10.94	33.53
SO ₄	0.02082	45.2	0.94	12.83	65.8	1.37	24.28	27.1	0.56	10.81	40.4	0.84	12.01	226	4.71	24.20	373	7.77	23.80
Cl	0.02821	20.8	0.59	8.00	28.1	0.79	14.05	13.2	0.37	7.14	17.4	0.49	7.01	111	3.13	16.10	290	8.18	25.07
CO ₃ ²	0.02	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
NO ₃	0.0714	6.28	0.45	6.11	14	1.00	17.72	1.97	0.14	2.70	11.4	0.81	11.62	1.53	0.11	0.56	80.4	5.74	17.59
		TOTAL	7.34	100.00	TOTAL	5.64	100.00	TOTAL	5.22	100.00	TOTAL	7.01	100.00	TOTAL	19.45	100.00	TOTAL	32.63	100.00
anion + cation Sum (meq/L)		14.60			11.15			10.34			14.03			38.43			64.54		
(meq/L cations- anions)/(meq/L cations+anions)*100		-0.47			-1.24			-0.89			0.12			-1.20			-1.11		

Cation/Anion Balance Calculations (Dissolved Metals), Horn Rapids Landfill, Fourth Quarter 2025

Conversion Factor ¹ (mg/L to meq/L)		MW-8			MW-9			MW-10			MW-11			MW-12		
		Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)	Value (mg/L)	Value (meq/L)	Percent of Total (meq/L)
CATIONS																
Na	0.0435	19.9	0.87	13.88	25.1	1.09	9.87	31.9	1.39	5.40	21.5	0.94	4.73	21.5	0.94	15.73
Ca	0.0499	77.1	3.85	61.69	141	7.04	63.59	349	17.42	67.81	273	13.62	68.94	74.3	3.71	62.34
Mg	0.08229	16.1	1.32	21.25	32.7	2.69	24.32	78.1	6.43	25.03	59.3	4.88	24.70	13.4	1.10	18.54
Fe(+2)	0.03581	0.05	0.00	0.03	0.05	0.00	0.02	0.319	0.01	0.04	0.05	0.00	0.01	0.05	0.00	0.03
K	0.02558	7.68	0.20	3.15	9.55	0.24	2.21	16.4	0.42	1.63	12.5	0.32	1.62	7.81	0.20	3.36
Mn	0.0364	0.002	0.00	0.00	0.002	0.00	0.00	0.553	0.02	0.08	0.002	0.00	0.00	0.002	0.00	0.00
		TOTAL	6.24	100.00	TOTAL	11.06	100.00	TOTAL	25.68	100.00	TOTAL	19.76	100.00	TOTAL	5.95	100.00
ANIONS																
HCO ₃ ²	0.02	174	3.48	54.79	363	7.26	65.26	665	13.30	52.20	161	3.22	15.54	206	4.12	69.16
SO ₄	0.02082	55.5	1.16	18.19	80.6	1.68	15.08	308	6.41	25.17	379	7.89	38.08	40	0.83	13.98
Cl	0.02821	30.2	0.85	13.41	54.5	1.54	13.82	109	3.07	12.07	204	5.75	27.77	17.8	0.50	8.43
CO ₃ ²	0.02	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
NO ₃	0.0714	12.1	0.86	13.60	9.1	0.65	5.84	37.7	2.69	10.56	54	3.86	18.61	7.04	0.50	8.44
		TOTAL	6.35	100.00	TOTAL	11.13	100.00	TOTAL	25.48	100.00	TOTAL	20.72	100.00	TOTAL	5.96	100.00
anion + cation Sum (meq/L)		12.59			22.19			51.16			40.48			11.90		
(meq/L cations- anions)/(meq/L cations+anions)*100		-0.92			-0.27			0.39			-2.38			-0.09		

¹Reference: Hem 1985.²HCO₃ and CO₃ reported as CaCO₃, conversion factor adjusted accordingly.
 = Outside WAC 173-351-420(5)(a) acceptable range

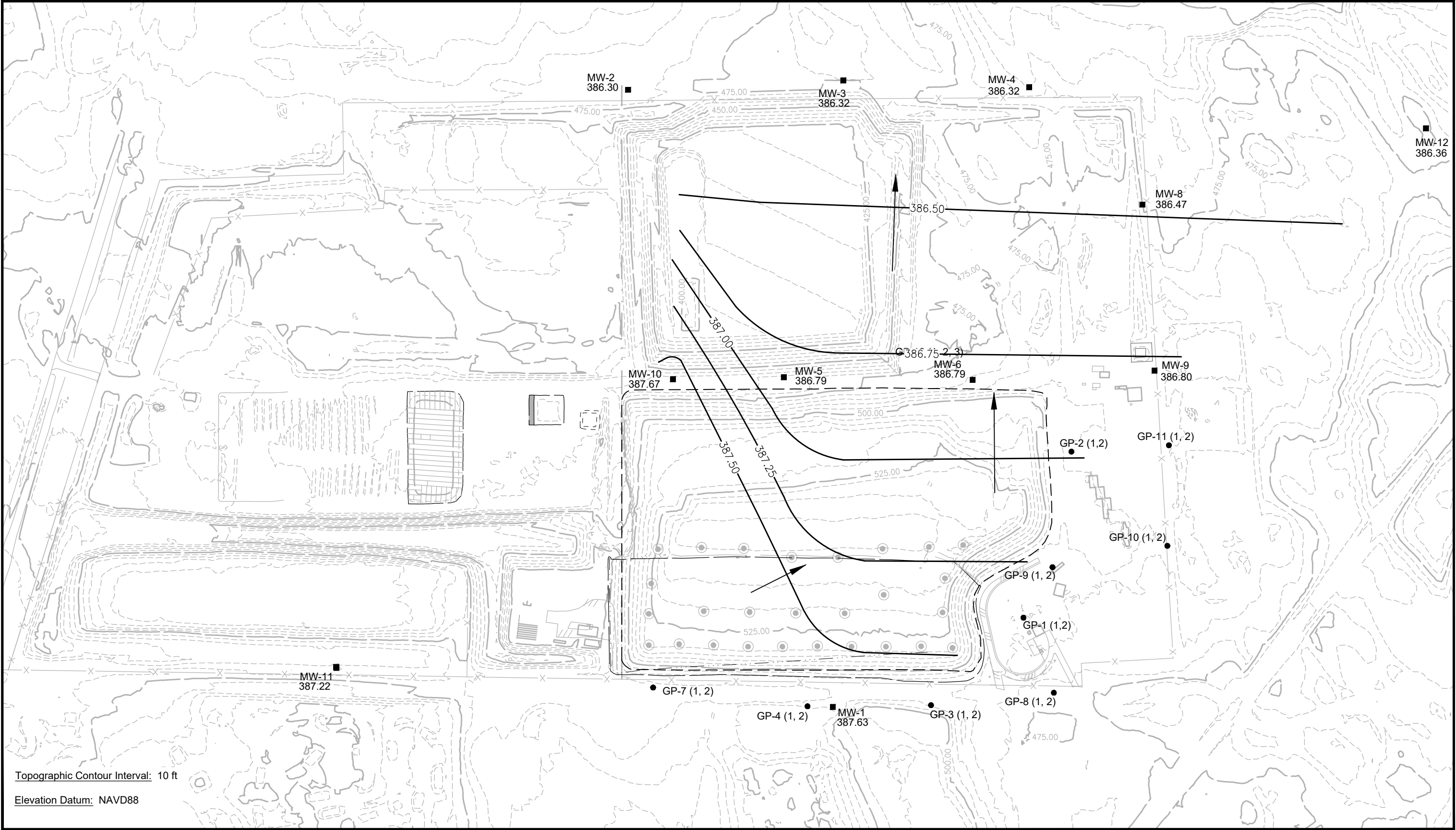
Note: Values for cations in groundwater samples are measured as dissolved (field-filtered).

5 percent if anion plus cation sum greater than 5 meq/L; 10 percent if anion plus cation sum less than 5 meq/L

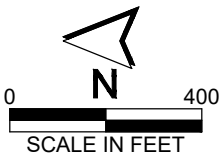
Appendix G

Groundwater Data and Potentiometric Surface Maps

FILE: BL3820004P04T02-F-G1-1stQ2025 LAYOUT: G1 PATH: U:\P50\Projects\Clients\3820-004 HornRapids201EM\995ves\CADD\555-3820-004\Phase_04\Task_02\Figures\ PLOTTED BY: purgobut DATE: Friday, May 16, 2025 2:13:49 PM



Parametrix DATE: May 16, 2025 FILE: BL3820004P04T02-F-G1-1stQ2025

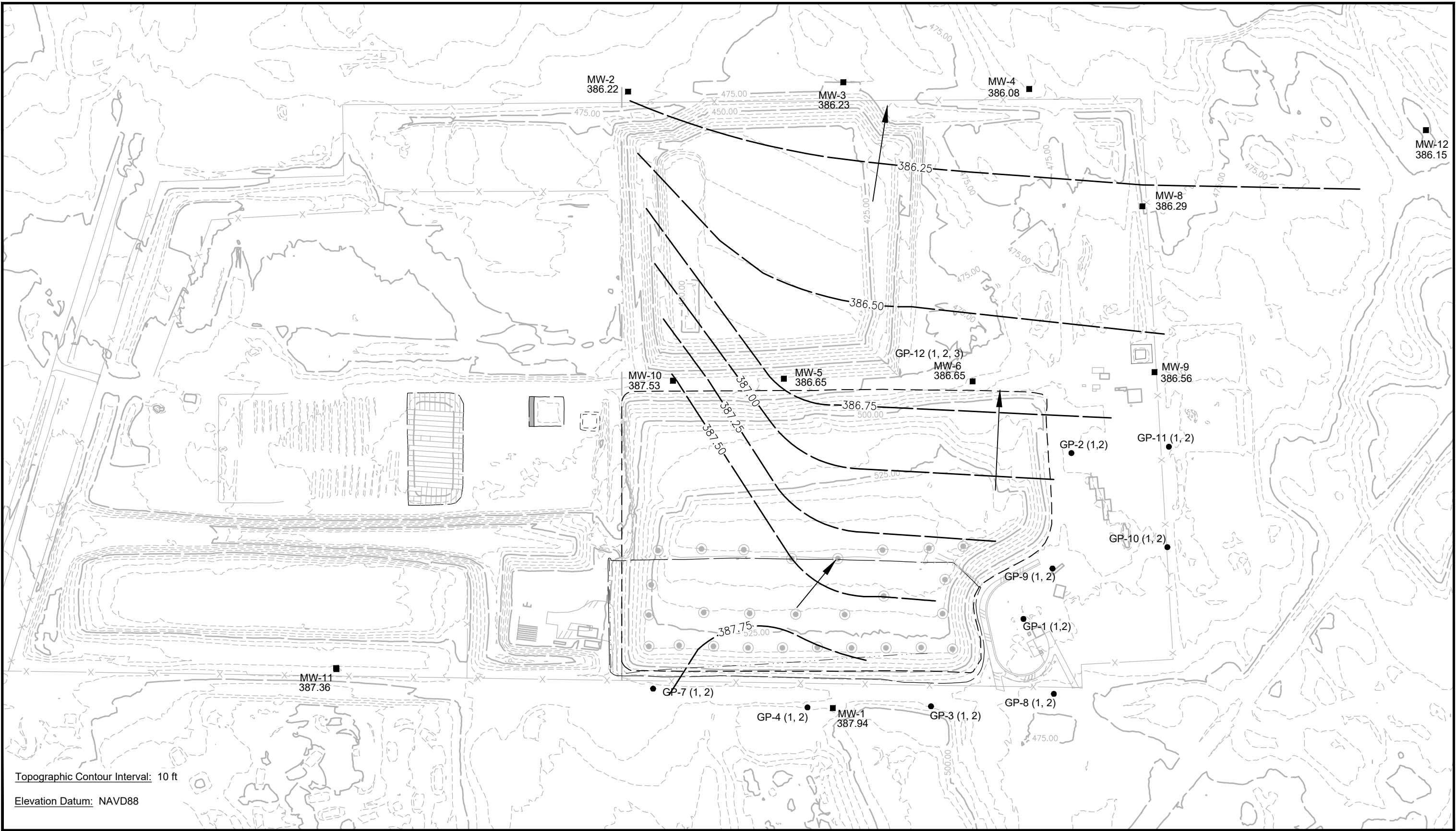


- Legend:**
- Approximate extent of refuse
 - Approximate site boundary
 - Groundwater elevation contour
 - Approximate groundwater flow direction

- Monitoring Stations**
- Monitoring well, with groundwater elevation in ft NAVD88 measured March 18 and 19, 2025
 - Gas Probe (1, 2, 3) with variable-depth screens

Figure G1
Potentiometric Surface Map
First Quarter 2025
Horn Rapids Landfill

FILE: BL3820004P04T02-F-G1-2ndQ2025 LAYOUT: G1 PATH: U:\PSC\Projects\Clients\3820-City of Richmond\555-3820-004 HornRapid201\EM\995\cs\CADD\555-3820-004\Phase 04\Task 02\Figures\ PLOTTED BY: purgubut DATE: Tuesday, August 26, 2025 11:29:44 PM



Parametrix DATE: Aug 26, 2025 FILE: BL3820004P04T02-F-G1-2ndQ2025

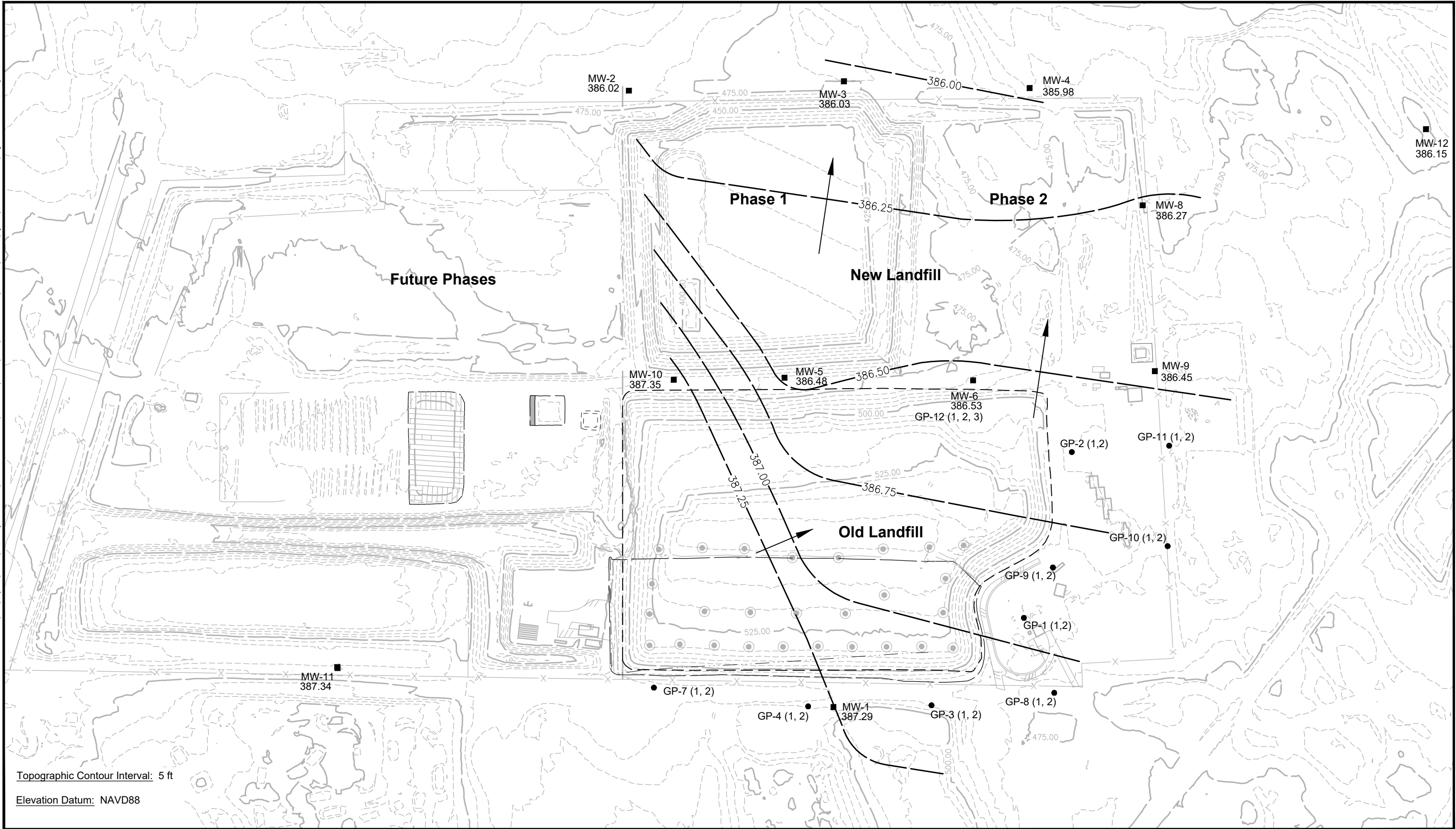
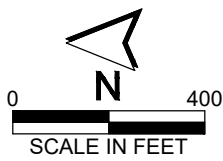


- Legend:**
- Approximate extent of refuse
 - Approximate site boundary
 - Groundwater elevation contour
 - Approximate groundwater flow direction

- Monitoring Stations**
- Monitoring well, with groundwater elevation in ft NAVD88 measured June 25 and 26, 2025
 - Gas Probe (1, 2, 3) with variable-depth screens

Figure G2
Potentiometric Surface Map
Second Quarter 2025
Horn Rapids Landfill

FILE: BL3820004P04T02-F-G1-3rdQ2025 LAYOUT: G1 PATH: U:\FSO\Projects\Clients\3820-City of Richland\555-3820-004 HornRapid201EM\995cs\CADD\555-3820-004\Phase 04\Task 02\Figures\ PLOTTED BY: purgout DATE: Thursday, December 4, 2025 11:41:59 AM



- Legend:**
- Approximate extent of refuse
 - Approximate site boundary
 - Groundwater elevation contour
 - Approximate groundwater flow direction

- Monitoring Stations**
- Monitoring well, with groundwater elevation in ft NAVD88 measured September 15 and 16, 2025
 - Gas Probe (1, 2, 3) with variable-depth screens

**Figure G3
Potentiometric Surface Map
Third Quarter 2025
Horn Rapids Landfill**

FILE: BL3820004P04T02-F-G1-4thQ2025 LAYOUT: G1 PATH: U:\FSO\Projects\Clients\3820-004 HornRapid2011EM\995ca\CADD\555-3820-004\Phase 04\Task 02\Figures\ PLOTTED BY: purgubut DATE: Tuesday, March 17, 2026 4:15:30 PM

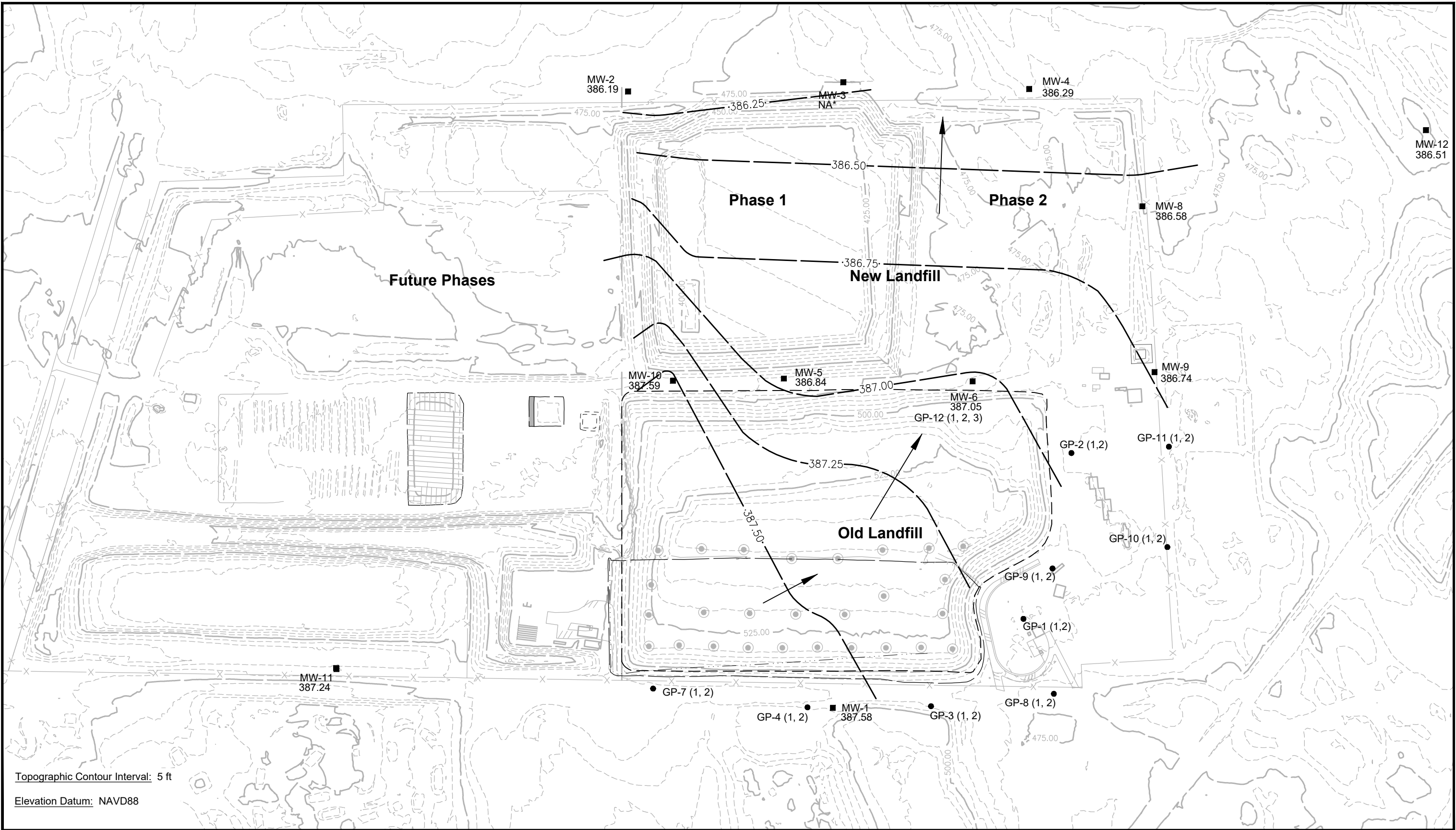


Figure G1
Potentiometric Surface Map
Fourth Quarter 2025
Horn Rapids Landfill

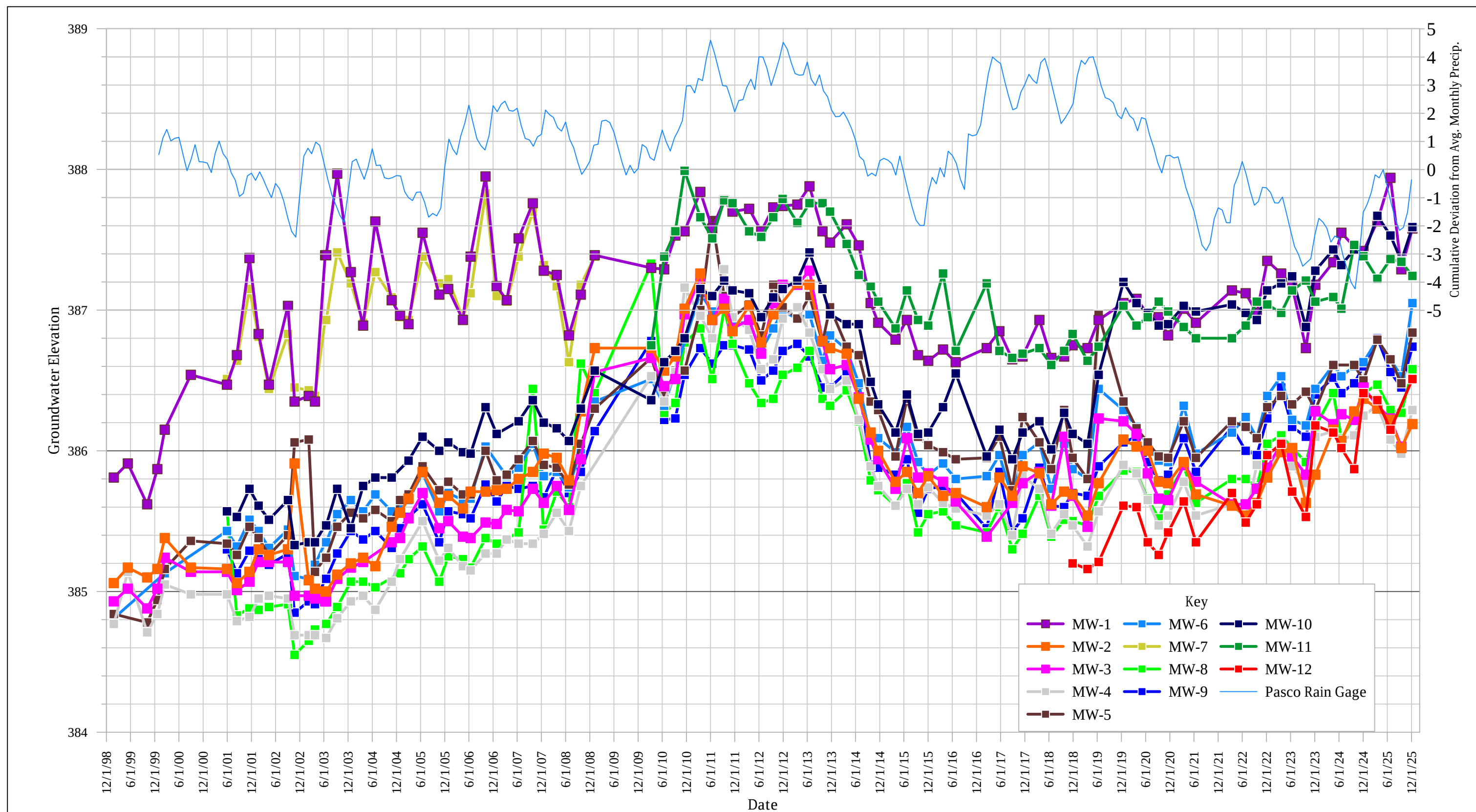


Table G-1. Groundwater Elevation Data, First Quarter 2025, Horn Rapids Landfill

Well	Northing ¹	Easting	Reference Elevation (NAVD88) ²	Depth to water (ft)	Groundwater Elevation (NAVD88)
MW-1	371,572.00	2,291,691.97	489.68	102.05	387.63
MW-2	372,460.09	2,294,368.28	469.73	83.43	386.30
MW-3	371,529.10	2,294,408.23	481.28	94.96	386.32
MW-4	370,722.92	2,294,379.43	462.52	76.20	386.32
MW-5	371,784.64	2,293,120.19	469.94	83.15	386.79
MW-6	370,965.00	2,293,109.43	484.54	97.75*	386.79
MW-8	370,228.88	2,293,869.87	476.47	90.00	386.47
MW-9	370,175.53	2,293,150.76	490.75	103.95	386.80
MW-10	372,265.23	2,293,111.61	464.08	76.41	387.67
MW-11	373,725.48	2,291,860.98	481.16	93.94	387.22
MW-12	368,946.27	1,934,322.73	477.63	91.27	386.36

Groundwater levels measured on March 18 and 19, 2025

Notes:

¹Northing and Easting will be updated with new survey data

²Updated to NAVD88 in accordance with Ecology guidance

³Resurveyed in December 2019 to reflect monument adjustment during construction at expansion area

Table G-2. Groundwater Elevation Data, Second Quarter 2025, Horn Rapids Landfill

Well	Northing ¹	Easting	Reference Elevation (NAVD88) ²	Depth to water (ft)	Groundwater Elevation (NAVD88)
MW-1	371,572.00	2,291,691.97	489.68	101.74	387.94
MW-2	372,460.09	2,294,368.28	469.73	83.51	386.22
MW-3	371,529.10	2,294,408.23	481.28	95.05	386.23
MW-4	370,722.92	2,294,379.43	462.52	76.44	386.08
MW-5	371,784.64	2,293,120.19	469.94	83.29	386.65
MW-6	370,965.00	2,293,109.43	484.54	97.89	386.65
MW-8	370,228.88	2,293,869.87	476.47	90.18*	386.29
MW-9	370,175.53	2,293,150.76	490.75	104.19	386.56
MW-10	372,265.23	2,293,111.61	464.08	76.55	387.53
MW-11	373,725.48	2,291,860.98	481.16	93.80	387.36
MW-12	368,946.27	1,934,322.73	477.63	91.48	386.15

Groundwater levels measured on June 25 and 26, 2025

Notes:

¹Northing and Easting will be updated with new survey data

²Updated to NAVD88 in accordance with Ecology guidance

³Resurveyed in December 2019 to reflect monument adjustment during construction at expansion area

*Field measurement corrected

Table G-3. Groundwater Elevation Data, Third Quarter 2025, Horn Rapids Landfill

Well	Northing ¹	Easting	Reference Elevation (NAVD88) ²	Depth to water (ft)	Groundwater Elevation (NAVD88)
MW-1	371,572.00	2,291,691.97	489.68	102.39	387.29
MW-2	372,460.09	2,294,368.28	469.73	83.71	386.02
MW-3	371,529.10	2,294,408.23	481.28	95.25	386.03
MW-4	370,722.92	2,294,379.43	462.52	76.54	385.98
MW-5	371,784.64	2,293,120.19	469.94	83.46	386.48
MW-6	370,965.00	2,293,109.43	484.54	98.01	386.53
MW-8	370,228.88	2,293,869.87	476.47	90.20	386.27
MW-9	370,175.53	2,293,150.76	490.75	104.30	386.45
MW-10	372,265.23	2,293,111.61	464.08	76.73	387.35
MW-11	373,725.48	2,291,860.98	481.16	93.82	387.34
MW-12	368,946.27	1,934,322.73	477.63	NA	NA

Groundwater levels measured on September 15 and 16, 2025

Notes:

¹Northing and Easting will be updated with new survey data

²Updated to NAVD88 in accordance with Ecology guidance

³Resurveyed in December 2019 to reflect monument adjustment during construction at expansion area

*Field measurement corrected

Table G-4. Groundwater Elevation Data, Fourth Quarter 2025, Horn Rapids Landfill

Well	Northing ¹	Easting	Reference Elevation (NAVD88) ²	Depth to water (ft)	Groundwater Elevation (NAVD88)
MW-1	371,572.00	2,291,691.97	489.68	102.10	387.58
MW-2	372,460.09	2,294,368.28	469.73	83.54	386.19
MW-3	371,529.10	2,294,408.23	481.28	NA	NA
MW-4	370,722.92	2,294,379.43	462.52	76.23	386.29
MW-5	371,784.64	2,293,120.19	469.94	83.10	386.84
MW-6	370,965.00	2,293,109.43	484.54	97.49	387.05
MW-8	370,228.88	2,293,869.87	476.47	89.89	386.58
MW-9	370,175.53	2,293,150.76	490.75	104.01	386.74
MW-10	372,265.23	2,293,111.61	464.08	76.49	387.59
MW-11	373,725.48	2,291,860.98	481.16	93.92	387.24
MW-12	368,946.27	1,934,322.73	477.63	91.12	386.51

Groundwater levels measured on December 8 and 9, 2025

Notes:

¹Northing and Easting will be updated with new survey data

²Updated to NAVD88 in accordance with Ecology guidance

³Resurveyed in December 2019 to reflect monument adjustment during construction at expansion area

NA = Not available

Appendix H

Landfill Gas Data

HORN RAPIDS LANDFILL

PERIMETER GAS MONITORING DATA

NAME Heather Zanin

EMPL. # 4836

DATE: 3/31/2025

WEATHER

START Overcast

FINISH Overcast

TEMP

48

54

BAROMOETER

Comments:

Well Location/Port	Pressure ("wc)	Methane (CH ₄ %)	Carbon Dioxide (CO ₂ &)	Oxygen (O ₂ %)	Bal	Comments: Barometer
GP - 1-1	-0.13	0.0	0.1	21.3	78.7	29.31
GP - 1-2	-0.11	0.0	0.0	21.3	78.7	29.32
GP - 2-1	-0.13	0.0	0.1	21.3	78.6	29.32
GP - 2-2	-0.18	0.0	0.1	21.3	78.7	29.31
GP - 3-1	-0.17	0.0	0.1	21.5	78.5	29.31
GP - 3-2	-0.21	0.0	0.0	21.6	78.4	29.31
GP - 4-1	-0.31	0.0	0.1	21.3	78.6	29.31
GP - 4-2	-0.26	0.0	0.3	21.2	78.5	29.31
GP - 7-1	-0.18	0.0	0.2	20.9	79.0	29.27
GP - 7-2	-0.11	0.0	0.1	20.9	79.0	29.30
GP - 8-1	-0.13	0.0	0.3	21.1	78.6	29.31
GP - 8-2	-0.17	0.0	0.2	21.3	78.5	29.33
GP - 9-1	-0.12	0.0	0.1	21.3	78.7	29.31
GP - 9-2	-0.14	0.0	0.0	21.4	78.7	29.32
GP - 10-1	-0.17	0.0	0.0	21.5	78.5	29.33
GP - 10-2	-0.16	0.0	0.1	21.3	78.5	29.31
GP - 11-1	-0.13	0.0	0.2	21.4	78.5	29.3
GP - 11-2	-0.12	0.0	0.1	21.5	78.6	29.31
GP - 12R-1	-0.09	0.0	0.0	21.2	78.7	29.33
GP - 12R-2	-0.09	0.0	0.1	21.3	78.7	29.31
GP - 12R-3	-0.15	0.0	0.1	21.2	78.8	29.31
GP - 13-1	-0.13	0.0	0.0	21.4	78.6	29.32
GP - 14-1	-0.15	0.0	0.0	21.1	78.6	29.32
GP - 15-1	-0.13	0.0	0.1	21.3	78.7	29.31

HORN RAPIDS LANDFILL

PERIMETER GAS MONITORING DATA

NAME Efren Alvarez

EMPL. # 5475

DATE: 6/30/2025

WEATHER

TEMP

BAROMOETER

START Sunny

80

FINISH Sunny

87

Comments: _____

Well Location/Port	Pressure ("wc)	Methane (CH ₄ %)	Carbon Dioxide (CO ₂ &)	Oxygen (O ₂ %)	Bal	Comments: Barometer
GP - 1-1	0.19	0.0	0.2	18.7	81.1	29.52
GP - 1-2	0.25	0.0	0.1	18.8	81.1	29.52
GP - 2-1	0.35	0.0	12.2	3.9	83.9	29.52
GP - 2-2	0.49	0.0	8.5	9.5	82.0	29.53
GP - 3-1	0.16	0.0	0.6	19.2	80.2	29.50
GP - 3-2	0.15	0.0	0.6	19.2	80.3	29.50
GP - 4-1	0.03	0.0	0.1	19.9	80.0	29.50
GP - 4-2	0.09	0.0	0.4	19.5	80.2	29.50
GP - 7-1	-0.10	0.0	0.1	20.5	79.3	29.42
GP - 7-2	0.00	0.0	0.2	20.3	79.6	29.50
GP - 8-1	0.23	0.0	0.1	19.1	80.7	29.49
GP - 8-2	0.15	0.0	0.4	18.8	80.8	29.52
GP - 9-1	0.39	0.0	3.2	15.5	81.3	29.52
GP - 9-2	0.30	0.0	0.4	18.6	81.0	29.53
GP - 10-1	0.24	0.0	1.7	17.5	80.9	29.51
GP - 10-2	0.29	0.0	1.6	17.5	80.8	29.50
GP - 11-1	0.33	0.0	0.8	18.0	81.2	29.51
GP - 11-2	0.36	0.0	0.3	18.7	81.0	29.50
GP - 12R-1	0.35	0.0	0.0	19.8	80.2	29.53
GP - 12R-2	0.26	0.0	3.7	15.7	80.6	29.53
GP - 12R-3	0.35	0.0	0.1	19.5	80.4	29.53
GP - 13-1	0.47	0.0	0.2	19.0	80.9	29.51
GP - 14-1	0.28	0.0	0.1	19.0	80.9	29.54
GP - 15-1	0.32	0.0	0.2	18.8	81.1	29.53

HORN RAPIDS LANDFILL

PERIMETER GAS MONITORING DATA

NAME Efren Alvarez

EMPL. # 5475

DATE: 9/29/2025

WEATHER

TEMP

BAROMOETER

START Cloudy

76

FINISH Cloudy

74

Comments:

Well Location/Port	Pressure ("wc)	Methane (CH ₄ %)	Carbon Dioxide (CO ₂ &)	Oxygen (O ₂ %)	Bal	Comments: Barometer
GP - 1-1	0.29	0.1	0.7	19.4	79.7	29.26
GP - 1-2	0.30	0.2	0.7	19.5	79.6	29.26
GP - 2-1	0.36	0.2	3.0	17.4	79.4	29.24
GP - 2-2	0.44	0.2	1.1	20.1	78.6	29.24
GP - 3-1	0.24	0.1	0.5	19.7	79.7	29.26
GP - 3-2	0.19	0.1	0.5	19.7	79.7	29.25
GP - 4-1	0.12	0.0	0.4	19.8	79.7	29.26
GP - 4-2	0.05	0.2	0.5	19.7	79.6	29.26
GP - 7-1	-0.03	0.2	0.2	20.0	79.5	29.25
GP - 7-2	-0.05	0.2	0.4	19.9	79.5	29.26
GP - 8-1	0.20	0.1	0.4	19.4	80.1	29.26
GP - 8-2	0.20	0.1	0.4	19.4	80.1	29.27
GP - 9-1	0.59	0.2	1.2	19.0	79.6	29.23
GP - 9-2	0.31	0.2	1.0	19.1	79.7	29.25
GP - 10-1	0.29	0.1	2.1	17.8	80.0	29.27
GP - 10-2	0.16	0.1	2.4	16.7	80.8	29.26
GP - 11-1	0.29	0.1	0.4	19.7	79.8	29.26
GP - 11-2	0.31	0.2	0.7	19.2	79.9	29.26
GP - 12R-1	0.17	0.2	0.1	20.7	79.0	29.27
GP - 12R-2	0.09	0.2	0.2	20.6	79.0	29.25
GP - 12R-3	0.33	0.2	1.7	18.7	79.4	29.25
GP - 13-1	0.19	0.1	0.5	20.0	79.4	29.26
GP - 14-1	0.12	0.2	0.3	20.2	79.4	29.26
GP - 15-1	0.09	0.2	0.2	20.3	79.3	29.27

HORN RAPIDS LANDFILL

PERIMETER GAS MONITORING DATA

NAME Efren Alvarez

EMPL. # 5475

DATE: 12/5/2025

WEATHER

TEMP

BAROMOETER

START Cloudy

42

FINISH Cloudy

35

Comments:

Well Location/Port	Pressure ("wc)	Methane (CH ₄ %)	Carbon Dioxide (CO ₂ &)	Oxygen (O ₂ %)	Bal	Comments: Barometer
GP - 1-1	0.51	0.0	1.0	21.6	77.4	29.27
GP - 1-2	0.52	0.0	0.8	21.6	77.5	29.28
GP - 2-1	0.48	0.0	17.1	1.3	81.6	29.26
GP - 2-2	1.10	0.0	17.3	1.3	81.4	29.26
GP - 3-1	1.96	0.0	0.9	21.8	77.3	29.28
GP - 3-2	1.37	0.0	0.8	21.8	77.3	29.27
GP - 4-1	1.43	0.0	0.7	21.8	77.5	29.30
GP - 4-2	1.17	0.0	0.7	21.9	77.5	29.28
GP - 7-1	0.53	0.0	0.4	21.3	78.2	29.30
GP - 7-2	0.16	0.0	0.3	21.3	78.4	29.29
GP - 8-1	0.75	0.0	0.9	21.2	77.9	29.27
GP - 8-2	0.66	0.0	0.9	21.3	77.9	29.29
GP - 9-1	2.17	0.0	4.6	17.4	78.0	29.29
GP - 9-2	0.78	0.0	1.6	20.4	78.0	29.28
GP - 10-1	1.43	0.0	5.1	17.0	77.9	29.29
GP - 10-2	0.49	0.0	3.4	18.2	78.4	29.27
GP - 11-1	0.63	0.0	1.2	21.4	77.4	29.27
GP - 11-2	0.41	0.0	1.0	21.6	77.4	29.27
GP - 12R-1	0.17	0.0	9.7	13.6	76.8	29.27
GP - 12R-2	-0.22	0.0	6.8	15.7	77.6	29.25
GP - 12R-3	0.31	0.0	10.3	13.4	76.3	29.25
GP - 13-1	-0.24	0.0	0.7	29.9	77.3	29.27
GP - 14-1	-0.21	0.0	0.3	21.3	78.3	29.27
GP - 15-1	-0.28	0.0	0.3	22.0	77.6	29.25

Appendix I

Field Data Sheets

Groundwater Sampling Field Data Sheet

Well #: **MW-01**

Project Number: <u>555-3820-004</u>		Date: <u>3/19/25</u>	
Project Name: <u>Horn Rapids Landfill</u>		Client Name: <u>City of Richland</u>	
Project Address: <u>3102 Twin Bridges Road</u> <u>Richland, WA 99354</u>		Sampled By: <u>Nguyen</u> Purged By: <u>Nguyen</u>	

Casing Diameter: <u>2" x</u> <u>4"</u> <u>6"</u> Other <u> </u>
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Initial Depth to Water (feet): <u>102.05'</u>	Purge Flow Rate Measurement Method: <u>Graduated Cylinder</u>
Depth of Well (feet): <u>139</u>	Date Purged: <u>3/19</u>
Top of Screen (feet): <u>114</u>	Purge Time (from/to): <u>1439 - 1520</u>
Reference Point (surveyor's notch, etc.): <u> </u>	Time Sampled: <u>1500</u>

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	<u>102.05'</u>							
<u>1440</u>	<u>102.05'</u>	<u>7.17</u>	<u>638</u>	<u>15.9</u>	<u>-150.6</u>	<u>6.00</u>	<u>1.62</u>	<u>3.6A</u>
<u>1445</u>	<u>"</u>	<u>7.09</u>	<u>642</u>	<u>16.5</u>	<u>-151.9</u>	<u>5.93</u>	<u>0.67</u>	<u>"</u>
<u>1450</u>	<u>"</u>	<u>6.99</u>	<u>650</u>	<u>18.9</u>	<u>-147.8</u>	<u>5.70</u>	<u>0.80</u>	<u>"</u>
<u>1455</u>	<u>"</u>	<u>6.96</u>	<u>660</u>	<u>20.0</u>	<u>-147.2</u>	<u>5.27</u>	<u>0.44</u>	<u>"</u>
<u>1500</u>	<u>"</u>	<u>6.93</u>	<u>663</u>	<u>20.5</u>	<u>-146.9</u>	<u>5.23</u>	<u>0.65</u>	<u>"</u>

Purge Equipment: <u>Dedicated Submersible</u>	Sampling Equipment: <u>Dedicated Submersible</u>
Purge Flow Rate: <u>400 ml/min</u>	Sampling Flow Rate: <u> </u>
Field Parameter Instrument <u> </u>	

Laboratory: <u>ARI</u>	Date Sent to Lab: <u> </u>
<u>Energy Northwest (nitrate)</u>	
Shipment Method: <u>Hand</u>	Field QC Sample Number: <u> </u>

Well Integrity: <u> </u>
Remarks: <u> </u>
Signature: <u></u>

Groundwater Sampling Field Data Sheet

Well #: **MW-02**

Project Number: 555-3820-004		Date: 3/19/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: <i>Noguyen</i>	
Richland, WA 99354		Purged By: <i>Noguyen</i>	

Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐
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Initial Depth to Water (feet): 83.43'	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 123	Date Purged: 3/19
Top of Screen (feet): 98	Purge Time (from/to): 943 - 1033
Reference Point (surveyor's notch, etc.):	Time Sampled: 950

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L(± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	83.43'							
945	83.43'	7.39	615	15.7	-95.0	7.08	6.90	3.6A
950	"	7.38	615	16.3	-97.5	6.70	5.32	"
955	"	7.38	615	17.0	-98.1	6.48	4.43	"

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 350 mL/min	Sampling Flow Rate:
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab:
Energy Northwest (nitrate)	
Shipment Method: Hand	Field QC Sample Number: MW-21 @ "1016"

Well Integrity:
Remarks: WL meter very dirty after pulling it out of the well.
Signature: <i>[Signature]</i>

Groundwater Sampling Field Data Sheet

Well #: **MW-03**

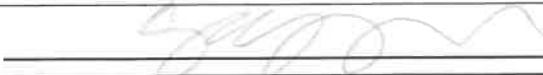
Project Number: 555-3820-004		Date: 3/18/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: Nguyen	
Richland, WA 99354		Purged By: Nguyen	

Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐
--

Initial Depth to Water (feet): 94.96'	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 136	Date Purged: 3/18
Top of Screen (feet): 111	Purge Time (from/to): 1728 - 1815
Reference Point (surveyor's notch, etc.):	Time Sampled: 1800

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L(± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	94.96'							
1730	94.99'	7.95	315.3	16.6	-183.6	15.69	1.27	3.9A
1735	"	7.88	316.6	16.6	-160.1	13.85	0.72	3.9A
1740	"	7.90	316.0	16.9	-169.2	12.47	0.55	"
1745	95.00'	7.87	317.2	18.0	-172.2	11.05	1.63	"
1750	"	7.71	320.9	22.7	-160.4	6.63	0.83	3.9A
1755	"	7.65	322.0	24.0	-154.0	6.60	2.02	"
1800	"	7.65	320.4	23.6	-153.2	6.76	1.80	"

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 300 mL/min	Sampling Flow Rate:
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab:
Energy Northwest (nitrate)	
Shipment Method: hand	Field QC Sample Number:

Well Integrity:
Remarks: * noticed kink in tubing, when undone, DO dropped.
Signature: 

Groundwater Sampling Field Data Sheet

Well #: **MW-04**

Project Number: 555-3820-004		Date: 3/19/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Sampled By: Nguyen Purged By: Nguyen	

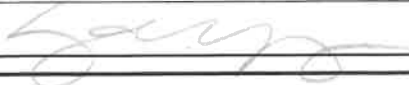
Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐
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Initial Depth to Water (feet): 76.20'	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 115	Date Purged:
Top of Screen (feet): 90	Purge Time (from/to): 1546 - 1630
Reference Point (surveyor's notch, etc.):	Time Sampled: 1610

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	76.20'							
1550	76.21'	7.47	639	16.6	-154.1	4.28	0.74	3.5A
1555	"	7.40	642	17.2	-153.6	4.15	0.50	"
1600	"	7.32	649	19.1	-151.8	3.70	0.70	"
1605	"	7.31	649	19.7	-152.0	3.64	0.67	"
1610	"	7.29	656	19.9	-152.5	3.62	0.55	"

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 350 mL/min	Sampling Flow Rate:
Field Parameter Instrument	

Laboratory: ARI	Date Sent to Lab:
Energy Northwest (nitrate)	
Shipment Method: Hand	Field QC Sample Number:

Well Integrity:
Remarks:
Signature: 

Groundwater Sampling Field Data Sheet

Well #: **MW-05**

Project Number: 555-3820-004		Date: 3/19/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Sampled By: Nguyen Purged By: Nguyen	
Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐			
Initial Depth to Water (feet): 83.15'		Purge Flow Rate Measurement Method: Graduated Cylinder	
Depth of Well (feet): 101		Date Purged: 3/19	
Top of Screen (feet): 91		Purge Time (from/to): 1216 - 1321	
Reference Point (surveyor's notch, etc.):		Time Sampled: 1310	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	83.15'							
1220	83.20'	6.41	1605	18.5	-182.9	2.64	1.14	3.64
1225	"	6.29	1734	19.0	-169.4	2.23	1.09	"
1230	"	6.22	1703	20.7	-165.3	1.70	0.76	"
1235	"	6.22	1657	23.0	-168.4	1.28	0.86	"
1240	"	6.19	1628	24.0	-170.0	1.02	1.14	"
1245	"	6.18	1587	24.6	-171.3	0.83	0.84	"
1250	"	6.18	1560	25.1	-172.3	0.55	0.76	"
1255	"	6.17	1536	25.6	-173.3	0.42	0.66	"

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 375 mL/min	Sampling Flow Rate:
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab:
Energy Northwest (nitrate)	
Shipment Method: Hand	Field QC Sample Number:

Well Integrity:
Remarks:
Signature:

TIME	DEPTH	pH	Ec	TEMP	Redox	DO	TURB	PUMP SETTING
1300	83.20'	6.20	1490	24.6	-173.0	0.39	0.52	3.64
1305	"	6.21	1458	24.3	-175.9	0.28	0.82	"
1310	"	6.23	1446	24.2	-177.4	0.25	0.68	"

Groundwater Sampling Field Data Sheet

Well #: **MW-06**

Project Number: 555-3820-004		Date: 3/19/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Sampled By: Nguyen Purged By: Nguyen	
Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐			
Initial Depth to Water (feet): 87.75'		Purge Flow Rate Measurement Method: Graduated Cylinder	
Depth of Well (feet): 116		Date Purged: 3/19	
Top of Screen (feet): 106		Purge Time (from/to): 1059 - 1155	
Reference Point (surveyor's notch, etc.):		Time Sampled: 1130	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	87.75'							
1100	87.80'	6.33	1758	18.3	-252.6	0.69	2.06	3.8A
1105	"	6.28	1799	18.8	-194.2	0.61	1.03	"
1110	"	6.25	1788	19.8	-168.7	0.50	1.04	"
1115	"	6.25	1759	20.0	-162.7	0.47	0.89	"
1120	"	6.22	1706	21.2	-168.9	0.41	1.41	"
1125	"	6.19	1672	22.7	-176.7	0.38	0.98	"
1130	"	6.17	1654	23.4	-178.1	0.38	1.47	"

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 400 mL/min	Sampling Flow Rate:
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab:
Energy Northwest (nitrate)	
Shipment Method: Hand	Field QC Sample Number:

Well Integrity:
Remarks:
Signature: 

Groundwater Sampling Field Data Sheet

Well #: **MW-08**

Project Number: <u>555-3820-004</u>		Date: <u>3/18/25</u>	
Project Name: <u>Horn Rapids Landfill</u>		Client Name: <u>City of Richland</u>	
Project Address: <u>3102 Twin Bridges Road</u> <u>Richland, WA 99354</u>		Sampled By: <u>Nguyen</u> Purged By: <u>Nguyen</u>	
Casing Diameter: 2" <u>X</u> 4" <u> </u> 6" <u> </u> Other <u> </u>			
Initial Depth to Water (feet): <u>90.00</u>		Purge Flow Rate Measurement Method: <u>Graduated Cylinder</u>	
Depth of Well (feet): <u>102.5</u>		Date Purged: <u>3/18</u>	
Top of Screen (feet): <u>87.5</u>		Purge Time (from/to): <u>1547-1635</u>	
Reference Point (surveyor's notch, etc.): <u> </u>		Time Sampled: <u>1615</u>	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	—	—	—	—	—	—	—	—
1550	—	7.86	915	16.6	-165.5	7.34	1.08	3.64
1555	—	7.83	907	17.1	-163.3	7.18	—	"
1600	—	7.75	906	20.0	-160.6	7.09	1.30	"
1605	—	7.68	909	20.6	-159.0	7.02	0.89	"
1610	—	7.59	903	21.7	-156.0	6.73	0.79	"
1615	—	7.59	923	21.8	-156.1	6.86	0.98	"

Purge Equipment: <u>Dedicated Submersible</u>	Sampling Equipment: <u>Dedicated Submersible</u>
Purge Flow Rate: <u>400 ml/min</u>	Sampling Flow Rate: <u> </u>
Field Parameter Instrument	
Laboratory: <u>ARI</u>	Date Sent to Lab: <u> </u>
<u>Energy Northwest (nitrate)</u>	
Shipment Method: <u>Hand</u>	Field QC Sample Number: <u> </u>

Well Integrity: <u> </u>
Remarks: <u>WL taken afterwards @ 1632</u>
Signature: <u> </u>

Groundwater Sampling Field Data Sheet

Well #: **MW-09**

Project Number: 555-3820-004		Date: 3/18/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: Nguyen	
Richland, WA 99354		Purged By: Nguyen	

Casing Diameter: 2" <u>X</u> 4" <u> </u> 6" <u> </u> Other <u> </u>
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Initial Depth to Water (feet): 103.95'	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 115.5	Date Purged: 3/18
Top of Screen (feet): 100.5	Purge Time (from/to): 1454 - 1540
Reference Point (surveyor's notch, etc.):	Time Sampled: 1525

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	—	—	—	—	—	—	—	—
1455	—	7.37	976	16.8	-232.7	3.16	2.32	3.8A
1500	—	7.26	962	17.5	-193.5	2.49	1.07	"
1505	—	7.11	961	18.0	-181.9	2.41	0.82	"
1510	—	6.93	968	19.6	-177.5	2.34	0.96	"
1515	—	6.81	971	21.7	-171.1	2.16	1.04	"
1520	—	6.76	986	23.1	-165.2	2.08	0.92	—
1525	—	6.71	985	23.5	-162.4	2.04	0.74	—

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 450 mL/min	Sampling Flow Rate: —

Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: —
Energy Northwest (nitrate)	
Shipment Method: Hand	Field QC Sample Number: —

Well Integrity:
Remarks: WL taken afterwards @ 1715
Signature: 

Groundwater Sampling Field Data Sheet

Well #: **MW-10**

Project Number: 555-3820-004		Date: 3/19/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: Nguyen	
Richland, WA 99354		Purged By: Nguyen	

Casing Diameter: 2" <u>x</u> 4" <u> </u> 6" <u> </u> Other <u> </u>	
Initial Depth to Water (feet): 76.41'	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 87.5	Date Purged: 3/19
Top of Screen (feet): 72.5	Purge Time (from/to): 1340 - 1415
Reference Point (surveyor's notch, etc.):	Time Sampled: 1355

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	76.41'							
1345	76.43'	6.24	1839	20.5	-180.7	0.46	0.91	3.6 3.7 A
1350	"	6.22	1846	20.8	-183.7	0.39	0.92	3.7A
1355	76.45'	6.14	1830	24.5	-190.1	0.18	0.99	3.64

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 500 mL/min	Sampling Flow Rate: 375 500 mL/min
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab:
Energy Northwest (nitrate)	
Shipment Method: Hand carried	Field QC Sample Number:

Well Integrity:
Remarks: Flow inconsistent due to kink in tubing
Signature: 

Groundwater Sampling Field Data Sheet

Well #: **MW-11**

Project Number: <u>555-3820-004</u>		Date: <u>3/18/25</u>	
Project Name: <u>Horn Rapids Landfill</u>		Client Name: <u>City of Richland</u>	
Project Address: <u>3102 Twin Bridges Road</u>		Sampled By: <u>Nguyen</u>	
<u>Richland, WA 99354</u>		Purged By: <u>Nguyen</u>	

Casing Diameter: <u>2" x</u> <u>4"</u> <u>6"</u> Other _____	
Initial Depth to Water (feet): <u>93.94'</u>	Purge Flow Rate Measurement Method: <u>Graduated Cylinder</u>
Depth of Well (feet): <u>105</u>	Date Purged: <u>3/18</u>
Top of Screen (feet): <u>90</u>	Purge Time (from/to): <u>1350</u> <u>5</u>
Reference Point (surveyor's notch, etc.): _____	Time Sampled: <u>1320 - 1430</u> <u>2</u>

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	—	—	—	—	—	—	—	—
1335	—	7.42	1847	18.4	-111.3	8.46	—	varies ... 4.7A
1340	—	7.43	1835	20.3	-111.9	7.80	—	—
1345	—	7.51	1856	19.4	-114.3	8.30	—	—
1350	—	7.58	1859	19.6	-115.1	8.09	over range	—

Purge Equipment: <u>Dedicated Submersible</u>	Sampling Equipment: <u>Dedicated Submersible</u>
Purge Flow Rate: <u>450 ml/min</u>	Sampling Flow Rate: _____
Field Parameter Instrument	
Laboratory: <u>ARI</u>	Date Sent to Lab: _____
<u>Energy Northwest (nitrate)</u>	
Shipment Method: <u>Hand</u>	Field QC Sample Number: _____

Well Integrity:
Remarks: <u>pump (red: flo) keeps giving out. Adjusted pump height each time.</u> <u>water very turbid.</u> <u>Error code F0001.</u>
Signature: <u>[Signature]</u>

→ WL meter broke after reading.

Groundwater Sampling Field Data Sheet

Well #: **MW-12**

Project Number: <u>555-3820-004</u>		Date: <u>3/19/25</u>	
Project Name: <u>Horn Rapids Landfill</u>		Client Name: <u>City of Richland</u>	
Project Address: <u>3102 Twin Bridges Rod</u> <u>Richland, WA 99354</u>		Sampled By: <u>N. Jensen</u> Purged By: <u>N. Jensen</u>	
Casing Diameter: <u>2" x</u> <u>4"</u> <u>6"</u> Other <u> </u>			
Initial Depth to Water (feet): <u>91.27'</u>		Purge Flow Rate Measurement Method: <u>Graduated Cylinder</u>	
Depth of Well (feet): <u>104</u>		Date Purged: <u>3/19</u>	
Top of Screen (feet): <u>89</u>		Purge Time (from/to): <u>856 - 925</u>	
Reference Point (surveyor's notch, etc.): <u> </u>		Time Sampled: <u>910</u>	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	<u>91.27'</u>							
<u>900</u>	<u>—</u>	<u>7.49</u>	<u>438.0</u>	<u>16.0</u>	<u>-87.4</u>	<u>6.16</u>	<u>over range</u>	<u>4.0</u> 3.9A
<u>905</u>	<u>—</u>	<u>7.44</u>	<u>441.1</u>	<u>19.8</u>	<u>-86.9</u>	<u>5.98</u>	<u>87.3</u>	<u>"</u>
<u>910</u>	<u>—</u>	<u>7.35</u>	<u>446.4</u>	<u>22.3</u>	<u>-88.1</u>	<u>5.87</u>	<u>37.9</u>	<u>"</u>

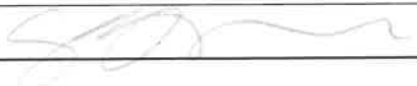
Purge Equipment: <u>Dedicated Submersible</u>	Sampling Equipment: <u>Dedicated Submersible</u>
Purge Flow Rate: <u>450 ml/min</u>	Sampling Flow Rate: <u> </u>
Field Parameter Instrument <u> </u>	

Laboratory: <u>ARI</u>	Date Sent to Lab: <u> </u>
<u>Energy Northwest (nitrate)</u>	
Shipment Method: <u>Hand</u>	Field QC Sample Number: <u> </u>

Well Integrity: <u> </u>
Remarks: <u>Cannot fit WL meter probe in while sampling.</u>
Signature: <u> </u>

Field Data Sheet

Well #: Condensate Pond

Project Number:	<u>555-3820-004</u>	Date:	<u>3/18/25</u>
Project Name:	<u>Horn Rapids Landfill</u>	Client Name:	<u>City of Richland</u>
Project Address:	<u>3102 Twin Bridges Road</u> <u>Richland, WA 99354</u>	Measured By:	<u></u>
TIME (2400 hr) <u>1214</u>	Depth to Water from top of Pipe (ft) <u>21.44'</u>	Estimated Depth of Water in Pond (ft) <u>1.75'</u>	
Remarks: <i>Top 456 ft, bottom 448 ft; approximate length of pipe 25 ft (3:1)</i>			
Signature: <u></u>			

Field Data Sheet

Well #: Leachate Pond

Project Number:	<u>555-3820-004</u>	Date:	<u>3/18/25</u>
Project Name:	<u>Horn Rapids Landfill</u>	Client Name:	<u>City of Richland</u>
Project Address:	<u>3102 Twin Bridges Road</u>	Measured By:	<u>Ngyuen</u>
	<u>Richland, WA 99354</u>		

TIME (2400 hr)	Depth to Water from top of Pipe (ft)	Estimated Depth of Water in Pond (ft)
<u>1115</u>	1000 <u>NA</u>	<u>9'</u>

Remarks:

Top 404 ft, bottom 396 ft; approximate length of pipe 25 ft (3:1)

• Difficult to take sump reading. Cords in pipe +
WL meter sensitive + kept getting stuck. ^{4 string}

• Sampled @ 1131

• Nitrate sample @ 1706

• Tracy noted pumping on Friday and there being minimal volume. Stated the fluid wasn't enough to fill a 5-gallon bucket.

<u>PH</u>	<u>Ec</u>	<u>Temp</u>	<u>Redox</u>	<u>DO</u>	<u>TURB</u>
<u>8.81</u>	<u>4704</u>	<u>9.7</u>	<u>-106.5</u>	<u>7.08</u>	<u>13.9</u>

Signature: _____

Groundwater Sampling Field Data Sheet

Well #: **MW-01**

Project Number: <u>555-3820-004</u>		Date: <u>6/25/25</u>	
Project Name: <u>Horn Rapids Landfill</u>		Client Name: <u>City of Richland</u>	
Project Address: <u>3102 Twin Bridges Road</u> <u>Richland, WA 99354</u>		Sampled By: <u>Nguyen</u> Purged By: <u>Nguyen</u>	
Casing Diameter: <u>2" x</u> <u>4"</u> <u>6"</u> Other <u> </u>			
Initial Depth to Water (feet): <u>101.74</u>		Purge Flow Rate Measurement Method: <u>Graduated Cylinder</u>	
Depth of Well (feet): <u>139</u>		Date Purged: <u>6/25</u>	
Top of Screen (feet): <u>114</u>		Purge Time (from/to): <u>753-832</u>	
Reference Point (surveyor's notch, etc.): <u>TOC</u>		Time Sampled: <u>000 815</u>	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	<u>101.74</u>							
<u>755</u>	<u>-</u>	<u>7.35</u>	<u>675</u>	<u>10.1</u>	<u>-38.1</u>	<u>5.87</u>	<u>2.74</u>	<u>3.6A</u>
<u>800</u>	<u>-</u>	<u>7.42</u>	<u>692</u>	<u>10.3</u>	<u>-45.0</u>	<u>5.86</u>	<u>1.10</u>	<u>-</u>
<u>805</u>	<u>-</u>	<u>7.65</u>	<u>699</u>	<u>21.0</u>	<u>-43.8</u>	<u>5.83</u>	<u>1.07</u>	<u>-</u>
<u>810</u>	<u>-</u>	<u>7.60</u>	<u>712</u>	<u>22.3</u>	<u>-46.6</u>	<u>5.71</u>	<u>0.84</u>	<u>-</u>
<u>815</u>	<u>-</u>	<u>7.66</u>	<u>715</u>	<u>22.0</u>	<u>-50.1</u>	<u>5.59</u>	<u>0.62</u>	<u>-</u>

Purge Equipment: <u>Dedicated Submersible</u>	Sampling Equipment: <u>Dedicated Submersible</u>
Purge Flow Rate: <u>350 mL/min</u>	Sampling Flow Rate: <u> </u>
Field Parameter Instrument	
Laboratory: <u>ARI</u>	Date Sent to Lab: <u> </u>
<u>Energy Northwest (nitrate)</u>	
Shipment Method: <u> </u>	Field QC Sample Number: <u> </u>

Well Integrity: <u> </u>
Remarks: <u>Very difficult to take WL reading. Meter gets caught on tubing.</u> <u>pH for all wells measured w/ pH pen.</u>
Signature: <u>[Signature]</u>

Groundwater Sampling Field Data Sheet

Well #: **MW-02**

Project Number: 555-3820-004		Date: 6/26/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Sampled By: Nguyen Purged By: Nguyen	
Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐			
Initial Depth to Water (feet): 83.51		Purge Flow Rate Measurement Method: Graduated Cylinder	
Depth of Well (feet): 123		Date Purged: 6/26	
Top of Screen (feet): 98		Purge Time (from/to): 947 - 1020	
Reference Point (surveyor's notch, etc.): TOC		Time Sampled: 1005.	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L(± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	83.51							
950	83.55	7.74	627	17.8	-68.9	6.53	1.47	3.6A
955	"	7.70	626	18.2	-60.8	6.48	2.99	
1000		7.78	625	19.2	-56.8	6.38	2.27	
1005		7.74	626	20.4	-59.3	6.35	2.43	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 325 mL/min	Sampling Flow Rate:
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab:
Energy Northwest (nitrate)	
Shipment Method:	Field QC Sample Number:
Well Integrity:	
Remarks:	
Signature: 	

Groundwater Sampling Field Data Sheet

Well #: **MW-03**

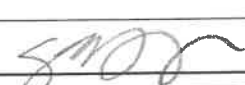
Project Number: 555-3820-004		Date: 6/25/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: Nguyen	
Richland, WA 99354		Purged By: Nguyen	

Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐
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Initial Depth to Water (feet): 95.05	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 136	Date Purged: 6/25
Top of Screen (feet): 111	Purge Time (from/to): 1717 - 1805
Reference Point (surveyor's notch, etc.): TOC	Time Sampled: 1745

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L(± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	95.05							
1720	94.92	8.24	383.7	20.4	-101.1	7.53	3.60	3.7A
1725	"	8.15	387.5	20.4	-95.9	7.36	2.05	
1730		7.88	388.1	21.4	-93.7	7.42	1.84	
1735		7.85	386.9	22.6	-99.1	7.10	1.56	
1740		7.93	386.0	22.8	-99.8	7.15	1.15	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 475 mL/min	Sampling Flow Rate:
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab:
Energy Northwest (nitrate)	
Shipment Method:	Field QC Sample Number: MW-21 (Q-400)

Well Integrity:
Remarks:
Signature: 

Groundwater Sampling Field Data Sheet

Well #: **MW-04**

Project Number: 555-3820-004		Date: 6/25/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: Ngrjen	
Richland, WA 99354		Purged By: Ngrjen	

Casing Diameter: 2" <u>x</u>	4" <u>-</u>	6" <u>-</u>	Other <u>-</u>
------------------------------	-------------	-------------	----------------

Initial Depth to Water (feet): 76.44	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 115	Date Purged: 6/25
Top of Screen (feet): 90	Purge Time (from/to): 1619 - 1700
Reference Point (surveyor's notch, etc.): TOC	Time Sampled: 1645

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	76.44							
1620	76.40	8.33	632	19.8	-127.5	4.12	1.39	3.54
1625	"	8.30	638	20.2	-125.8	3.92	1.10	
1630	"	8.09	645	21.0	-123.8	3.89	0.99	
1635	"	7.98	651	21.9	-124.0	3.84	0.53	
1640	"	7.91	650	22.5	-120.5	3.78	0.80	
1645	76.44	7.95	656	22.5	-116.8	3.71	0.66	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 450 mL/min	Sampling Flow Rate:
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab:
Energy Northwest (nitrate)	
Shipment Method:	Field QC Sample Number:

Well Integrity:
Remarks: difficult to take WL reading.
Signature: 

Well #: MW-05

Page 1 of 1

Groundwater Sampling Field Data Sheet

Well #: **MW-06**

Project Number: <u>555-3820-004</u>		Date: <u>6/25/25</u>	
Project Name: <u>Horn Rapids Landfill</u>		Client Name: <u>City of Richland</u>	
Project Address: <u>3102 Twin Bridges Road</u>		Sampled By: <u>Nguyen</u>	
<u>Richland, WA 99354</u>		Purged By: <u>Nguyen</u>	

Casing Diameter: <u>2" x</u> <u>4" _</u> <u>6" _</u> Other <u>_____</u>

Initial Depth to Water (feet): <u>97.89</u>	Purge Flow Rate Measurement Method: <u>Graduated Cylinder</u>
Depth of Well (feet): <u>116</u>	Date Purged: <u>6/25</u>
Top of Screen (feet): <u>106</u>	Purge Time (from/to): <u>1058 ~ 1032</u>
Reference Point (surveyor's notch, etc.): <u>TOC</u>	Time Sampled: <u>1115</u>

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	<u>97.89</u>							
<u>1100</u>	<u>78.01</u>	<u>7.00</u>	<u>2500</u>	<u>22.3</u>	<u>-125.2</u>	<u>0.79</u>	<u>0.36</u>	<u>3.8</u>
<u>1105</u>	<u>"</u>	<u>6.99</u>	<u>2487</u>	<u>22.5</u>	<u>-110.8</u>	<u>0.43</u>	<u>0.19</u>	<u>_____</u>
<u>1110</u>	<u>98.02</u>	<u>7.00</u>	<u>2462</u>	<u>23.3</u>	<u>-114.1</u>	<u>0.32</u>	<u>0.57</u>	<u>_____</u>
<u>1115</u>	<u>"</u>	<u>6.97</u>	<u>2412</u>	<u>25.3</u>	<u>-119.9</u>	<u>0.26</u>	<u>0.65</u>	<u>_____</u>

Purge Equipment: <u>Dedicated Submersible</u>	Sampling Equipment: <u>Dedicated Submersible</u>
Purge Flow Rate: <u>450 ml/min</u>	Sampling Flow Rate: <u>_____</u>
Field Parameter Instrument <u>_____</u>	

Laboratory: <u>ARI</u>	Date Sent to Lab: <u>_____</u>
<u>Energy Northwest (nitrate)</u>	<u>_____</u>
Shipment Method: <u>_____</u>	Field QC Sample Number: <u>_____</u>

Well Integrity: <u>_____</u>
Remarks: <u>Slight sulfur/egg smell.</u>
Signature: <u></u>

Groundwater Sampling Field Data Sheet

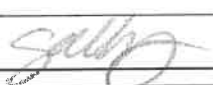
Well #: **MW-08**

Project Number: 555-3820-004		Date: 6/25/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: Nguyen	
Richland, WA 99354		Purged By: Nguyen	

Casing Diameter: 2" <u>x</u> 4" _____ 6" _____ Other _____
Initial Depth to Water (feet): 90.92
Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 102.5
Date Purged: 6/25
Top of Screen (feet): 87.5
Purge Time (from/to): 1457 - 1545
Reference Point (surveyor's notch, etc.): TOC
Time Sampled: 1533

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	90.92					7.78		
1500	90.18	8.23	874	19.2	-115.5	6.90	1.29	36A
1505	90.17	7.98	861	20.1	-112.2	7.36	2.36	
1510	"	8.06	885	23.1	-107.0	7.39	3.41	
1515	"	7.86	902	24.2	-100.4	7.07	1.55	
1520	90.18	7.81	909	24.5	-90.8	6.90	1.19	
1525	"	7.78	929	24.6	-88.9	6.93	1.01	
1530	"	7.80	934	24.4	-87.4	6.96	0.97	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 450 mL/min	Sampling Flow Rate: _____
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: _____
Energy Northwest (nitrate)	
Shipment Method: _____	Field QC Sample Number: _____

Well Integrity:
Remarks:
Signature: 

Groundwater Sampling Field Data Sheet

Well #: **MW-09**

Project Number: 555-3820-004		Date: 6/25/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: Ngonjen	
Richland, WA 99354		Purged By: Ngonjen	

Casing Diameter: 2" <u>X</u> 4" <u>-</u> 6" <u>-</u> Other <u>-</u>

Initial Depth to Water (feet): 104.19	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 115.5	Date Purged: 6/25
Top of Screen (feet): 100.5	Purge Time (from/to): 1149 - 1244
Reference Point (surveyor's notch, etc.): TOC	Time Sampled: 1230

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	104.19							
1150	104.22	7.66	1076	19.0	-110.0	3.29	5.62	38A
1155	"	7.49	1074	19.0	-102.8	3.15	3.24	
1200	104.21	7.43	1062	20.6	-102.0	2.74	1.37	
1205	"	7.35	1058	22.7	-100.7	2.60	0.33	
1210	"	7.34	1056	23.8	-103.9	2.44	0.40	
1215	"	7.29	1056	24.1	-127.3	2.38	0.00	
1220	"	7.20	1053	24.4	-131.5	2.39	0.64	
1225	"	7.18	1056	24.5	-140.1	2.34	0.00	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 500 mL/min	Sampling Flow Rate:

Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab:
Energy Northwest (nitrate)	
Shipment Method:	Field QC Sample Number:

Well Integrity:
Remarks:

Signature: 
--

TIME	DTW	pH	Ec	Temp	Redox	DO	Turb
1230	104.21	7.21	1051	24.5	-136.9	2.36	0.93

Groundwater Sampling Field Data Sheet

Well #: **MW-10**

Project Number: 555-3820-004		Date: 6/25/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: <i>[Signature]</i>	
Richland, WA 99354		Purged By: <i>[Signature]</i>	

Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐
--

Initial Depth to Water (feet): 76.55	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 87.5	Date Purged: 6/25
Top of Screen (feet): 72.5	Purge Time (from/to): 1006 - 1045
Reference Point (surveyor's notch, etc.): TOC	Time Sampled: 1030

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	76.55							
1010	76.61	6.91	1860	21.8	-150.0	0.49	2.50	3.6A
1015	"	6.95	1902	22.5	-145.8	0.31	1.52	
1020	76.62	6.91	1911	24.1	-138.2	0.30	4.24	
1025	"	6.99	1916	25.16	-128.2	0.24	1.22	
1030	"	6.89	1925	27.2	-127.9	0.21	1.31	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 500 ml/min	Sampling Flow Rate:

Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab:
Energy Northwest (nitrate)	
Shipment Method:	Field QC Sample Number:

Well Integrity:
Remarks:
Signature: <i>[Signature]</i>

Groundwater Sampling Field Data Sheet

Well #: **MW-11**

Project Number: 555-3820-004		Date: 6/25/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Sampled By: <i>Nogman</i> Purged By: <i>Nogman</i>	
Casing Diameter: 2" <u>X</u> 4" <u> </u> 6" <u> </u> Other <u> </u>			
Initial Depth to Water (feet): 93.80		Purge Flow Rate Measurement Method: Graduated Cylinder	
Depth of Well (feet): 105		Date Purged: 6/25	
Top of Screen (feet): 90		Purge Time (from/to): 1329 - 1425	
Reference Point (surveyor's notch, etc.): TDC		Time Sampled: 1400	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	93.80							
1330	93.91	7.78	1760	19.9	-129.9	7.91	10.43	3.7A
1335	"	7.77	1752	19.6	-133.9	7.10	12.7	
1340	93.94	7.87	1751	20.9	-135.1	6.39	17.9	
1345	"	7.81	1757	24.8	-131.9	6.96	12.1	
1350	93.91	7.76	1752	23.6	-118.6	6.97	6.17	
1355	"	7.83	1740	23.7	-107.0	7.02	5.02	
1400	"	7.81	1734	24.1	-102.7	6.81	2.89	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 325 mL/min	Sampling Flow Rate: <u> </u>
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: <u> </u>
Energy Northwest (nitrate)	
Shipment Method: <u> </u>	Field QC Sample Number: <u> </u>
Well Integrity: <u> </u>	
Remarks:	
Signature: <i>[Signature]</i>	

Groundwater Sampling Field Data Sheet

Well #: **MW-12**

Project Number: 555-3820-004		Date: 6/26/24	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Rod Richland, WA 99354		Sampled By: <i>N. Jensen</i> Purged By: <i>N. Jensen</i>	
Casing Diameter: 2" <u>x</u> 4" <u> </u> 6" <u> </u> Other <u> </u>			
Initial Depth to Water (feet): 91.48		Purge Flow Rate Measurement Method: Graduated Cylinder	
Depth of Well (feet): 104		Date Purged: 6/24	
Top of Screen (feet): 89		Purge Time (from/to): 833 - 910	
Reference Point (surveyor's notch, etc.): TOC		Time Sampled: 855	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	91.48							
835	91.48	8.52	429.9	18.6	-61.1	8.25	6.78	3.8A
840	91.55	8.75	423.4	18.6	-63.4	7.60	9.57	3.9A
845	91.60	7.73	429.3	22.5	-60.0	7.42	8.30	
850	91.61	7.69	423.7	24.3	-58.5	7.04	7.03	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 450 ml/min	Sampling Flow Rate: <u> </u>
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: <u> </u>
Energy Northwest (nitrate)	
Shipment Method: <u> </u>	Field QC Sample Number: <u> </u>
Well Integrity:	
Remarks: Flow fluctuated. Re calibrated pH after first reading.	
Signature: <i>[Signature]</i>	

Field Data Sheet

Well #: Leachate Pond

Project Number:	<u>555-3820-004</u>	Date:	<u>6/26/25</u>
Project Name:	<u>Horn Rapids Landfill</u>	Client Name:	<u>City of Richland</u>
Project Address:	<u>3102 Twin Bridges Road</u>	Measured By:	<u>Nguyen</u>
	<u>Richland, WA 99354</u>		

TIME (2400 hr)	Depth to Water from top of Pipe (ft)	Estimated Depth of Water in Pond (ft)
<u>1055</u>	<u>N/A</u>	<u>7.5</u>

Remarks:

Top 404 ft, bottom 396 ft; approximate length of pipe 25 ft (3:1)

No reading in pipe.

Traci noted when pumping, not much fluid is present (empty after ~2-3 minutes of pumping at very low flow)

Signature: 

Field Data Sheet

Well #: **Condensate Pond**

Project Number: 555-3820-004	Date: 6/26/25
Project Name: Horn Rapids Landfill	Client Name: City of Richland
Project Address: 3102 Twin Bridges Road Richland, WA 99354	Measured By: 

TIME (2400 hr)	Depth to Water from top of Pipe (ft)	Estimated Depth of Water in Pond (ft)
1106	21.90	1

Remarks:
Top 456 ft, bottom 448 ft; approximate length of pipe 25 ft (3:1)

Signature: 

Groundwater Sampling Field Data Sheet

Well #: **MW-01**

Project Number: 555-3820-004		Date: 9/16/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: C. Bourgeois	
Richland, WA 99354		Purged By: " "	

Casing Diameter:	2" <u>x</u>	4" <u>-</u>	6" <u>-</u>	Other <u>-</u>
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Initial Depth to Water (feet): 162.39 @ 857 9/17/25	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 139	Date Purged: 9/16/25
Top of Screen (feet): 114	Purge Time (from/to): 1649-1720
Reference Point (surveyor's notch, etc.): 70c	Time Sampled: 1725

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	*							
1650		8.53	682	18.4	48.6	10.22	clear	217
1655		7.78	698	18.9	40.8	8.48	" "	" "
1700		7.31	708	21.1	46.0	8.17		
1705		7.19	712	21.8	41.0	8.07		
1710		7.10	714	22.0	43.6	7.81		
1715		7.06	716	22.1	43.1	7.49		
1720	✓	7.02	717	22.3	42.8	7.37	✓	✓

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 440 mL/min	Sampling Flow Rate: 440 mL/min

Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 9/17/25
Energy Northwest (nitrate)	NO3 9/17/25
Shipment Method: in-person	Field QC Sample Number:

Well Integrity: § Pump functions well but the well head/mount
Remarks: still a bit cluttered
* WL meter not functioning at time of sampling (9/16/25)
A measurement was collected 9/17/25

Signature: <u>C. Bourgeois</u>

Groundwater Sampling Field Data Sheet

Well #: **MW-02**

Project Number: 555-3820-004		Date: 9/15/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: C. Bourgeois	
Richland, WA 99354		Purged By: <u> </u>	

Casing Diameter: 2" <u>x</u>	4" <u> </u>	6" <u> </u>	Other <u> </u>
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Initial Depth to Water (feet): 83.71	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 123	Date Purged: 9/15/25
Top of Screen (feet): 98	Purge Time (from/to): 943-1010
Reference Point (surveyor's notch, etc.): AT PTL	Time Sampled: 1015

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	(Hz) PUMP SETTING
Initial	83.71							
945	83.72	8.68	637	17.7	121.2	10.69	0.30	198
950	83.71	8.05	636	18.9	171.1	9.90	0.65	198
955	83.71	7.69	638	20.9	119.2	9.62	0.35	" "
1000	83.71	7.59	639	21.7	117.4	9.60	0.36	" "
1005	83.71	7.57	637	21.7	115.6	9.43	0.14	" "
1010	83.71	7.52	633	21.7	113.0	9.28	0.08	" "

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 500 ml/min	Sampling Flow Rate: 500
Field Parameter Instrument	

Laboratory: ARI	Date Sent to Lab: 9/17/25
Energy Northwest (nitrate)	2400 1003 9/16/25
Shipment Method: in-person	Field QC Sample Number: <u> </u>

Well Integrity: Needed shovel to access well gate.
Remarks: WL measurement very good. 205 Hz to initiate flow. Samples @ 1015
Signature: <u>C. Bourgeois</u>

Groundwater Sampling Field Data Sheet

Well #: **MW-03**

Project Number: 555-3820-004		Date: 9/15/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Sampled By: C. Bourgeois Purged By: " "	

Casing Diameter: 2" <u>x</u> 4" <u>-</u> 6" <u>-</u> Other <u>-</u>	
Initial Depth to Water (feet): 95.25	Purge Flow Rate: Graduated Cylinder
Depth of Well (feet): 136	Measurement Method: 9/15/25
Top of Screen (feet): 111	Date Purged: 9/15/25
Reference Point (surveyor's notch, etc.): <u>well cap</u>	Purge Time (from/to): 1058 - 1140
	Time Sampled: 1145

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec μ S/cm (25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	95.25							
1100	95.25	8.32	471.6	18.5	87.1	11.61	0.00	210
1105	95.25	8.12	469.0	18.6	85.8	11.11	0.00	" "
1110	95.25	7.86	476.5	19.4	88.6	10.89	↓	" "
1115	95.30	7.78	478.0	21.0	95.7	10.46		" "
1120	95.29	7.58	460.2	22.0	97.3	10.29		" "
1125	95.29	7.77	480.1	22.4	96.4	10.00		" "
1130	95.28	7.37	462.6	22.7	96.2	9.55		" "
1135	95.28	7.32	460.3	22.9	93.6	10.25	↓	" "

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 275 mL/min	Sampling Flow Rate: 275 mL/min
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 9/17/25
Energy Northwest (nitrate)	N03 9/16/25
Shipment Method: in-person	Field QC Sample Number: _____

Well Integrity:
Remarks: <ul style="list-style-type: none"> - 280 ft² to initiate flow - Good WL measurement. - water is very clear but 0.00 unlikely?
Signature: <u>Ch...</u>

* Top part of YSL dropping... DO readings may be artificially high.

Final, in order: 1140, 95.28, 7.31, 468.6, 23.0, 92.1, 0.00, "

Groundwater Sampling Field Data Sheet

Well #: **MW-04**

Project Number: 555-3820-004		Date: 9/15/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: C. Bourgeois	
Richland, WA 99354		Purged By: " "	

Casing Diameter: 2" <u>x</u> 4" <u>-</u> 6" <u>-</u> Other <u>-</u>

Initial Depth to Water (feet): 76.54	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 115	Date Purged: 9/15/25
Top of Screen (feet): 90	Purge Time (from/to): 1228 - 1305
Reference Point (surveyor's notch, etc.): well cap	Time Sampled: 1310

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	76.54							
1230	76.55	8.43	658	19.1	82.7	7.67	clear	182
1235	76.56	8.09	665	19.2	80.2	6.86	" "	" "
1240	76.56	7.74	669	21.3	82.0	6.23	" "	" "
1245	76.56	7.67	678	21.5	83.5	6.19	" "	" "
1250	76.56	7.62	677	21.8	83.8	5.91	" "	" "
1255	76.56	7.50	675	21.8	84.2	5.95	" "	" "
1300	76.56	7.44	673	21.9	84.9	5.91	" "	" "
1305	76.56	7.40	672	21.9	85.0	5.74	" "	" "

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 500 mL/min	Sampling Flow Rate: 500 mL/min

Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 9/17/25
Energy Northwest (nitrate)	NO3 9/16/25
Shipment Method:	Field QC Sample Number: MW-21; and MS/MSD

Well Integrity:
Remarks: Dup MW-21 collected @ 1340 - Good WL measurement

Signature: <u>ChVB</u>

* Top part of YSI dripping

Groundwater Sampling Field Data Sheet

Well #: **MW-05**

Project Number: 555-3820-004		Date: 9/16/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: C. Bourgeois	
Richland, WA 99354		Purged By: " "	

Casing Diameter:	2" <u>x</u>	4" <u> </u>	6" <u> </u>	Other <u> </u>
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Initial Depth to Water (feet): 83.46	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 101	Date Purged: 9/16/25
Top of Screen (feet): 91	Purge Time (from/to): 1129
Reference Point (surveyor's notch, etc.): Well cap	Time Sampled: 1200

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	83.46							
1130	83.54	6.72	1420	21.5	-59.5	1.22	clear	211
1135	*	6.31	1810	22.1	-1.2	0.68	" "	" "
1140	↓	6.08	1826	24.2	16.7	0.57	↓	↓
1145	↓	6.05	1810	24.7	16.4	0.46	↓	↓
1150	↓	6.10	1789	24.7	17.2	0.47	↓	↓
1155	↓	6.02	1768	25.0	19.6	0.41	↓	↓

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 500 ml/min	Sampling Flow Rate: 500 ml/min
Field Parameter Instrument	

Laboratory: ARI	Date Sent to Lab: 9/17/25
Energy Northwest (nitrate)	NO3 9/17/25
Shipment Method: in person	Field QC Sample Number: —

Well Integrity:
Remarks: - WL meter compromised after 1130 measurement * First WL measurements were good.
Signature: CURB

Groundwater Sampling Field Data Sheet

Well #: **MW-06**

Project Number: 555-3820-004		Date: 9/16/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Sampled By: C. Bourgeois Purged By: "	

Casing Diameter: 2" <u>x</u> 4" <u>-</u> 6" <u>-</u> Other <u>-</u>

Initial Depth to Water (feet): 98.01 ²⁹¹⁰ _{9/17/25}	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 116	Date Purged: 9/16/25
Top of Screen (feet): 106	Purge Time (from/to): 1239 - 1315
Reference Point (surveyor's notch, etc.): Well cap	Time Sampled: 1320

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	*							
1240	↓	6.75	3189	21.8	-31.6	1.04	clear	221
1245	↓	6.33	3225	21.9	17.3	0.44	" "	" "
1250	↓	6.13	3141	23.7	28.9	0.35	↓	↓
1255	↓	5.96	3016	25.3	36.0	0.30	↓	↓
1300	↓	5.92	2909	25.9	35.8	0.28	↓	↓
1305	↓	5.92	2844	26.0	34.8	0.22	↓	↓
1310	↓	5.91	2761	26.3	33.7	0.27	↓	↓
1315	↓	5.90	2751	26.4	33.6	0.26	↓	↓

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 500 mL/min	Sampling Flow Rate: 500 mL/min

Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 9/17/25
Energy Northwest (nitrate)	103 9/17/25
Shipment Method: in-person	Field QC Sample Number: ~

Well Integrity:

Remarks:

- 240 #2 to initiate flow

* WL meter inoperative at time of sampling.

WL measurement 9/17/25

Signature:

Groundwater Sampling Field Data Sheet

Well #: **MW-08**

Project Number: 555-3820-004		Date: 9/15/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Sampled By: C. Bourgeois Purged By: "	
Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐			
Initial Depth to Water (feet): 90.20		Purge Flow Rate Measurement Method: Graduated Cylinder	
Depth of Well (feet): 102.5		Date Purged: 9/15/25	
Top of Screen (feet): 87.5		Purge Time (from/to): 1425 - 1456	
Reference Point (surveyor's notch, etc.): well cap		Time Sampled: 1500	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	90.20				74.1			
1425	90.21	9.40	711	19.3	74.1	10.85	clear	206
1430	90.23	8.84	720	19.0	64.4	9.98	" "	" "
1435	90.23	8.33	716	21.0	66.1	9.60	" "	" "
1440	90.23	7.91	719	23.4	69.6	9.32	" "	" "
1445	90.23	7.79	716	23.9	72.1	8.94	" "	" "
1450	90.23	7.77	713	24.1	70.0	8.80	" "	" "
1455	90.23	7.71	714	24.5	69.9	8.83	" "	" "

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 310 mL/min	Sampling Flow Rate: 310 mL/min
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 9/17/25
Energy Northwest (nitrate)	NO3 9/16/25
Shipment Method: in-person	Field QC Sample Number: —

Well Integrity: Discharge tubing at well cap not perfectly sealed.
Remarks: Good WL measurements. ~240 l/s needed to initiate flow Samples @ 1500
Signature: <i>Ch VS</i>

Groundwater Sampling Field Data Sheet

Well #: **MW-09**

Project Number: 555-3820-004		Date: 9/15/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: C. Burgcois	
Richland, WA 99354		Purged By: "	

Casing Diameter: 2" <u>x</u> 4" <u>-</u> 6" <u>-</u> Other <u>-</u>

Initial Depth to Water (feet): 104.30 ⁹¹⁹ _{9/17/25}	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 115.5	Date Purged: 1608 9/15/25
Top of Screen (feet): 100.5	Purge Time (from/to): 1608 - 1635
Reference Point (surveyor's notch, etc.): well cap	Time Sampled: 1640

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	X							
1615	↓	8.61	1065	19.5	29.6	4.25	clear	227
1615	↓	7.76	1055	20.1	39.9	3.92	" "	" "
1620	↓	7.13	1056	22.1	44.9	3.71	" "	" "
1625	↓	6.67	1055	23.8	52.2	3.37	↓	↓
1630	↓	6.56	1051	24.0	53.9	3.40	↓	↓
1635	↓	6.57	1047	24.1	54.3	3.23	↓	↓

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 550 mL/min	Sampling Flow Rate: 550 mL/min

Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 9/17/25
Energy Northwest (nitrate)	103- 9/16/25
Shipment Method: in person	Field QC Sample Number: _____

Well Integrity:
Remarks: * WL meter broke prior to beginning purge. Samples @ 1640
Signature: <u>C. Burgcois</u>

Groundwater Sampling Field Data Sheet

Well #: **MW-10**

Project Number: 555-3820-004		Date: 9/16/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: C. Bourgeois	
Richland, WA 99354		Purged By: "	

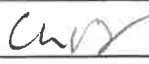
Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐
--

Initial Depth to Water (feet): 76.73	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 87.5	Date Purged: 9/16/25
Top of Screen (feet): 72.5	Purge Time (from/to): 1016 - 1040
Reference Point (surveyor's notch, etc.):	Time Sampled: 1045H

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec $\mu\text{mhos/cm}$ 25°C (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	76.73							
1020	76.78	6.38	1952	21.4	-68.7	0.50	clear	196
1025	76.75	6.11	1948	23.5	-57.0	0.38	" "	" "
1030	76.75	5.90	1925	25.4	-53.0	0.38	↓	↓
1035	76.75	5.87	1997	26.0	-53.4	0.32	↓	↓
1040	76.75	5.85	2015	26.1	-50.4	0.33	↓	↓

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 500 mL/min	Sampling Flow Rate: 500 mL/min

Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 9/17/25
Energy Northwest (nitrate)	W03 9/17/25
Shipment Method: in person	Field QC Sample Number:

Well Integrity:
Remarks: - Good WL measurements. Sampled @ 1045
Signature: 

Groundwater Sampling Field Data Sheet

Well #: **MW-11**

Project Number: 555-3820-004		Date: 9/16/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Sampled By: C. Bourgeois Purged By: " "	

Casing Diameter: 2" <u>x</u> 4" <u>-</u> 6" <u>-</u> Other <u>-</u>

Initial Depth to Water (feet): 93.82 ^{± 928} 9/17/25	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 105	Date Purged: 9/16/25
Top of Screen (feet): 90	Purge Time (from/to): 1529 - 1550
Reference Point (surveyor's notch, etc.): well cap	Time Sampled: 1555

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	*							
1530	↓	7.96	1889	18.0	56.7	5.7	clear	210
1535	↓	7.22	1879	21.8	55.2	12.08	" "	" "
1540	↓	7.08	1885	22.6	57.3	11.77	↓	↓
1545	↓	7.02	1879	23.0	58.1	11.35	↓	↓
1550	↓	6.99	1888	23.5	55.7	11.28	↓	↓

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 740 mL/min	Sampling Flow Rate: 740 mL/min
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 9/17/25
Energy Northwest (nitrate)	NO3- 9/17/25
Shipment Method: in person	Field QC Sample Number: —

Well Integrity:
Remarks: * WL meter inoperable at time of sampling WL measurement 9/17/25
Signature: <u>Chris</u>

Groundwater Sampling Field Data Sheet

Well #: **MW-12**

Project Number: 555-3820-004		Date: 9/16/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Rod Richland, WA 99354		Sampled By: C. Bourgeois Purged By: ~ ~	
Casing Diameter: 2" <u>x</u> 4" <u>_</u> 6" <u>_</u> Other <u>_</u>			
Initial Depth to Water (feet): *		Purge Flow Rate Measurement Method: Graduated Cylinder	
Depth of Well (feet): 104		Date Purged: 1416 9/16/25	
Top of Screen (feet): 89		Purge Time (from/to): 1416-1445	
Reference Point (surveyor's notch, etc.): <u> </u>		Time Sampled: 1450	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	*							
1426	↓	8.14	516	18.9	26.8	7.96	clear	212
1425	↓	7.87	515	26.0	25.7	7.79	" "	" "
1430	↓	7.52	512	23.2	33.4	7.72	↓	↓
1435	↓	7.39	506	24.9	43.1	7.70	↓	↓
1440	↓	7.41	501	24.2	44.7	7.77	↓	↓
1445	↓	7.36	495	25.2	45.9	7.57	↓	↓

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 500 mL/min	Sampling Flow Rate: 500 mL/min
Field Parameter Instrument: (varied)	(varied)
Laboratory: ARI	Date Sent to Lab: 9/17/25
Energy Northwest (nitrate)	203- 9/17/25
Shipment Method: in person	Field QC Sample Number: <u> </u>

Well Integrity:

Remarks: Pump keeps losing flow without shutting off. I increase the to regain ~300-500 mL/min, then minutes later flow significantly increases. I reduce to ~212, then minutes later flow slow down reoccurs.

Signature: CHURV * V/L meter inoperable at time of sampling

- Also, ~~but~~ pump fluctuations having noticeable effect on D.O. Waited for D.O. to stabilize before recording. Page 1 of 1

Field Data Sheet

Well #: Leachate Pond

Project Number:	<u>555-3820-004</u>	Date:	<u>9/16/25</u>
Project Name:	<u>Horn Rapids Landfill</u>	Client Name:	<u>City of Richland</u>
Project Address:	<u>3102 Twin Bridges Road</u>	Measured By:	<u>C. Bourgeois</u>
	<u>Richland, WA 99354</u>		
TIME (2400 hr) <u>936</u>	Depth to Water from top of Pipe (ft) <u>20.56'</u>	Estimated Depth of Water in Pond (ft) <u>6.4'</u>	
Remarks: <i>Top 404 ft, bottom 396 ft; approximate length of pipe 25 ft (3:1)</i>			
Signature: <u></u>			

Groundwater Sampling Field Data Sheet

Well #: Leachate Port

Project Number:	<u>555-3820-004</u>	Date:	<u>9/16/25</u>
Project Name:	<u>Horn Rapids Landfill</u>	Client Name:	<u>City of Richland</u>
Project Address:	<u>3102 Twin Bridges Road</u> <u>Richland, WA 99354</u>	Sampled By:	<u>Tracy Reed</u> <u>C. Bourgeois</u>

TIME (2400 hr)	pH (units)	Ec (µmhos/cm 25°C)	TEMPERATURE °C	Redox (mv)	Dissolved Oxygen (mg/L)	TURBIDITY (visual)
<u>~900</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Laboratory:	<u>Analytical Resources, Inc.</u>	Date Sent to Lab:	<u> </u>
Chain-of-Custody (yes/no):	<u>yes</u>	Field QC Sample Number:	<u>None</u>
Shipment Method:	<u> </u>		<u>None</u>

Remarks:

Depth level FeetAll 4 dry.Signature: 

Field Data Sheet

Well #: Condensate PondProject Number: 555-3820-004Date: 9/16/25Project Name: Horn Rapids LandfillClient Name: City of RichlandProject Address: 3102 Twin Bridges RoadMeasured By: C. BourgeoisRichland, WA 99354TIME
(2400 hr)915Depth to Water from top of Pipe
(ft)21.72

Estimated Depth of Water in Pond (ft)

0.0

Remarks:

Top 456 ft, bottom 448 ft; approximate length of pipe 25 ft (3:1)

*Small amount of water
at end of the pond.
Pond completely dry at
gauge*

Signature: _____

Groundwater Sampling Field Data Sheet

Well #: **MW-01**

Project Number: 555-3820-004		Date: 12/8/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: <i>N. Nguyen</i>	
Richland, WA 99354		Purged By: <i>N. Nguyen</i>	
Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐			
Initial Depth to Water (feet): * 102.10'		Purge Flow Rate Measurement Method: Graduated Cylinder	
Depth of Well (feet): 139		Date Purged: 12/8	
Top of Screen (feet): 114		Purge Time (from/to): 1511 - 1600	
Reference Point (surveyor's notch, etc.):		Time Sampled: 1540	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	102.10'							
1515	—	7.55	821	16.9	169.6	9.06	1.60	3.6A
1520		7.38	818	17.7	165.7	9.03	1.17	
1525		7.25	822	19.0	165.3	8.52	1.02	
1530		7.15	826	20.3	164.8	8.31	1.06	
1535		7.09	822	20.7	166.5	8.25	1.20	
1540		7.06	825	20.9	167.2	8.05	0.99	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 350 mL/min	Sampling Flow Rate:
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab:
Energy Northwest (nitrate)	
Shipment Method:	Field QC Sample Number:

Well Integrity:
Remarks: Couldn't get WL reading before purging. Meter would get stuck on tubing? pump? Bubbles in purge water, but used new bucket that may have had residual soap. *WL measured 12/10 to be 102.10 ft
Signature: <i>[Signature]</i>

Groundwater Sampling Field Data Sheet

Well #: **MW-02**

Project Number: 555-3820-004		Date: 12/9/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Sampled By: <i>nguyen</i> Purged By: <i>nguyen</i>	
Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐			
Initial Depth to Water (feet): 83.54'		Purge Flow Rate Measurement Method: Graduated Cylinder	
Depth of Well (feet): 123		Date Purged: 12/9	
Top of Screen (feet): 98		Purge Time (from/to): 1428 - 1520	
Reference Point (surveyor's notch, etc.):		Time Sampled: 1500 <i>checked</i>	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	83.54							
1430	83.58	7.14	617	15.8	182.0	11.07	0.03	3.6A
1435	"	6.91 6.92	618	16.9	178.6	9.69	1.17	
1440	"	6.84	620	20.3	176.3	8.86	1.25	
1445	"	6.81	602	20.4	173.4	8.83	0.69	
1450	"	6.79	597	20.6	173.7	8.50	0.22	
1455	"	6.77	592	20.6	174.6	8.47	0.59	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 500 mL/min	Sampling Flow Rate:
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 12/10
Energy Northwest (nitrate)	
Shipment Method:	Field QC Sample Number:

Well Integrity:
Remarks:
Signature: <i>[Signature]</i>

Groundwater Sampling Field Data Sheet

Well #: **MW-03**

Project Number: <u>555-3820-004</u>		Date: <u>12/9/25</u>	
Project Name: <u>Horn Rapids Landfill</u>		Client Name: <u>City of Richland</u>	
Project Address: <u>3102 Twin Bridges Road</u> <u>Richland, WA 99354</u>		Sampled By: <u>nguyen</u> <u>nguyen</u>	
Casing Diameter: <u>2" x</u> <u>4" _</u> <u>6" _</u> Other <u>_____</u>			
Initial Depth to Water (feet): <u>96.00</u>		Purge Flow Rate Measurement Method: <u>Graduated Cylinder</u>	
Depth of Well (feet): <u>136</u>		Date Purged: <u>12/9</u>	
Top of Screen (feet): <u>111</u>		Purge Time (from/to): <u>1347 - 1420</u>	
Reference Point (surveyor's notch, etc.): <u>_____</u>		Time Sampled: <u>1400</u>	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
<u>Initial</u>	<u>96.00</u>							
<u>1350</u>	<u>-</u>	<u>7.01</u>	<u>503</u>	<u>15.9</u>	<u>167.1</u>	<u>11.39</u>	<u>0.50</u>	<u>3.7A</u>
<u>1355</u>	<u>-</u>	<u>7.03</u>	<u>510</u>	<u>15.9</u>	<u>163.0</u>	<u>11.27</u>	<u>0.00</u>	<u>_____</u>
<u>1400</u>	<u>-</u>	<u>7.03</u>	<u>514</u>	<u>16.1</u>	<u>160.5</u>	<u>11.21</u>	<u>0.23</u>	<u>_____</u>

Purge Equipment: <u>Dedicated Submersible</u>	Sampling Equipment: <u>Dedicated Submersible</u>
Purge Flow Rate: <u>400 mL/min</u>	Sampling Flow Rate: <u>_____</u>
Field Parameter Instrument	
Laboratory: <u>ARI</u>	Date Sent to Lab: <u>12/10</u>
<u>Energy Northwest (nitrate)</u>	
Shipment Method: <u>_____</u>	Field QC Sample Number: <u>_____</u>

Well Integrity:
Remarks: <u>couldn't read WL while purging.</u>
Signature: <u>[Signature]</u>

Groundwater Sampling Field Data Sheet

Well #: **MW-04**

Project Number: 555-3820-004		Date: 12/9/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Sampled By: <i>Nguyen</i> Purged By: <i>Nguyen</i>	
Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐			
Initial Depth to Water (feet): 75.66		Purge Flow Rate Measurement Method: Graduated Cylinder	
Depth of Well (feet): 115		Date Purged: 12/9	
Top of Screen (feet): 90		Purge Time (from/to): 1303 - 1335	
Reference Point (surveyor's notch, etc.):		Time Sampled: 1320	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	75.66							
1305	76.23	6.85	672	17.0	168.8	6.44	0.14	3.5A
1310	—	6.87	692	18.0	163.0	6.56	0.00	—
1315	—	6.91	678	19.3	158.3	6.24	0.29	—
1320	—	6.90	680	19.5	153.1	6.39	0.23	—

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 400 mL/min	Sampling Flow Rate: —
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 12/10
Energy Northwest (nitrate)	
Shipment Method: hand	Field QC Sample Number: —

Well Integrity:
Remarks: Difficult to read WL during purging.
Signature: <i>[Signature]</i>

Groundwater Sampling Field Data Sheet

Well #: **MW-05**

Project Number: 555-3820-004		Date: 12/8/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Sampled By: <i>Noggen</i> Purged By: <i>Noggen</i>	

Casing Diameter: 2" <u>x</u> 4" <u> </u> 6" <u> </u> Other <u> </u>	
Initial Depth to Water (feet): 83.10'	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 101	Date Purged: 12/8
Top of Screen (feet): 91	Purge Time (from/to): 1234 - 1345
Reference Point (surveyor's notch, etc.):	Time Sampled: 1320

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	83.10							
1235	*	6.90	1430	18.8	76.8	2.07	2.31	3.6A
1240		6.81	1979	19.0	119.1	1.17	2.09	
1245		6.74	2177	19.2	136.9	1.01	1.21	
1250		6.73	2184	19.5	146.5	1.03	1.32	
1255		6.60	2130	21.0	151.7	0.95	0.57	
1300		6.50	2099	22.5	152.3	0.81	1.34	
1305		6.45	2087	23.5	152.4	0.74	0.88	
1310		6.42	2084	23.9	152.9	0.69	0.30	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 300 mL/min	Sampling Flow Rate:
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 12/10
Energy Northwest (nitrate)	
Shipment Method: hand	Field QC Sample Number: MW-21 (e "1100")

Well Integrity:

Remarks: sulfur odor during initial purging
 * difficult to take WL during purging

Signature: *[Signature]*

1315 6.40 2071 24.6 152.8 0.66 0.53

Well #: **MW-06**Page 1 of 1

Groundwater Sampling Field Data Sheet

Well #: **MW-08**

Project Number: 555-3820-004		Date: 12/9/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: Nguyen	
Richland, WA 99354		Purged By: Nguyen	

Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐
--

Initial Depth to Water (feet): 89.89	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 102.5	Date Purged:
Top of Screen (feet): 87.5	Purge Time (from/to): 1202-1240
Reference Point (surveyor's notch, etc.):	Time Sampled: 1230

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	89.89							
1205	89.92	6.95	641	17.1	165.3	8.09	0.22	3.6A
1210	—	6.90	643	18.5	163.1	7.82	0.27	
1215	—	6.78	654	21.5	164.4	7.20	0.29	
1220	—	6.76	655	22.1	163.8	7.11	0.55	
1225	—	6.76	653	22.5	163.1	7.03	0.64	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 450 ml/min	Sampling Flow Rate:

Field Parameter Instrument

Laboratory: ARI	Date Sent to Lab: 12/10
Energy Northwest (nitrate)	
Shipment Method: hand	Field QC Sample Number: —

Well Integrity:

Remarks: Difficult to read WL while purging.

Signature: 

Groundwater Sampling Field Data Sheet

Well #: **MW-09**

Project Number: 555-3820-004		Date: 12/9/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: Nguyen	
Richland, WA 99354		Purged By: Nguyen	

Casing Diameter: 2" <u>x</u> 4" <u> </u> 6" <u> </u> Other <u> </u>
--

Initial Depth to Water (feet): 104.01	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 115.5	Date Purged: <u> </u>
Top of Screen (feet): 100.5	Purge Time (from/to): 1105 ~ 1140
Reference Point (surveyor's notch, etc.): <u> </u>	Time Sampled: 1125

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	104.01							
1110	—	6.60	1054	18.7	146.5	3.69	2.86	3.8A
1115	104.08	6.48	1058	20.5	146.8	3.24	1.28	
1120	"	6.43	1059	21.0	147.0	3.20	0.83	
1125	"	6.42	1059	21.1	147.1	3.17	0.07	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 500 mL/min	Sampling Flow Rate: <u> </u>
Field Parameter Instrument <u> </u>	

Laboratory: ARI	Date Sent to Lab: 12/10
Energy Northwest (nitrate)	
Shipment Method: <u> </u>	Field QC Sample Number: <u> </u>

Well Integrity: <u> </u>
Remarks: Very difficult to take WL reading
Signature: 

Groundwater Sampling Field Data Sheet

Well #: **MW-10**

Project Number: 555-3820-004		Date: 12/8/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Sampled By: <i>Nagyer</i> Purged By: <i>Nagyer</i>	
Casing Diameter: 2" <u>X</u> 4" <u> </u> 6" <u> </u> Other <u> </u>			
Initial Depth to Water (feet): 76.49		Purge Flow Rate Measurement Method: Graduated Cylinder	
Depth of Well (feet): 87.5		Date Purged: <u> </u>	
Top of Screen (feet): 72.5		Purge Time (from/to): 1134 - 1220	
Reference Point (surveyor's notch, etc.): <u> </u>		Time Sampled: 1200	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	76.49							
1135	76.50	6.45	248.0	19.8	-216.1	0.65	0.24	3.6A
1140	"	6.52	241.1	19.8	-149.0	1.20	0.89	
1145	76.49	6.65	250.9	20.1	+136.5	0.62	0.97	
1150	"	6.66	248.6	20.8	128.7	0.55	1.15	
1155	"	6.65	247.1	21.5	125.2	0.52	1.05	
1200	"	6.61	247.2	22.7	119.0	0.50	1.09	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 250 ml/min	Sampling Flow Rate: <u> </u>
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 12/10
Energy Northwest (nitrate)	
Shipment Method: <u> </u>	Field QC Sample Number: <u> </u>

Well Integrity:
Remarks:
Signature: <i>[Signature]</i>

Groundwater Sampling Field Data Sheet

Well #: **MW-11**

Project Number: 555-3820-004		Date: 12/9/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Road		Sampled By: <i>[Signature]</i>	
Richland, WA 99354		Purged By: <i>[Signature]</i>	

Casing Diameter: 2" <u>x</u> 4" <u>-</u> 6" <u>-</u> Other <u>-</u>

Initial Depth to Water (feet): 93.92'	Purge Flow Rate Measurement Method: Graduated Cylinder
Depth of Well (feet): 105	Date Purged: 12/9
Top of Screen (feet): 90	Purge Time (from/to): 1528 -
Reference Point (surveyor's notch, etc.):	Time Sampled: 1550

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	93.92'							
1530	93.98'	6.65	1961	16.2	191.0	11.51	13.3	3.7A
1535	93.99	6.59	1966	17.2	187.4	10.66	10.6	
1540	-	6.51	1961	20.0	185.6	10.16	6.89	
1545	-	6.47	1960	21.3	185.6	10.90	6.75	
1550	-	6.45	1960	21.6	185.8	10.35	6.05	

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 350 mL/min	Sampling Flow Rate:

Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 12/10
Energy Northwest (nitrate)	
Shipment Method:	Field QC Sample Number:

Well Integrity:
Remarks: WL meter got tangled when retracting.
Signature: <i>[Signature]</i>

Groundwater Sampling Field Data Sheet

Well #: **MW-12**

Project Number: 555-3820-004		Date: 12/9/25	
Project Name: Horn Rapids Landfill		Client Name: City of Richland	
Project Address: 3102 Twin Bridges Rod Richland, WA 99354		Sampled By: <i>Nguyen</i> Purged By: <i>Nguyen</i>	
Casing Diameter: 2" <u>x</u> 4" <u> </u> 6" <u> </u> Other <u> </u>			
Initial Depth to Water (feet): 91.12		Purge Flow Rate Measurement Method: Graduated Cylinder	
Depth of Well (feet): 104		Date Purged: 12/9	
Top of Screen (feet): 89		Purge Time (from/to): 958-1045	
Reference Point (surveyor's notch, etc.): <u> </u>		Time Sampled: 1030	

TIME (2400 hr)	DEPTH TO WATER (ft)	pH (units) (± 0.1)	Ec (µmhos/cm 25°C) (± 3%)	TEMP °C	Redox (mv) (± 10)	Dissolved Oxygen mg/L (± 10%)	TURBIDITY (NTU)	PUMP SETTING
Initial	91.12							
1005	91.24	7.00	586	18.1	203.9	8.01	16.9	4.0A
1010								
1013	91.11	6.89	588	21.2	197.5	8.10	16.5	3.9A
1018	"	6.99	590	22.1	181.5	7.85	19.9	
1023	"	7.02	589	22.0	177.5	7.50	24.8	
1028	"	7.09	596	20.0	168.1	7.22	30.7	

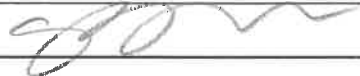
had to
re fill
generator

Purge Equipment: Dedicated Submersible	Sampling Equipment: Dedicated Submersible
Purge Flow Rate: 350 ml/min	Sampling Flow Rate: <u> </u>
Field Parameter Instrument	
Laboratory: ARI	Date Sent to Lab: 12/10
Energy Northwest (nitrate)	
Shipment Method: <u> </u>	Field QC Sample Number: <u> </u>

Well Integrity:
Remarks:
Signature: <i>[Signature]</i>

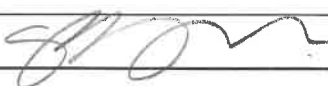
Field Data Sheet

Well #: **Condensate Pond**

Project Number: 555-3820-004		Date: 12/9/25
Project Name: Horn Rapids Landfill		Client Name: City of Richland
Project Address: 3102 Twin Bridges Road Richland, WA 99354		Measured By: 
TIME (2400 hr) 1630	Depth to Water from top of Pipe (ft) 21.80	Estimated Depth of Water in Pond (ft) 1
Remarks: <i>Top 456 ft, bottom 448 ft; approximate length of pipe 25 ft (3:1)</i>		
Signature: 		

Field Data Sheet

Well #: Leachate Pond

Project Number:	<u>555-3820-004</u>	Date:	<u>12/8/25</u>
Project Name:	<u>Horn Rapids Landfill</u>	Client Name:	<u>City of Richland</u>
Project Address:	<u>3102 Twin Bridges Road</u>	Measured By:	<u>Nguyen</u>
	<u>Richland, WA 99354</u>		
TIME (2400 hr) <u>1055</u>	Depth to Water from top of Pipe (ft) <u>14.10'</u>	Estimated Depth of Water in Pond (ft) <u>7.5'</u>	
Remarks: <i>Top 404 ft, bottom 396 ft; approximate length of pipe 25 ft (3:1)</i>			
Signature: <u></u>			