2023 Annual Report

Hidden Valley Landfill
Puyallup, Washington

Pierce County Recycling, Composting
& Disposal, LLC dba LRI
17925 Meridian Street East
Puyallup, Washington 98375

SCS ENGINEERS

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This 2023 Annual Report for the Hidden Valley Landfill located in Puyallup, Washington, was prepared by Jovany Estrada, Alex Deszo and Kevin Lakey, LHG, and was reviewed by Daniel Venchiarutti, LHG, of SCS Engineers.

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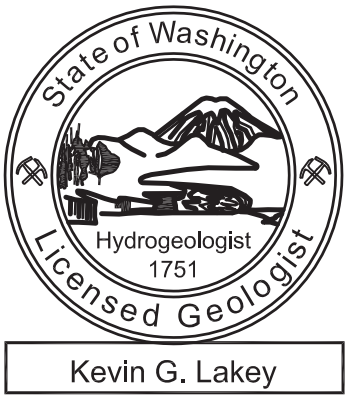

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1.0 INTRODUCTION

This document is the 2023 Annual Monitoring Report for the Hidden Valley Landfill (HVL) prepared on behalf of Pierce County Recycling, Composting and Disposal LLC, dba LRI (LRI). The facility consists of a closed municipal solid waste landfill that stopped accepting waste on December 31, 1998. The Hidden Valley Landfill is located at 17925 Meridian Street East, Puyallup, Washington (Figure 1). Post-closure activities are performed consistent with Consent Decree No. 032146876 between the Washington Department of Ecology (Ecology), Pierce County (County) and LRI. Ecology is the lead agency for post-closure activities. In addition, the Tacoma-Pierce County Health Department (TPCHD) is kept informed of post-closure activities and provided with the opportunity to review and comment upon proposed remedial action plans.

1.1 FACILITY CONTACT INFORMATION

Hidden Valley Landfill
17925 Meridian East
Puyallup, Washington 98375
Facility Contact: Kevin Green (253) 847-7555

1.2 FACILITY DESCRIPTION

The landfill property is approximately 92 acres in size and is situated in the north half of the northwest quarter of Section 34, Township 19N, Range 4E. The landfill includes approximately 56 acres of unlined fill and a 30-acre lined cell. Also present at the site are an office, maintenance shop, leachate pre-treatment facility, transfer station, household hazardous waste collection site, recycling center and composting facility.

The Hidden Valley Landfill began operations in the mid-1960s and accepted waste until December 31, 1998. Waste disposed of at the landfill included municipal solid waste, demolition wastes, commercial waste, industrial wastes, and small quantities of bulk liquids and sludge.

1.3 PROJECT HISTORY

The U.S. Environmental Protection Agency (EPA) conducted an environmental assessment of the Hidden Valley Landfill between 1981 and 1985 and prepared a Preliminary Assessment (PA) and a Hazard Ranking System (HRS) score for the site. As a result of the HRS, the Hidden Valley Landfill was placed on the National Priority List (NPL) in April 1989.

A Remedial Investigation (RI) was conducted under Ecology Consent Order DE 86 S173. The final RI report was submitted to Ecology in March 1992. The RI identified groundwater impacts downgradient of the landfill. Groundwater contaminants have included dissolved iron and manganese, chloride, ammonia, nitrate, sulfate, specific conductance, total dissolved solids, and low levels of volatile organic compounds (VOCs) including benzene, chlorobenzene, tetrachloroethene, 1,1-dichloroethane, and 1,4-dichlorobenzene.

In January 2004, Consent Decree No. 032146876 was finalized and signed. The Consent Decree and associated Cleanup Action Plan address long-term maintenance and monitoring activities at the landfill and establish groundwater cleanup levels.

In April 2014, the Consent Decree was amended (First Amendment) to revise the groundwater monitoring plan. In August 2014, the Groundwater Monitoring Plan (GWMP) was modified to include

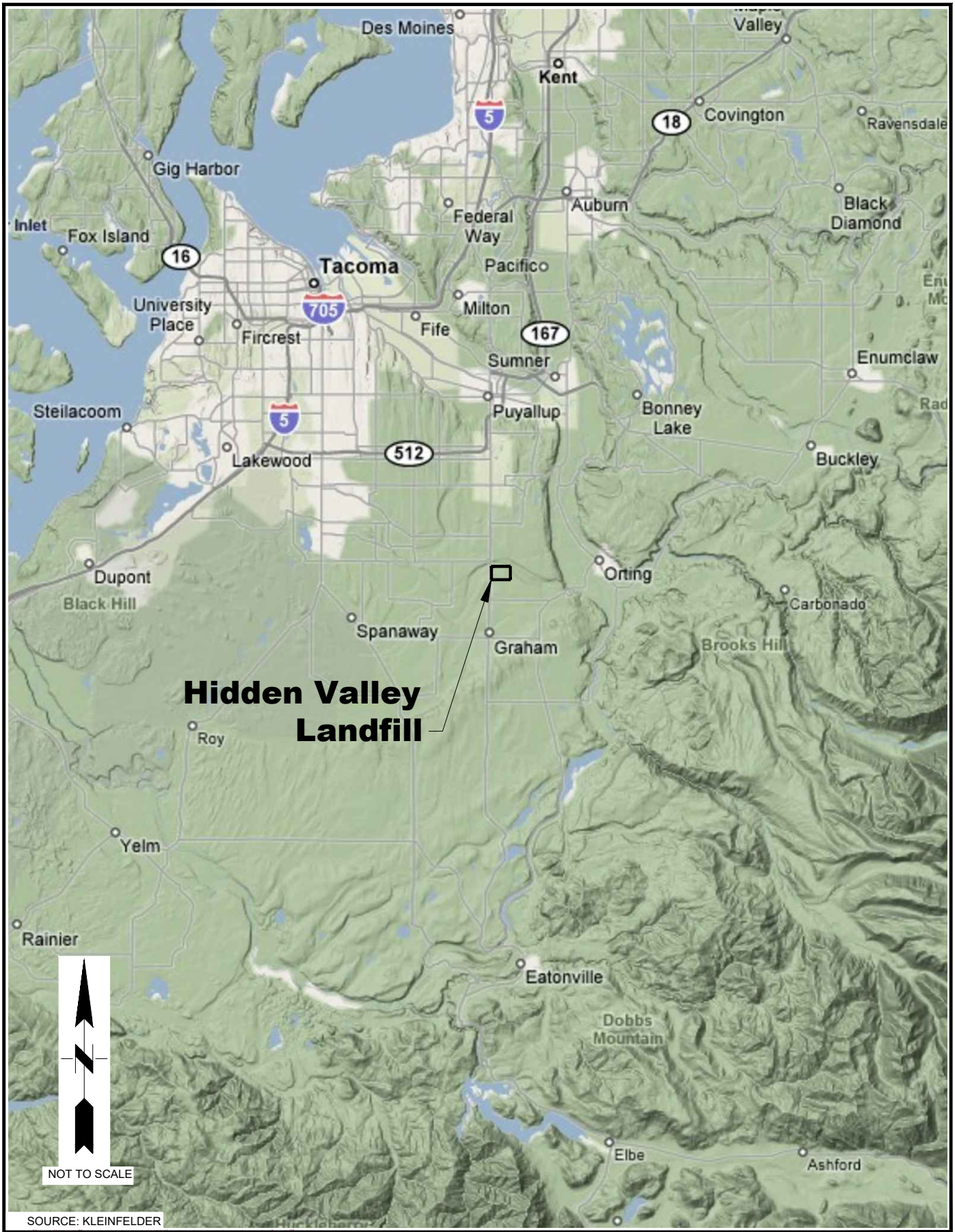
Appendix I WAC 173-351 metals testing. This requirement included eight rounds of total and dissolved metals testing for 15 metals from 23 monitoring wells. Total metals testing began in July 2014 and was completed in April 2016. Following completion of the required monitoring, a Groundwater Monitoring Optimization Report was submitted to Ecology and the TPCHD in December 2016.

Consistent with the Groundwater Monitoring Optimization Report and approval received from Ecology, the groundwater monitoring frequency was changed from quarterly to semi-annual in 2017. The GWMP was revised on October 18, 2018 to reflect updates to the groundwater monitoring network, groundwater monitoring on a semi-annual schedule, and Appendix I metals testing on a five year schedule beginning in 2021. The October 18, 2018 GWMP is the current, approved, plan for HVL. Consistent with the October 2018 Groundwater Monitoring Plan, testing for Appendix I total metals will be performed again in 2026.

1.4 2023 MONITORING ACTIVITIES

Groundwater monitoring was performed in January (first semi-annual monitoring event) and July (second semi-annual monitoring event) during 2023. Leachate monitoring was conducted in May. Landfill gas (LFG) monitoring was performed monthly.

Monitoring results for the first semi-annual monitoring event of 2023 were previously submitted to Ecology and the TPCHD in a report dated September 15, 2023. Groundwater laboratory reports for the second semi-annual monitoring event of 2023 and an updated groundwater database will be provided to the TPCHD in a separate submittal. Groundwater laboratory reports will also be provided to Ecology as pdf files and groundwater data from 2023 will be uploaded into Ecology's Environmental Information Management (EIM) system database.



SOURCE: KLEINFELDER

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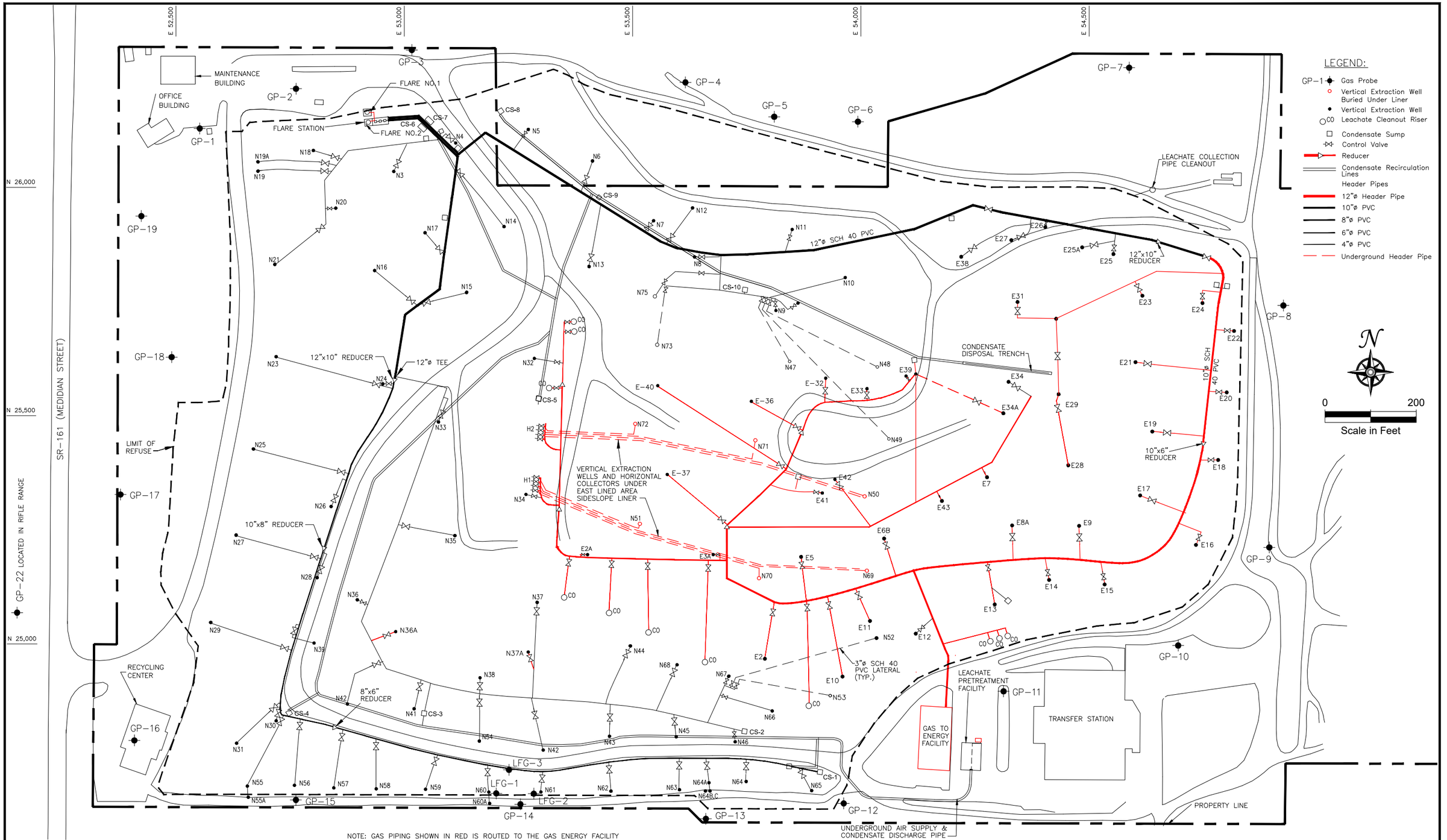
PROJECT NO. 04224002.03	DES BY LEL	SITE LOCATION MAP	DATE MARCH 2024
SCALE NOT TO SCALE	CHK BY JE	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	FIGURE 1
CAD FILE FIGURE 1	APP BY KGL		

2.0 LANDFILL GAS MONITORING

Landfill gas probes were monitored monthly during 2023. The landfill gas probes are installed in site soils near the perimeter of the landfill as illustrated on Figure 2. Parameters measured at the gas probes included carbon dioxide, oxygen, and combustible gas (measured as methane). Gas probe monitoring results were less than five percent methane by volume in all probes each month during 2023. Monthly gas probe monitoring results are included in Appendix A.

On-site buildings were monitored for the presence of combustible gas (measured as methane) on March 23, May 31, September 27, and November 15, 2023 using a flame ionization detector (FID). The main office, maintenance building, scale house/pay booth, recycling building, leachate treatment buildings No. 1 and No. 2, gas to energy building, and transfer station were monitored. No significant methane detections were reported above background concentrations in any of the buildings during 2023. Copies of the building survey reports are included in Appendix A.



NOTE: GAS PIPING SHOWN IN RED IS ROUTED TO THE GAS ENERGY FACILITY

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PROJECT NO. 04224002.03	DES BY KGL	GAS SYSTEM HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	DATE MARCH 2024
SCALE AS SHOWN	CHK BY JE		FIGURE 2
CAD FILE FIGURE 2	APP BY KGL		

3.0 LEAK DETECTION MONITORING

3.1 LEAK DETECTION SYSTEM

The East Lined Area at the Hidden Valley Landfill includes a leak detection system between the primary geosynthetic liner and the secondary composite liner in the portion of the cell that was constructed over refuse (side slope liner area). Pursuant to Section II C of the Stipulation and Agreed Order of Dismissal (Order), LRI was required to implement the March 1994 Leak Detection Response Action Plan (RAP) once refuse was placed onto the side slope liner. The RAP provides a mechanism for evaluating the performance of the side slope liner. Major components of the plan include routine monitoring of leachate quantities and fluid in the leak detection system, data analysis, record keeping, delineation of acceptable liner performance levels, response actions, and an outline of how groundwater impacts would be evaluated in the event that excessive leakage is observed in the leak detection system.

3.2 LINER PERFORMANCE STANDARD

The RAP defines an acceptable performance standard of 300 gallons per acre per day for the primary side-slope liner in the Cell 2 East Lined Area. The side slope liner covers approximately 13.5 acres of refuse, and therefore, the corresponding liner performance standard is 4,050 gallons per day.

3.3 SUMMARY OF PERFORMANCE DATA

Leachate volumes pumped from the main sump (Cell 1) and side-slope liner sump (Cell 2), as well as volumes pumped from the side-slope leak detection system and rainfall totals from an on-site rain gauge, are recorded on a daily basis by on-site personnel. A summary of monthly leachate volume data is provided in Exhibit 1, and copies of the monthly reports are included in Appendix B. The volume of fluid pumped from the side-slope liner leak detection system in 2023 remained well below the performance standard of 4,050 gallons per day defined in the RAP.

Exhibit 1. 2023 Leachate and Side Slope Liner Volumes Pumped Data

Month	Cell 1 Monthly Leachate Volume (gallons)	Cell 2 Monthly Leachate Volume (gallons)	Cell 2 Monthly Leakage Volume (gallons)	Monthly Rainfall (inches)
January	13,521	698	0	4.85
February	12,123	952	0	6.00
March	7,827	11	0	5.20
April	11,547	0	0	9.35
May	18,929	0	0	1.85
June	6,706	0	0	2.80
July	1,790	0	0	0.20
August	3,077	0	0	0.35
September	11,908	0	0	3.80
October	3,397	0	0	5.10
November	1,270	0	0	6.58
December	10,160	0	0	14.35
Year to date:	102,255	1,661	0	60.43

3.4 SUMMARY OF LEAK DETECTION MONITORING DATA

A sample of fluids that accumulate in the side-slope liner leak detection system was collected on May 11, 2023. The test results for this sample were similar to previous results and to the May 2023 test results from the side-slope leachate sump (see Appendix D, Table 10 Semi-Annual Monitoring Event No. 1).

3.5 HYDRAULIC GRADIENT CONTROL SYSTEM MONITORING

In addition to the leak detection system, a hydraulic gradient control system is present beneath the main leachate collection sump for the East Lined Area. This system is routinely checked for the presence of liquid. If liquids are removed, the volume pumped is recorded.

The hydraulic gradient control system was not pumped in 2023. However, a sample was collected from the hydraulic gradient control system on May 11, 2023. The results from this sample do not exhibit elevated levels of leachate indicator parameters such as ammonia, chloride, or total dissolved solids (see Appendix D, Table 10 Semi-Annual Monitoring Event No. 1).

4.0 GROUNDWATER LEVELS AND FLOW DIRECTIONS

4.1 LOCAL HYDROGEOLOGY

Hidden Valley Landfill is situated within a Vashon age glacial melt-water channel that trends in an east-west direction and is approximately 50 to 100 feet deep and several hundred feet wide. The northern boundary of the channel lies just north of the landfill. The landfill is underlain by glacial outwash deposits consisting of coarse sand and gravel to a depth of about 55 feet below grade. North of the landfill (and the outwash channel), the outwash deposits are overlain by Vashon till (upper till unit). The outwash deposits are underlain by successive layers of Vashon till (lower till unit), Vashon advance outwash, Salmon Springs till and interglacial deposits, and Salmon Springs advance outwash.

Three aquifers underlie the Hidden Valley Landfill. The aquifers are referred to as the shallow perched aquifer, the upper regional aquifer, and the lower regional aquifer. An intermittent aquitard, referred to as the Vashon till aquitard, is present between the shallow perched aquifer and the upper regional aquifer. A thick section of low permeability deposits referred to as the Salmon Springs aquitard separates the upper regional aquifer and the lower regional aquifer.

The shallow perched aquifer is an unconfined (water table) aquifer that occurs within the Vashon recessional outwash deposit. The shallow perched aquifer represents the uppermost-saturated unit at the site. Depth to groundwater within the lower areas of the glacial melt-water channel ranges from approximately 11 to 15 feet below ground surface (bgs) in winter and spring months to about 25 feet bgs in late fall. Groundwater flow in the shallow perched aquifer beneath the site is towards the northwest with local components to the north and west. The downgradient extent of the shallow perched aquifer appears to be limited. Northwest of the landfill, the recessional outwash is either not saturated, or saturated to only a few feet. In areas where the recessional outwash is unsaturated, the uppermost zone of groundwater saturation occurs within the lower Vashon till unit.

The upper regional aquifer is present within Vashon advance outwash deposits. This aquifer is confined beneath the Vashon till aquitard and appears to be of regional extent. Groundwater flow, water level gradients, and seasonal water level fluctuations in the upper regional aquifer are similar to the shallow perched aquifer.

The lower regional aquifer is present within the Salmon Springs advance outwash deposits. The aquifer is confined and is interpreted to be of regional extent. Monitoring wells BC-4R, MW-14R, and MW-20R are completed at similar depth elevations and display similar water levels. Monitoring well MW-26R is completed approximately 80 feet higher in elevation and may be installed within a water-bearing zone in the Salmon Springs aquitard.

Detailed descriptions of the hydrogeologic units, as well as geologic cross-sections and boring logs/monitoring well details are included in the *Hidden Valley Landfill Remedial Investigation Report* (EMCON, 1991) and *Hidden Valley Landfill Hydrogeologic Report Addendum* (EMCON, 1998).

4.2 WATER LEVEL MEASUREMENTS

Static water levels were measured on January 24-26 and July 18-19, 2023. The water level database and water level contour maps are presented in Appendix C.

Groundwater flow within both the shallow perched aquifer and the upper regional aquifer was generally toward the northwest during both of the 2023 monitoring events. Horizontal hydraulic gradients for both the shallow perched aquifer and the upper regional aquifer were less than 0.005 ft/ft in the central part of the site and approximately 0.025 ft/ft northwest of the landfill. This flow pattern remains consistent with previous data reported for the site. Water level gradients were similar to past measurements, indicating that the previously reported flow rates of 3.2 ft/day to 6.5 ft/day for the shallow perched aquifer and 0.5 to 1.3 ft/day for the upper regional aquifer have not changed significantly. Water level data for wells MW-14R, MW-20R, and BC-4R indicate that the groundwater flow direction in the lower regional aquifer is towards the northeast.

Background monitoring well MW-10S has a blockage approximately 5 feet down in the well. The blockage appears to be due to a compression fitting that was used to repair the pump tubing. Previous attempts to remove the pump and tubing were unsuccessful and the pump appears to be wedged at depth. The compression fitting often prevents advancement of the water level probe beyond that point. However, SCS staff were able to measure the water level at MW-10S during both semi-annual monitoring events in 2023.

5.0 GROUNDWATER QUALITY

During 2023, groundwater samples were collected on a semi-annual basis from twenty-one monitoring wells; including eleven wells completed within the shallow perched aquifer, seven wells completed within the upper regional aquifer, and three wells completed within the lower regional aquifer. Groundwater sampling locations are shown on Figure 3.

Groundwater quality summary data tables for each semi-annual monitoring event are provided in Appendix D. The summary tables include field parameters, laboratory parameters, and quality control samples. Time series plots for selected water quality parameters are included in Appendix E. Trilinear diagrams for each aquifer and leachate data are included in Appendix F. Statistical calculations performed on groundwater data are presented in Appendix G. The groundwater database will be provided to the TPCHD as a Microsoft Excel file in electronic format (on compact disk). In addition, groundwater data generated from the Hidden Valley Landfill during 2023 were validated and will be input into Ecology's EIM database system.

5.1 WATER SUPPLY WELL DATA

Water quality samples were collected from water supply wells at Corliss Resources, Inc. (Corliss) located immediately south of the landfill, and at the Paul Bunyan Rifle and Sportsman's Club (Paul Bunyan) located west of the landfill across Meridian East (see Figure 4).

No VOCs were detected in the water supply well samples collected during 2023. Low concentrations of total metals and inorganic parameters, including chloride and nitrate, indicate the water quality at the Corliss and Paul Bunyan water supply wells is not affected by the Hidden Valley Landfill. A summary of the laboratory test results for the water supply wells is provided in Exhibit 2.

5.2 BACKGROUND WATER QUALITY

Background water quality at the Hidden Valley Landfill is monitored using wells MW-10S (shallow perched aquifer) and MW-10D (upper regional aquifer). These wells have provided background water quality information since 1985.

In 2023, concentrations of inorganic parameters in samples from the background wells remained low and consistent with previous results. Concentrations of dissolved iron and manganese remained low or were not detected in the background well samples during 2023.

5.3 DOWNGRADIENT WATER QUALITY

Phased closure of the unlined portion of the landfill, which began in 1989 and was completed in 1993, included capping the waste with a low permeability composite cover and installing a landfill gas collection and control system (GCCS). The closure activities were designed to minimize the infiltration of precipitation through the refuse and remove landfill gas. These actions have improved the groundwater quality in the shallow perched aquifer and the upper regional aquifer.

Time series plots for specific conductance, ammonia, nitrate, dissolved iron, and dissolved manganese were prepared for wells in the shallow perched and upper regional aquifers that are located close to and downgradient of the landfill (MW-11S, MW-11D(2), MW-12S, MW-12D, MW-13S, MW-13D, MW-14S, MW-14D, and MW-17S, see Appendix E). The plots graphically display consistent trends of decreasing concentrations of water quality parameters in monitoring wells located downgradient of the landfill when the full data set is evaluated. However, over the last 10 years,

slightly increasing trends were noted for dissolved manganese at MW-17S and MW-14D, and dissolved iron at MW-13S and MW-14D (see Appendix E).

A cation-anion balance was prepared based in milliequivalents per liter (meq/L) for each groundwater sample to determine whether it was electro-neutral (balanced cation and anion charges). A threshold of ten percent difference was used if the total sum of cations and anions were less than or equal to 5.0 meq/L, and a threshold of five percent difference was used if the total cation-anion sums was greater than 5.0 meq/L. Calculated cation-anion balances were found to exceed these thresholds during at least one monitoring event during 2023 at MW-10S (background), MW-10D (background), MW-12S, MW-12D, MW-13S, MW-13D, MW-14S, MW-14D, MW-15D, MW-18S, FMMW-1, and FMMW-2 (see Appendix D). These latter balances may reflect the presence of ions outside the parameter suite being analyzed, possible errors associated with analytical limitations in the measurements, or impacts from human activities at the site

Trilinear (Piper) diagrams were prepared for groundwater sample results from each of the three water bearing zones at the landfill; the shallow perched aquifer, upper regional aquifer, and lower regional aquifer (see Appendix F). As shown on the attached trilinear diagrams, the groundwater sample results from all three aquifers and the hydraulic gradient control system plot within a consistent area of the graph, while the leachate results plot in a different area.

Measurements of pH collected in the field exceeded the lower threshold limit of the WAC 173-200 groundwater quality criteria of 6.5 at the majority of the shallow perched aquifer wells and at four upper regional aquifer wells on one or more occasion in 2023, including at background well MW-10S. Therefore, the pH values are interpreted to represent natural shallow and upper regional aquifer chemistry beneath the site.

The Hidden Valley Landfill Consent Decree established site groundwater cleanup levels and the groundwater point of compliance. Exhibit 3 provides a summary of the site-specific groundwater cleanup levels and identifies the monitoring events in 2023 when water quality results were greater than the site-specific cleanup levels.

Shallow perched aquifer water quality results exceeded the cleanup level for nitrate (FMMW-2) and dissolved manganese (MW-12S, MW-14S, MW-15S, MW-17S, and MW-29S) during at least one semi-annual monitoring event. Upper regional aquifer water quality results exceeded the site-specific cleanup level for dissolved iron (MW-14D) and dissolved manganese (MW-14D) during at least one semi-annual monitoring event. Lower regional aquifer water quality results exceeded the site-specific cleanup level for dissolved iron (MW-26R) and dissolved manganese (MW-14R and MW-26R) during at least one semi-annual monitoring event.

Results for the lower regional aquifer are interpreted to represent background water quality. As discussed in previous reports, the presence of dissolved iron and manganese in the lower regional aquifer does not appear to be related to the Hidden Valley Landfill. This interpretation is based on an overall assessment of the groundwater quality data, which include low concentrations of inorganic parameters and a general absence of VOCs.

The following VOC's were reported present in groundwater samples collected at the Hidden Valley Landfill in 2023:

- Tetrachloroethene (PCE) was reported present in samples from MW-11D(2) and MW-15D during both semi-annual monitoring events with concentrations between 0.92 and 1.3 µg/L. These detections are slightly greater than the WAC 173-200 groundwater quality criteria of

0.80 µg/L, but are consistent with recent monitoring results and are lower than the primary drinking water standard of 5.0 µg/L.

5.4 STATISTICAL ANALYSIS

Groundwater quality data for the five-year period of January 2019 through July 2023 were statistically evaluated and compared to site-specific cleanup levels for all monitoring wells in the groundwater-monitoring network. A compound-specific evaluation was used to determine the data distribution type for each compound as normal, lognormal, or non-parametric. The Consent Decree established a cleanup level for 1,4-dichlorobenzene at 1.82 micrograms per liter (µg/L). No other VOCs have Consent Decree defined cleanup levels for the Hidden Valley Landfill. However, the distribution of data was also determined for tetrachloroethene at well MW-11D(2) for tracking purposes. Chlorobenzene was evaluated in previous reports, but no detections of chlorobenzene were reported in groundwater samples collected over the past five years. Therefore, a statistical evaluation for this compound was discontinued.

If the data distribution was either normal or lognormal, the upper 95 percent confidence limits of the mean (UCL 95) were calculated for each data set using the MTCAStat 97: Site Module, obtained from Ecology. The MTCAStat program was used to evaluate data distributions (i.e., normal, lognormal, or neither) for constituents that were detected in at least 50 percent of the sampling events. One-half the MRL was used when a parameter was not detected at a concentration above the MRL.

If the distribution was neither normal nor lognormal, the UCL 95 was determined using the method of Van der Parren (1970) as described in the Statistical Guidance for Ecology Site Managers (Ecology 1992). For the data evaluated, this procedure defaults to the highest reported value. In addition, the highest reported value was used if either lognormal or normal distributions had the UCL 95 value outside of the data sample range. The UCL 95 was not calculated (NC) when any of the evaluated parameters were either not detected for 50 percent of the sampling events, or had less than five data entries.

Exhibit 4 provides a summary of UCL 95 values. Shallow perched aquifer UCL 95 values that exceed site-specific cleanup levels include nitrate (MW-11S, MW-12S, MW-15S, MW-17S, and FMMW-2) and dissolved manganese (MW-12S, MW-14S, MW-15S, MW-17S, and FMMW-2). Upper regional aquifer UCL 95 values that exceed site-specific cleanup levels include dissolved iron (MW-14D) and dissolved manganese (MW-14D and MW-15D). Lower regional aquifer UCL 95 values that exceed site-specific cleanup levels include dissolved iron (MW-26R) and dissolved manganese (MW-14R and MW-26R). Statistical calculations are provided in Appendix G. The statistical results are consistent with those reported in previous monitoring years.

Exhibit 2 2023 Water Supply Well Data Summary

Parameter	MRL	Corliss		Paul Bunyon	
		January-26	July-19	January-26	July-19
Volatile Organics (µg/L)					
No Detections	10.	*	*	*	*
Total Metals (mg/L)					
Arsenic	0.005	*	*	*	*
Iron	0.01	0.260	0.0087	0.013	0.15
Manganese	0.001	*	*	*	*
Zinc	0.01	0.024	0.014	*	0.025
Inorganic Parameters (mg/L)					
Chloride	0.2	7.3	7.0	5.6	8.8
Ammonia as Nitrogen	0.1	*	*	*	*
Nitrate as Nitrogen	0.2	2.1 H	0.94	1.0 H	1.9
Nitrite as Nitrogen	0.5	*H	*	*H	*
Sulfate	0.5	12.0	14	14	13
Chemical Oxygen Demand	10.0	--	--	--	--
Total Organic Carbon	1.0	*	*	*	*
Color	5.0	*	*	*	*
Field Parameters					
pH	—	7.32	7.10	7.36	7.07
Conductance (µS/cm)	—	187	310	295	306
Temperature (^{0}C)	—	8.8	32.2	9.7	18.13

^{0}C = Degrees Celsius

µS/cm = microSiemens per centimeter
* = Not reported at or above the Method Reporting Limit

Exhibit 3. 2023 Groundwater Quality Data versus Site-Specific Cleanup Levels (Page 1)

Shallow Perched Aquifer

Parameter	Cleanup Level	MW-10S (BG)	MW-11S	MW-12S	MW-13S	MW-14S	MW-15S	MW-17S	MW-18S	MW-29S	FMMW-1	FMMW-2
Inorganic (mg/L)												
Chloride	250	–	–	–	–	–	–	–	–	–	–	–
Nitrate as Nitrogen	10.0	–	–	–	–	–	–	–	–	–	–	**SA 1, 2**
Sulfate	250	–	–	–	–	–	–	–	–	–	–	–
Specific Conductance	700	–	–	–	–	–	–	–	–	–	–	–
TDS	500	–	–	–	–	–	–	–	–	–	–	–
Metals (mg/L)												
Iron	0.30	–	–	–	–	–	–	–	–	–	–	–
Manganese	0.05	–	–	**SA 1, 2**	–	**SA 1, 2**	**SA 1, 2**	**SA 1, 2**	–	**SA 1, 2**	–	–
Volatile Organics (µg/L)												
Tetrachloroethene	0.80[(a)]	–	–	–	–	–	–	–	–	–	–	–

Notes:
– indicates results were less than cleanup level.
SA indicates results were greater than cleanup level.
1 & 2 indicate the semi-annual monitoring event in which results were greater than the cleanup level.
(a) the referenced water quality criteria is from on WAC 173-200.

2023 Groundwater Quality Data versus Site-Specific Cleanup Levels (Page 2)

Upper Regional Aquifer and Lower Regional Aquifer

Parameter	Cleanup Level	Upper Regional Aquifer							Lower Regional Aquifer		
		MW-10D (BG)	MW-11D(2)	MW-12D	MW-13D	MW-14D	MW-15D	MW-18D	MW-14R	MW-20R	MW-26R
Inorganic (mg/L)											
Chloride	250	–	–	–	–	–	–	–	–	–	–
Nitrate as Nitrogen	10.0	–	–	–	–	–	–	–	–	–	–
Sulfate	250	–	–	–	–	–	–	–	–	–	–
Specific Conductance	700	–	–	–	–	–	–	–	–	–	–
TDS	500	–	–	–	–	–	–	–	–	–	–
Metals (mg/L)											
Iron	0.30	–	–	–	–	**SA 1, 2**	–	–	–	–	**SA 1, 2**
Manganese	0.05	–	–	–	–	**SA 1, 2**	–	–	**SA 1, 2**	–	**SA 1, 2**
Volatile Organics (µg/L)											
Tetrachloroethene	0.80	–	**SA 1, 2**	–	–	–	**SA 1, 2**	–	–	–	–

Notes:
– indicates results were less than cleanup level.
SA indicates results were greater than cleanup level.
1 & 2 indicate the semi-annual monitoring event in which results were greater than the cleanup level.
(a) the referenced water quality criteria is from on WAC 173-200.

Exhibit 4. Summary of 5-Year Groundwater Statistics (Page 1)

Shallow Perched Aquifer

Parameter	Cleanup Level	MW-10S (BG)	MW-11S	MW-12S	MW-13S	MW-14S	MW-15S	MW-17S	MW-18S	FMMW-1	FMMW-2
Inorganic (mg/L)											
Chloride	250	11.0*	17.8	32.0*	11.5	21.0*	15.5	15.6	16.0	15.0*	20.0*
Nitrate as Nitrogen	10.0	1.9*	**13.9**	**40.0***	7.0	1.6*	**13.2**	**24.0***	**16.5**	1.9	**21.6***
Sulfate	250	17.0*	11.6	19.6	19.3	6.0	8.6	6.0	11.1	16.0*	13.4
Specific Conductance	700	296	332	518*	272	319*	338	485	412	382*	432
TDS	500	170	210*	380*	169	138	201	267	241	190*	272
Metals (mg/L)											
Iron	0.30	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Manganese	0.05	NC	NC	**0.59**	NC	**1.4***	**1.2***	**1.4**	NC	NC	**0.25***
Volatile Organics (µg/L)											
1,4-Dichlorobenzene	1.82	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Tetrachloroethene	—	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:
Values shown are the upper confidence limit on the mean (UCL 95). Evaluated data are from January 2019 through July 2023.
Bold indicates greater than Cleanup Level.
(—) = not applicable.
(NC) = not calculated; less than 50 percent detection frequency.
(*) = maximum detected concentration listed because the UCL 95 calculated value was greater than the data range, or the distribution was neither normal nor lognormal.

Summary of 5-Year Groundwater Statistics (Page 2)

Upper Regional Aquifer and Lower Regional Aquifer

Parameter	Cleanup Level	Upper Regional Aquifer							Lower Regional Aquifer		
		MW-10D (BG)	MW-11D(2)	MW-12D	MW-13D	MW-14D	MW-15D	MW-18D	MW-14R	MW-20R	MW-26R
Inorganic (mg/L)											
Chloride	250	6.9	5.6	8.8	13.0*	10.2	9.4*	7.1	1.7*	1.6	4.7
Nitrate as Nitrogen	10.0	2.2	1.9*	1.5*	2.3	NC	0.82*	1.7	NC	NC	NC
Sulfate	250	15.0*	9.0	7.6*	17.2	10.6	11.0*	7.8	3.8*	3.4*	10.0
Specific Conductance	700	257	328*	318	310	262	309*	320	196*	228*	335*
TDS	500	162	320*	199	200*	430*	210*	190*	106	180*	150*
Metals (mg/L)											
Iron	0.30	NC	NC	NC	NC	**3.7**	NC	NC	0.09*	NC	**0.82***
Manganese	0.05	NC	NC	NC	NC	**1.4***	**0.06***	NC	**0.20***	NC	**0.43**
Volatile Organics (µg/L)											
1,4-Dichlorobenzene	1.82	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Tetrachloroethene	—	NC	1.3*	NC	NC	NC	NC	NC	NC	NC	NC

Notes:
Values shown are the upper confidence limit on the mean (UCL 95). Evaluated data are from January 2019 through July 2023.
Bold indicates greater than Cleanup Level.
(—) = not applicable.
(NC) = not calculated; less than 50 percent detection frequency.
(*) = maximum detected concentration listed because the UCL 95 calculated value was greater than the data range, or the distribution was neither normal nor lognormal.

LEGEND:

MW-12S — Existing Monitoring Well Location

BC-4R
BC-4S
FMMW-2
FMMW-1
MW-18D
MW-18S
MW-11D(2)
MW-11S
MW-15D
MW-15S
MW-14D
MW-14R
MW-14S
MW-26(R)
MW-17S
MW-12D
MW-12S
MW-29S
MW-13D
MW-13S
MW-10D
MW-10S
MW-19D
MW-19S
MW-20R

GP-1 GP-2 GP-3 GP-4 GP-5 GP-6 GP-7 GP-8 GP-9 GP-10 GP-11 GP-12 GP-13 GP-14 GP-15 GP-16 GP-17 GP-18 GP-19 GP-20 GP-21 GP-22

MAINTENANCE BUILDING
OFFICE BUILDING
LIMIT OF REFUSE
GP-22 LOCATED IN RIFLE RANGE

0 300 600

SCALE: 1" = 300'

CONTOUR INTERVAL = 5 FEET

SCS ENGINEERS
Environmental Consultants and Contractors
2405 140th Avenue NE, Suite 107
Bellevue, Washington 98005
(425) 746-4600 FAX: (425) 746-6747

PROJECT NO. 04224002.03	DES BY JE	GROUNDWATER MONITORING WELL LOCATIONS	DATE MARCH 2024
SCALE AS SHOWN	CHK BY KGL	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	FIGURE 3
CAD FILE FIGURE 3	APP BY KGL		

0 400 800

APPROX SCALE IN FEET

LEGEND

WATER SUPPLY WELL LOCATION

SOURCE: KLEINFELDER

SCS ENGINEERS
Environmental Consultants and Contractors
2405 140th Avenue NE, Suite 107
Bellevue, Washington 98005
(425) 746-4600 FAX: (425) 746-6747

PROJECT NO.	DES BY
04224002.03	LEL
SCALE	CHK BY
NOT TO SCALE	JE
CAD FILE	APP BY
FIGURE 4	KGL

WATER SUPPLY WELL LOCATION

HIDDEN VALLEY LANDFILL
PIERCE COUNTY, WASHINGTON

DATE
MARCH 2024

FIGURE
4

6.0 LEACHATE QUALITY

Leachate quality is monitored on an annual basis. Samples of untreated leachate were collected from the East Lined Area leachate collection system (main sump [Cell 1]) and the Side Slope Area leachate collection system (Cell 2) on May 11, 2023. The leachate samples were analyzed for the same parameter suite analyzed for the groundwater samples, as specified in the approved GWMP. Leachate quality results for 2023 were generally typical of previous results. The analytical results for the leachate samples are summarized below in Exhibit 5 and are included with the groundwater results in Appendix D.

Exhibit 5. 2023 Leachate Quality Data Summary

Parameters	MRL	Leachate – East Area Cell 1	Leachate – Side Slope Cell 2
Volatile Organics (µg/L)			
1,4-Dichlorobenzene	0.5-0.8	1.8	*
2-Butanone (MEK)	6.0	*	*
Acetone	10.0	11	*
Benzene	0.5-0.8	0.67	3.3
Carbon disulfide	0.5-0.84	0.95	2.4
cis-1,2-Dichloroethene	0.5-0.75	*	*
Ethylbenzene	1.0	*	1.7
m-Xylene & p-Xylene	0.5-0.77	2.9	2.0
o-Xylene	0.5-0.95	1.0	0.72
Toluene	0.5-0.85	0.88	3.1
Total Metals (mg/L)			
Calcium	0.2-0.78	76	11
Iron	0.01-0.02	2.00	0.87
Magnesium	0.1-0.26	49	20
Manganese	0.005	1.4	0.076
Potassium	2-2.4	230	510
Sodium	1-3.7	2,200	6,700
Inorganic Parameters (mg/L)			
Alkalinity	10	3,200	7,400
Ammonia	0.1-2.2	270	530
Chloride	0.2-60	2,500	8,900
Nitrate as N	0.5-0.9	* H	*
Sulfate	0.2-5.0	67	440
Total Dissolved Solids	10-470	4,600	17,000
Total Organic Carbon - Quad	1-35	390	880
Total Suspended Solids	4.0	*	10.0
Inorganic Parameters (mg/L)			
Dissolved Oxygen (mg/L)	—	5.25	0.49
Oxidation Reduction Potential (mV)	—	-83.3	269.2
pH (SU)	—	7.17	8.04
Specific Conductivity (µS/cm)	—	12,261	35,383
Temperature (°C)	—	18.9	28.5
Turbidity (NTU)	—	126.7	21.1

Notes:
Analyses performed by TestAmerica, Arvada, CO. H = Sample analyzed beyond specified holding time.
µg/L = micrograms per liter, mg/L = milligrams per liter. * = Not detected above MRL.
VOCs were not listed when not present at concentrations exceeding the MRL.

7.0 POST-CLOSURE MAINTENANCE

7.1 COVER SYSTEM MAINTENANCE

The landfill cover system was inspected on a quarterly basis during 2023. Informal cover inspections were also performed on an ongoing basis by LRI staff, as well as during the monthly LFG monitoring events. The cover system was found to be in good condition during 2023. Copies of the inspection reports are included in Appendix H.

7.2 LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS) MAINTENANCE

The LFG extraction wells, piping and blower/flare station were inspected, monitored and maintained on a monthly basis throughout 2023. In addition, the LFG condensate recirculation system was inspected quarterly during 2023 and the condensate sumps were observed to be working as designed. Sumps 5 and 10 did not collect condensate for a number of years, and therefore, the pumps were previously removed. Monthly records of GCCS maintenance activities and quarterly records of condensate sump inspections are included in Appendix I. A record of the monthly volume of LFG combusted and the average monthly methane concentration at the flare station is provided in Exhibit 6.

Exhibit 6. 2023 Flare Station Data

Month	LFG Volume Combusted (scf)	Methane (% by volume)
January	**4,884,498**	31.5
February	**3,843,530**	33.3
March	**7,692,107**	39.8
April	**4,459,718**	38.2
May	**9,530,302**	38.1
June	**6,815,342**	33.9
July	**6,699,096**	37.2
August	**3,229,906**	32.0
September	**6,080,686**	43.0
October	**5,178,990**	46.7
November	**2,667,800**	39.6
December	**4,410,620**	47.1
Totals	**65,492,595**	**37.7 (Average)**
Note: (scf) indicates standard cubic feet		

7.3 GROUNDWATER WELL MAINTENANCE

No significant well maintenance activities were performed in 2023.

Appendix A

LANDFILL GAS MONITORING DATA

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

4223002.03

PCRCD dba LRI

January 20, 2023

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	20-Jan-23	11:22	-0.16	0.0	4.0	12.5	--	--	
GP-1B	20-Jan-23	11:25	1.20	0.0	4.9	15.6	--	--	
GP-1C	20-Jan-23	11:28	0.70	0.0	1.1	18.9	--	--	
GP-2A	20-Jan-23	11:34	0.79	0.0	0.3	20.4	--	--	*Note 3*
GP-2B	20-Jan-23	11:37	1.08	0.0	0.1	20.7	--	--	
GP-3S	20-Jan-23	11:42	0.46	0.0	2.3	14.1	--	--	
GP-3M	20-Jan-23	11:45	0.04	0.0	6.0	3.7	--	--	
GP-3D	20-Jan-23	11:48	0.43	0.0	9.7	7.2	--	--	
GP-4A	20-Jan-23	12:03	0.07	0.0	0.3	20.7	--	--	
GP-4B	20-Jan-23	12:07	0.35	0.0	0.2	20.6	--	--	
GP-5A	20-Jan-23	12:12	0.07	0.0	0.1	20.7	--	--	
GP-5B	20-Jan-23	12:15	0.07	0.0	0.1	20.7	--	--	
GP-6	20-Jan-23	12:22	0.06	0.0	0.1	20.6	--	--	
GP-7S	20-Jan-23	12:28	0.51	0.0	0.3	20.4	--	--	
GP-7D	20-Jan-23	12:31	0.08	0.0	0.1	20.7	--	--	
GP-8A	20-Jan-23	12:38	0.07	0.0	3.4	17.9	--	--	
GP-8B	20-Jan-23	12:41	0.32	0.0	0.5	20.4	--	--	
GP-9	20-Jan-23	12:52	0.07	0.0	3.3	16.4	--	--	
GP-10	20-Jan-23	12:58	0.07	0.0	0.3	20.3	--	--	
GP-11	20-Jan-23	13:06	0.05	0.0	1.3	18.4	--	--	
GP-12	20-Jan-23	13:12	0.04	0.0	3.8	12.1	--	--	
GP-13A	20-Jan-23	13:18	0.50	0.0	4.6	14.5	--	--	
GP-13B	20-Jan-23	13:22	0.04	0.0	0.2	20.4	--	--	
GP-14S	20-Jan-23	13:27	0.50	0.0	4.9	16.3	--	--	
GP-14D	20-Jan-23	13:31	0.17	0.0	5.1	9.2	--	--	
GP-15A	20-Jan-23	13:36	0.42	0.0	3.8	14.1	--	--	
GP-15B	20-Jan-23	13:40	0.03	0.0	9.8	1.9	--	--	
GP-16A	20-Jan-23	13:46	0.02	0.0	3.0	16.8	--	--	
GP-16B	20-Jan-23	13:50	0.20	0.0	3.1	16.7	--	--	
GP-17	20-Jan-23	13:57	0.48	0.0	1.9	19.1	--	--	
GP-18	20-Jan-23	14:08	0.04	0.0	0.8	20.0	--	--	
GP-19	20-Jan-23	14:14	0.05	0.0	1.0	19.9	--	--	
LFG-1							-	-	*Note 2*
LFG-2							-	-	*Note 2*
LFG-3							-	-	*Note 2*

General Data

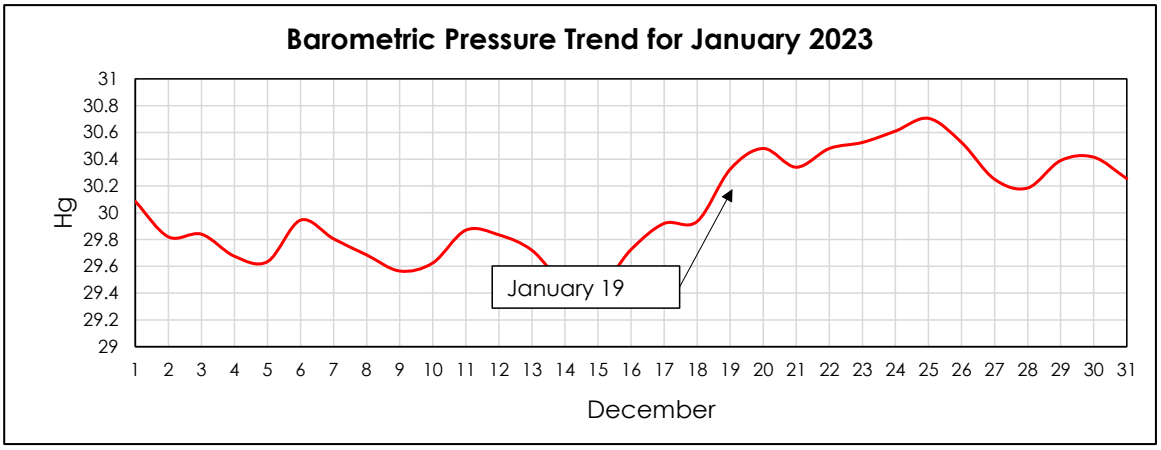
		Weather Conditions	
Monitored by:	J. Faille	Sky Cover:	Cloudy
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	20-Jan-23	Temperature (°F):	43

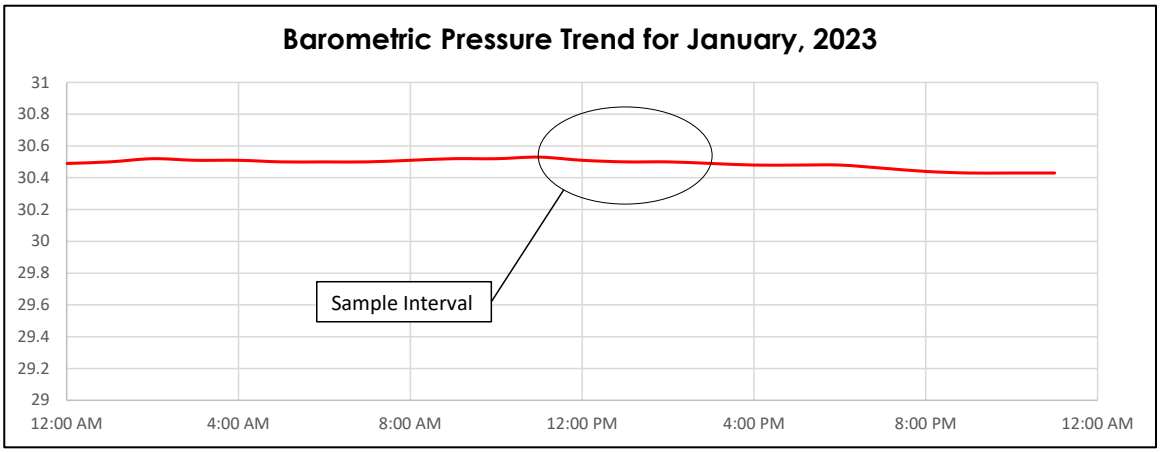
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not monitored. Probe casing rusted shut.
3. Extended stabilization period (240 seconds).

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend - January 2023
Hidden Valley Landfill, Pierce County, Washington





Monthly Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-01-20/2023-01-20/monthly

Daily Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-01-20/2023-01-20/daily

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

4223002.03

PCRCD dba LRI

February 21, 2023

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	21-Feb-23	10:14	0.08	0.0	0.1	21.1	--	--	
GP-1B	21-Feb-23	10:17	0.08	0.0	4.8	17.0	--	--	
GP-1C	21-Feb-23	10:20	-0.05	0.0	6.0	14.7	--	--	
GP-2A	21-Feb-23	10:27	0.08	3.9	12.5	5.5	--	--	*Note 3*
GP-2B	21-Feb-23	10:30	0.04	0.0	0.6	21.0	--	--	
GP-3S	21-Feb-23	10:36	0.05	0.0	3.4	13.7	--	--	
GP-3M	21-Feb-23	10:43	-0.03	0.2	7.6	0.8	--	--	
GP-3D	21-Feb-23	10:40	0.12	0.0	8.7	3.9	--	--	
GP-4A	21-Feb-23	10:51	0.08	0.0	0.5	20.9	--	--	
GP-4B	21-Feb-23	10:54	0.05	0.0	0.2	21.3	--	--	
GP-5A	21-Feb-23	11:02	0.08	0.0	0.1	21.2	--	--	
GP-5B	21-Feb-23	11:06	0.08	0.0	0.1	21.1	--	--	
GP-6	21-Feb-23	11:12	0.08	0.0	0.1	21.1	--	--	
GP-7S	21-Feb-23	11:21	0.09	0.0	0.2	21.1	--	--	
GP-7D	21-Feb-23	11:24	0.08	0.0	0.3	20.9	--	--	
GP-8A	21-Feb-23	11:34	0.08	0.0	0.1	21.2	--	--	
GP-8B	21-Feb-23	11:37	0.09	0.0	0.1	21.2	--	--	
GP-9	21-Feb-23	11:45	0.09	0.0	2.8	18.8	--	--	
GP-10	21-Feb-23	11:53	0.08	0.0	0.3	21.2	--	--	
GP-11	21-Feb-23	12:01	0.09	0.0	1.9	15.8	--	--	
GP-12	21-Feb-23	12:10	0.09	0.0	0.2	21.1	--	--	
GP-13A	21-Feb-23	12:17	0.08	0.8	11.1	2.1	--	--	
GP-13B	21-Feb-23	12:20	0.08	0.0	0.5	21.0	--	--	
GP-14S	21-Feb-23	12:26	0.06	0.0	5.0	17.0	--	--	
GP-14D	21-Feb-23	12:29	0.06	0.0	5.1	10.8	--	--	
GP-15A	21-Feb-23	12:38	0.09	0.0	3.5	14.0	--	--	
GP-15B	21-Feb-23	12:41	0.08	0.0	9.3	4.4	--	--	
GP-16A	21-Feb-23	9:57	0.08	0.0	1.0	20.6	--	--	
GP-16B	21-Feb-23	10:00	0.08	0.0	0.6	21.0	--	--	
GP-17	21-Feb-23	12:47	0.09	0.0	1.0	20.5	--	--	
GP-18	21-Feb-23	12:58	0.09	0.0	0.7	20.3	--	--	
GP-19	21-Feb-23	13:03	0.09	0.0	0.3	21.1	--	--	
LFG-1							-	-	*Note 2*
LFG-2							-	-	*Note 2*
LFG-3							-	-	*Note 2*

General Data

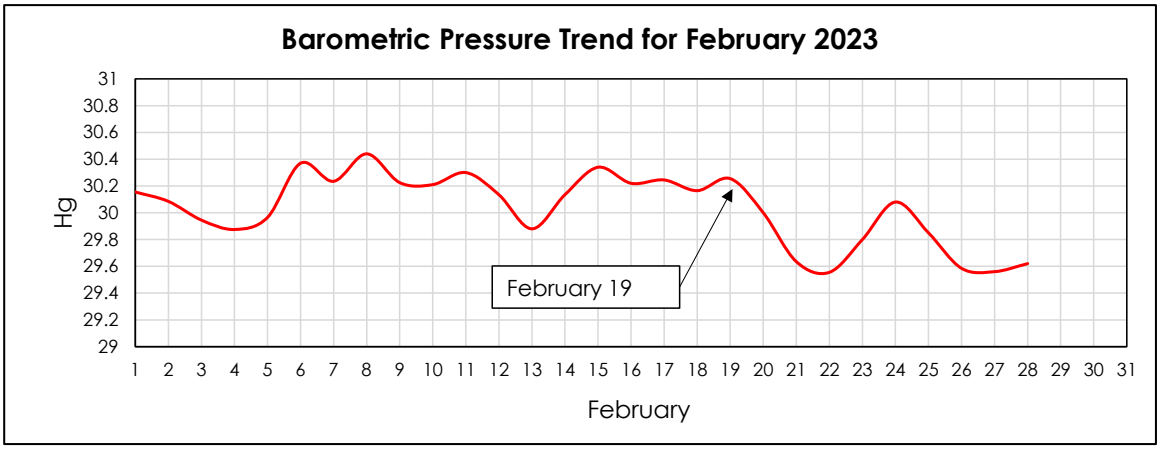
		Weather Conditions	
Monitored by:	L. Walker	Sky Cover:	Cloudy
Instruments:	GEM 2000	Wind / Rain / Snow:	Rain
Calibration Date:	21-Feb-23	Temperature (°F):	34

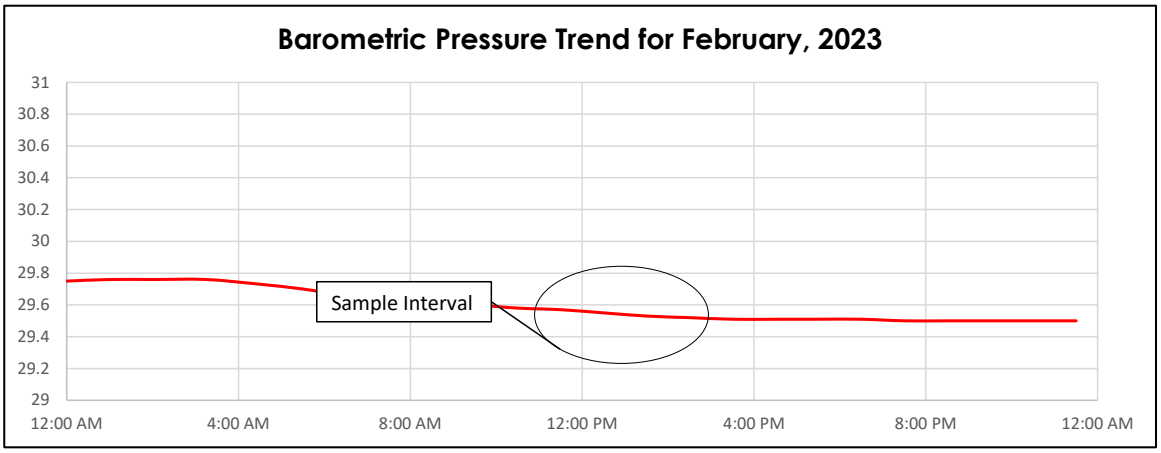
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not monitored. Probe casing rusted shut.
3. Extended stabilization period (240 seconds).

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend - February 2023
Hidden Valley Landfill, Pierce County, Washington





Monthly Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-02-21/2023-02-21/monthly

Daily Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-02-21/2023-02-21/daily

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

4223002.03

PCRCD dba LRI

March 21, 2023

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	21-Mar-23	9:32	-0.01	0.0	2.6	16.8	--	--	
GP-1B	21-Mar-23	9:35	0.01	0.0	2.5	19.5	--	--	
GP-1C	21-Mar-23	9:38	0.12	0.0	1.1	20.3	--	--	
GP-2A	21-Mar-23	9:45	0.03	1.1	2.8	17.4	--	--	*Note 3*
GP-2B	21-Mar-23	9:49	0.01	0.0	0.2	21.9	--	--	
GP-3S	21-Mar-23	9:55	0.01	0.0	2.0	15.6	--	--	
GP-3M	21-Mar-23	9:58	0.01	1.5	5.4	5.4	--	--	
GP-3D	21-Mar-23	10:01	0.03	1.7	7.1	9.5	--	--	
GP-4A	21-Mar-23	10:10	0.02	0.0	0.4	22.0	--	--	
GP-4B	21-Mar-23	10:13	0.01	0.0	0.1	22.1	--	--	
GP-5A	21-Mar-23	10:20	0.00	0.0	0.1	21.8	--	--	
GP-5B	21-Mar-23	10:23	0.00	0.0	0.1	21.9	--	--	
GP-6	21-Mar-23	10:28	0.00	0.0	0.1	21.8	--	--	
GP-7S	21-Mar-23	10:35	-0.01	0.0	0.2	21.5	--	--	
GP-7D	21-Mar-23	10:38	0.00	0.0	0.1	21.8	--	--	
GP-8A	21-Mar-23	10:55	0.05	0.0	1.9	19.7	--	--	
GP-8B	21-Mar-23	10:58	0.33	0.0	1.2	19.7	--	--	
GP-9	21-Mar-23	11:06	0.01	0.0	1.0	20.8	--	--	
GP-10	21-Mar-23	11:13	0.01	0.0	0.2	22.0	--	--	
GP-11	21-Mar-23	11:21	0.02	0.0	0.7	20.5	--	--	
GP-12	21-Mar-23	11:31	0.02	0.0	0.3	21.5	--	--	
GP-13A	21-Mar-23	11:38	0.02	0.0	0.1	22.1	--	--	
GP-13B	21-Mar-23	11:42	0.01	0.0	0.1	22.1	--	--	
GP-14S	21-Mar-23	11:49	0.11	0.0	2.6	19.5	--	--	
GP-14D	21-Mar-23	11:52	0.00	0.0	1.2	18.4	--	--	
GP-15A	21-Mar-23	11:57	0.21	0.0	5.8	8.8	--	--	
GP-15B	21-Mar-23	12:00	0.02	0.0	9.0	4.6	--	--	
GP-16A	21-Mar-23	12:07	0.00	0.0	0.5	21.8	--	--	
GP-16B	21-Mar-23	12:10	0.00	0.0	0.3	21.8	--	--	
GP-17	21-Mar-23	12:17	0.00	0.0	0.6	21.6	--	--	
GP-18	21-Mar-23	12:22	0.01	0.0	0.2	22.2	--	--	
GP-19	21-Mar-23	12:25	0.01	0.0	0.3	21.8	--	--	
LFG-1							-	-	*Note 2*
LFG-2							-	-	*Note 2*
LFG-3							-	-	*Note 2*

General Data

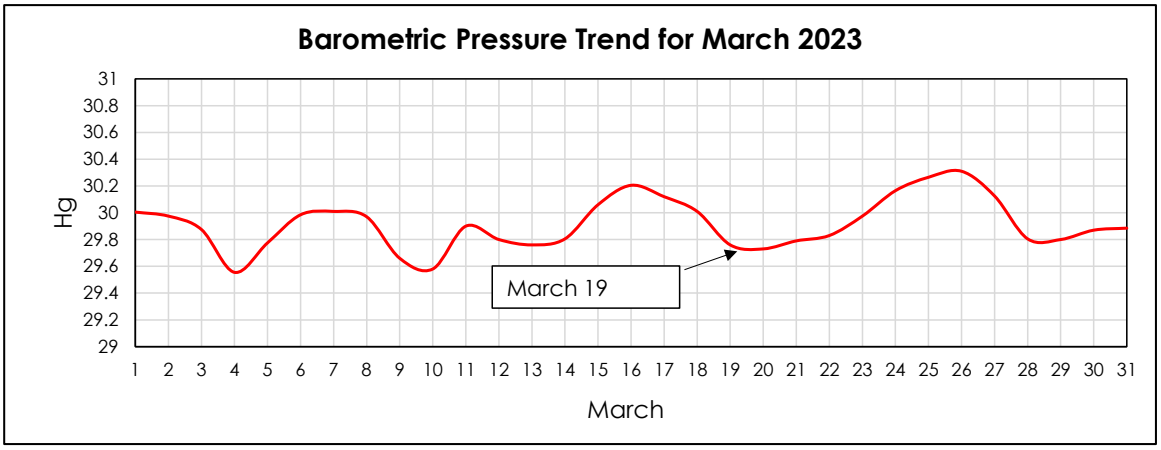
		Weather Conditions	
Monitored by:	L. Walker	Sky Cover:	Cloudy
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	21-Mar-23	Temperature (°F):	50

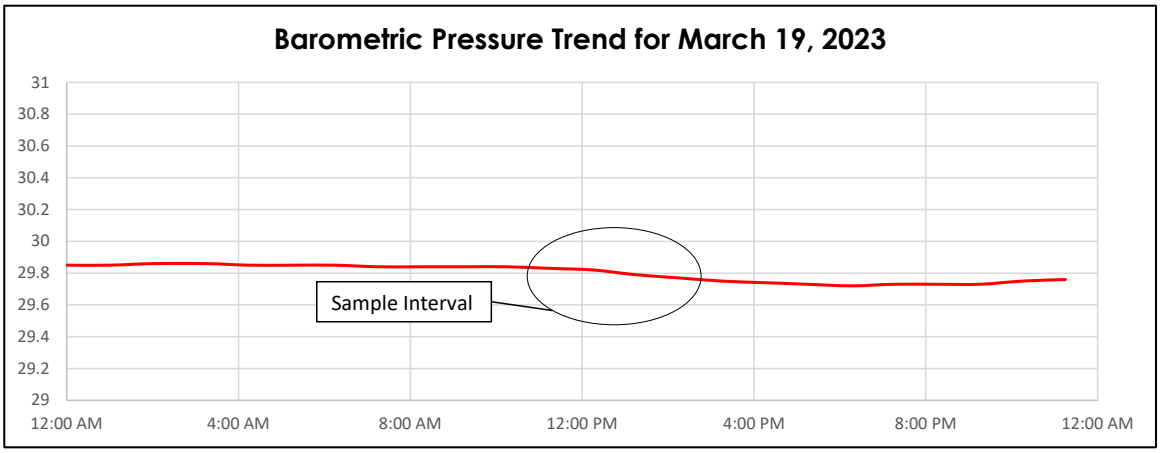
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not monitored. Probe casing rusted shut.
3. Extended stabilization period (240 seconds).

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend - March 2023
Hidden Valley Landfill, Pierce County, Washington





Monthly Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-03-21/2023-03-21/monthly

Daily Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-03-21/2023-03-21/daily

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

4223002.03

PCRCD dba LRI

April 26, 2023

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	26-Apr-23	10:32	-0.01	0.0	4.0	14.0	--	--	
GP-1B	26-Apr-23	10:35	0.01	0.0	4.1	17.1	--	--	
GP-1C	26-Apr-23	10:39	0.00	0.0	2.1	18.2	--	--	
GP-2A	26-Apr-23	10:44	0.07	0.2	1.3	18.5	--	--	*Note 3*
GP-2B	26-Apr-23	10:46	0.04	0.0	0.3	20.2	--	--	
GP-3S	26-Apr-23	10:51	-0.05	0.0	2.5	14.0	--	--	
GP-3M	26-Apr-23	10:54	-0.02	2.2	6.9	0.5	--	--	
GP-3D	26-Apr-23	10:57	-0.01	3.9	12.1	1.9	--	--	
GP-4A	26-Apr-23	11:05	-0.02	0.0	0.4	20.5	--	--	
GP-4B	26-Apr-23	11:07	0.14	0.0	0.2	20.5	--	--	
GP-5A	26-Apr-23	11:14	-0.13	0.0	0.1	20.5	--	--	
GP-5B	26-Apr-23	11:16	-0.03	0.0	0.1	20.6	--	--	
GP-6	26-Apr-23	11:20	-0.02	0.0	0.1	20.3	--	--	
GP-7S	26-Apr-23	11:26	0.38	0.0	0.5	19.8	--	--	
GP-7D	26-Apr-23	11:28	-0.07	0.0	0.1	20.3	--	--	
GP-8A	26-Apr-23	11:38	-0.08	0.0	1.5	18.9	--	--	
GP-8B	26-Apr-23	11:40	-0.05	0.0	0.8	19.3	--	--	
GP-9	26-Apr-23	11:46	0.02	0.0	1.6	18.4	--	--	
GP-10	26-Apr-23	11:53	0.20	0.0	0.1	20.2	--	--	
GP-11	26-Apr-23	11:58	-0.08	0.0	0.8	19.2	--	--	
GP-12	26-Apr-23	12:05	-0.08	0.0	0.1	20.0	--	--	
GP-13A	26-Apr-23	12:09	-0.19	0.0	1.3	17.1	--	--	
GP-13B	26-Apr-23	12:11	0.06	0.0	0.2	20.1	--	--	
GP-14S	26-Apr-23	12:16	0.05	0.0	3.7	16.8	--	--	
GP-14D	26-Apr-23	12:19	-0.09	0.0	0.2	20.1	--	--	
GP-15A	26-Apr-23	12:24	0.00	0.0	2.5	16.6	--	--	
GP-15B	26-Apr-23	12:27	-0.10	0.0	8.2	4.9	--	--	
GP-16A	26-Apr-23	12:34	-0.19	0.0	1.4	18.5	--	--	
GP-16B	26-Apr-23	12:37	-0.69	0.0	1.1	19.0	--	--	
GP-17	26-Apr-23	12:45	-0.03	0.0	0.8	19.7	--	--	
GP-18	26-Apr-23	12:50	-0.09	0.0	1.7	18.6	--	--	
GP-19	26-Apr-23	12:54	-0.08	0.0	1.7	18.6	--	--	
LFG-1							-	-	*Note 2*
LFG-2							-	-	*Note 2*
LFG-3							-	-	*Note 2*

General Data

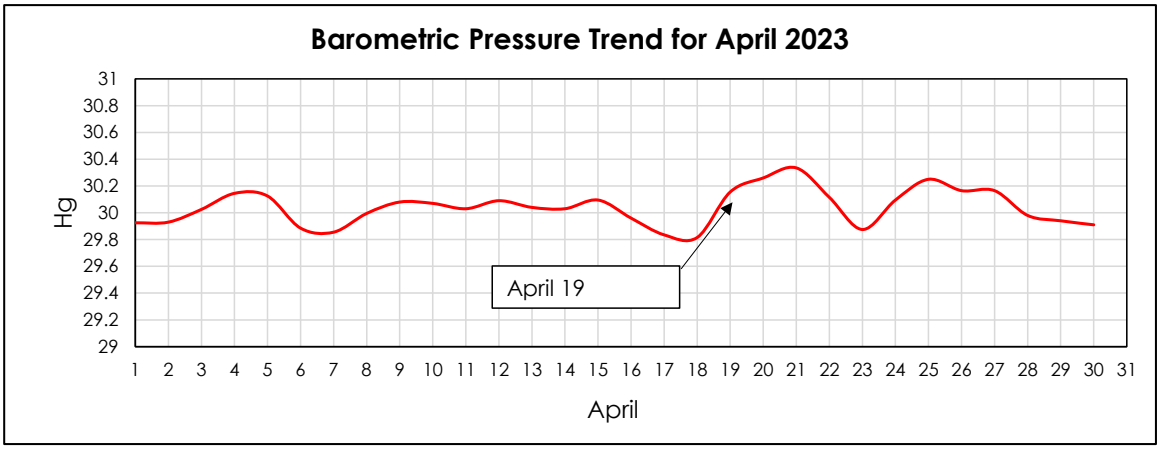
		Weather Conditions	
Monitored by:	L. Walker	Sky Cover:	Cloudy
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	26-Apr-23	Temperature (°F):	57

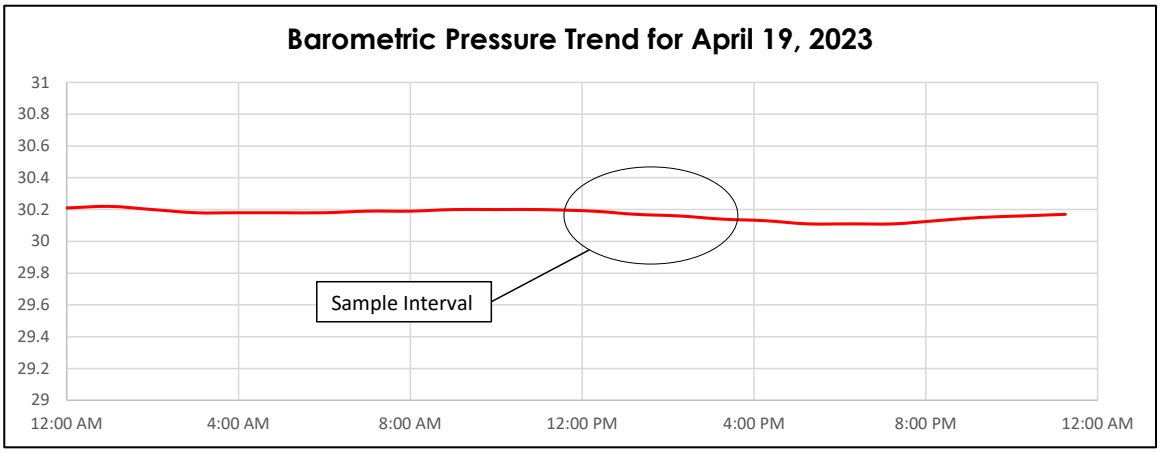
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not monitored. Probe casing rusted shut.
3. Extended stabilization period (240 seconds).

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend - April 2023
Hidden Valley Landfill, Pierce County, Washington





Monthly Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-04-26/2023-04-26/monthly

Daily Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-04-26/2023-04-26/daily

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

4223002.03

PCRCD dba LRI

May 31, 2023

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	31-May-23	10:25	0.66	0.0	3.3	13.4	--	--	
GP-1B	31-May-23	10:28	0.36	0.0	3.5	17.4	--	--	
GP-1C	31-May-23	10:31	0.01	0.0	0.9	20.0	--	--	
GP-2A	31-May-23	10:38	0.01	0.1	0.6	19.7	--	--	*Note 3*
GP-2B	31-May-23	10:41	0.05	0.0	0.2	20.7	--	--	
GP-3S	31-May-23	10:47	0.03	0.0	0.7	18.9	--	--	
GP-3M	31-May-23	10:50	0.04	2.1	6.2	0.3	--	--	
GP-3D	31-May-23	10:53	0.00	0.0	5.8	16.2	--	--	
GP-4A	31-May-23	11:04	0.00	0.0	0.4	20.7	--	--	
GP-4B	31-May-23	11:08	0.17	0.0	0.2	20.7	--	--	
GP-5A	31-May-23	11:14	-0.01	0.0	0.1	20.7	--	--	
GP-5B	31-May-23	11:18	-0.01	0.0	0.0	20.7	--	--	
GP-6	31-May-23	11:23	-0.01	0.0	0.1	20.5	--	--	
GP-7S	31-May-23	11:30	-0.02	0.0	0.5	20.0	--	--	
GP-7D	31-May-23	11:34	-0.03	0.0	0.3	20.1	--	--	
GP-8A	31-May-23	11:43	-0.03	0.0	4.3	14.6	--	--	
GP-8B	31-May-23	11:45	-0.03	0.0	3.2	17.8	--	--	
GP-9	31-May-23	11:51	-0.04	0.0	2.0	17.9	--	--	
GP-10	31-May-23	11:59	-0.05	0.0	0.3	20.4	--	--	
GP-11	31-May-23	12:05	-0.01	0.0	0.9	19.8	--	--	
GP-12	31-May-23	12:12	-0.05	0.0	0.7	16.5	--	--	
GP-13A	31-May-23	12:18	-0.04	0.0	1.1	18.2	--	--	
GP-13B	31-May-23	12:21	0.00	0.0	0.2	20.8	--	--	
GP-14S	31-May-23	12:26	-0.05	0.0	3.8	17.0	--	--	
GP-14D	31-May-23	12:30	0.02	0.0	4.8	9.7	--	--	
GP-15A	31-May-23	12:36	-0.05	0.0	3.4	17.4	--	--	
GP-15B	31-May-23	12:37	-0.02	0.0	1.8	20.4	--	--	
GP-16A	31-May-23	12:39	-0.04	0.0	7.6	12.3	--	--	
GP-16B	31-May-23	12:47	-0.05	0.0	0.7	20.4	--	--	
GP-17	31-May-23	12:51	0.13	0.0	0.9	19.5	--	--	
GP-18	31-May-23	12:58	0.46	0.0	1.5	17.7	--	--	
GP-19	31-May-23	13:04	-0.03	0.0	5.2	14.0	--	--	
LFG-1							-	-	*Note 2*
LFG-2							-	-	*Note 2*
LFG-3							-	-	*Note 2*

General Data

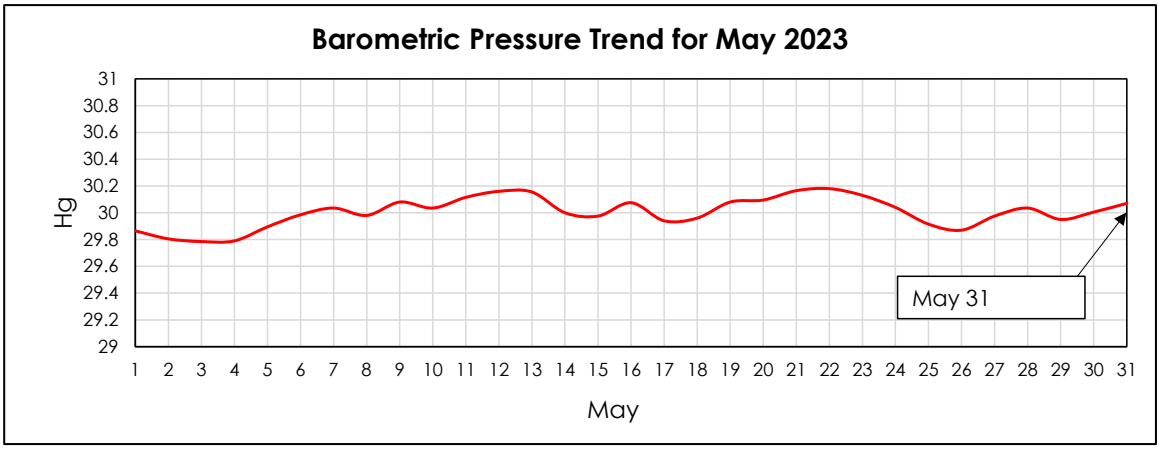
		Weather Conditions	
Monitored by:	J. Faille	Sky Cover:	Cloudy
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	31-May-23	Temperature (°F):	58

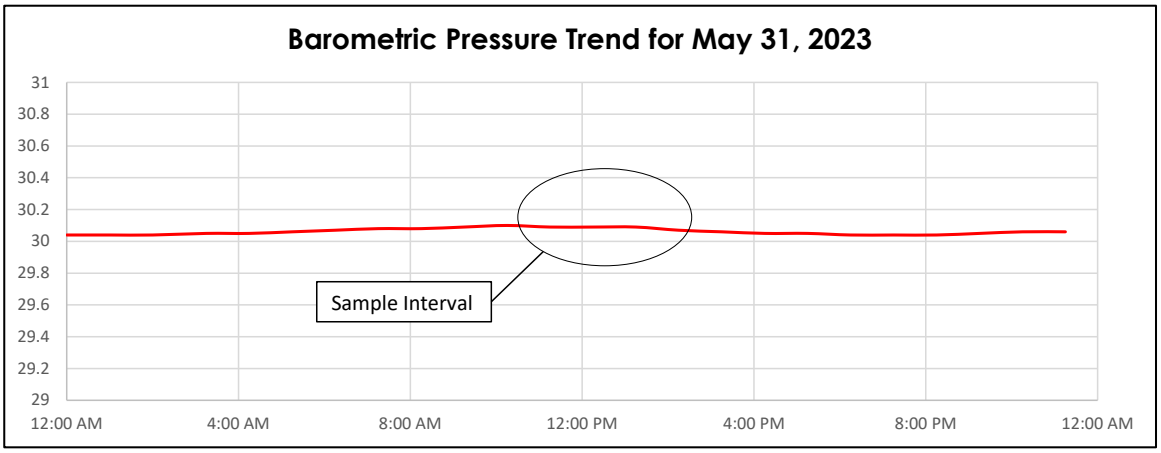
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not monitored. Probe casing rusted shut.
3. Extended stabilization period (240 seconds).

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend - May 2023
Hidden Valley Landfill, Pierce County, Washington





Monthly Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-05-31/2023-05-31/monthly

Daily Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-05-31/2023-05-31/daily

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

4223002.03

PCRCD dba LRI

June 28, 2023

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	28-Jun-23	8:39	0.03	0.0	4.6	11.4	--	--	
GP-1B	28-Jun-23	8:43	0.20	0.0	4.7	15.9	--	--	
GP-1C	28-Jun-23	8:50	0.02	0.0	1.4	19.8	--	--	
GP-2A	28-Jun-23	8:57	0.02	0.3	1.4	18.8	--	--	
GP-2B	28-Jun-23	9:02	0.04	0.0	0.2	21.2	--	--	
GP-3S	28-Jun-23	9:09	-0.03	0.0	1.0	19.6	--	--	
GP-3M	28-Jun-23	9:18	-0.03	0.0	5.2	14.8	--	--	
GP-3D	28-Jun-23	9:30	0.00	0.0	1.3	19.0	--	--	
GP-4A	28-Jun-23	9:35	-0.01	0.0	0.1	21.0	--	--	
GP-4B	28-Jun-23	9:44	-0.03	0.0	0.2	20.6	--	--	
GP-5A	28-Jun-23	9:48	-0.04	0.0	0.7	18.0	--	--	
GP-5B	28-Jun-23	9:57	-0.05	0.0	0.3	20.6	--	--	
GP-6	28-Jun-23	10:05	-0.06	0.0	0.6	20.0	--	--	
GP-7S	28-Jun-23	10:09	-0.07	0.0	0.4	20.0	--	--	
GP-7D	28-Jun-23	10:19	-0.07	0.0	6.0	10.4	--	--	
GP-8A	28-Jun-23	10:24	-0.08	0.0	5.6	12.4	--	--	
GP-8B	28-Jun-23	10:37	-0.10	0.0	2.4	16.2	--	--	
GP-9	28-Jun-23	10:46	-0.10	0.0	0.2	20.0	--	--	
GP-10	28-Jun-23	10:54	-0.11	0.0	0.9	19.9	--	--	
GP-11	28-Jun-23	11:01	-0.11	0.0	5.3	11.5	--	--	
GP-12	28-Jun-23	11:08	-0.11	0.0	0.1	21.2	--	--	
GP-13A	28-Jun-23	11:12	-0.10	0.0	0.0	21.2	--	--	
GP-13B	28-Jun-23	11:20	-0.12	0.0	3.6	17.7	--	--	
GP-14S	28-Jun-23	11:24	-0.12	0.0	4.1	11.0	--	--	
GP-14D	28-Jun-23	11:31	-0.12	0.0	3.1	17.6	--	--	
GP-15A	28-Jun-23	11:35	-0.12	0.0	6.3	12.6	--	--	
GP-15B	28-Jun-23	11:50	-0.15	0.0	0.4	20.5	--	--	
GP-16A	28-Jun-23	11:55	-0.03	0.0	0.4	20.7	--	--	
GP-16B	28-Jun-23	12:04	-0.13	0.0	4.1	11.8	--	--	
GP-17	28-Jun-23	12:12	-0.11	0.0	8.5	7.2	--	--	
GP-18	28-Jun-23	12:19	-0.11	0.0	0.4	21.3	--	--	
GP-19	0-Jan-00	0:00	0.00	0.0	0.0	0.0	--	--	
LFG-1							-	-	*Note 2*
LFG-2							-	-	*Note 2*
LFG-3							-	-	*Note 2*

General Data

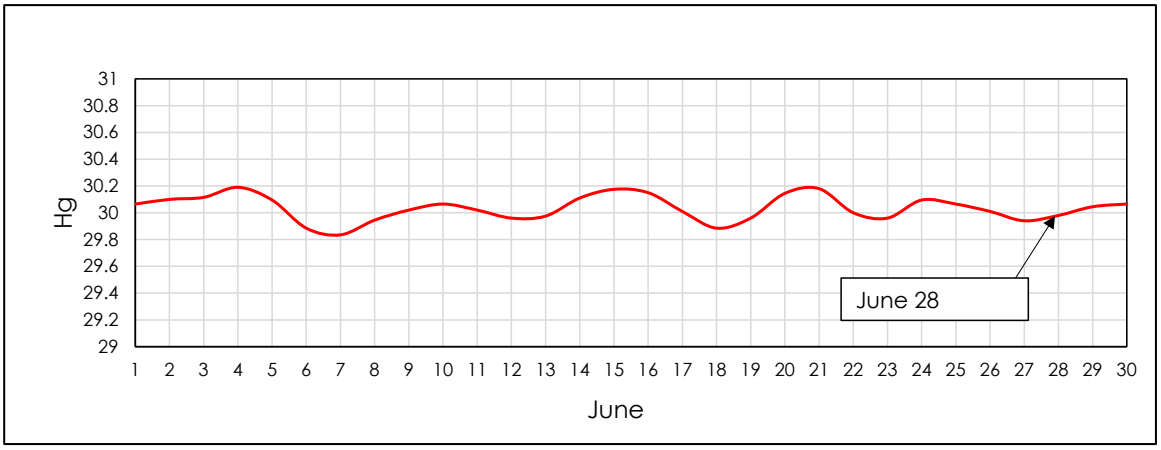
		Weather Conditions	
Monitored by:	A. Deszo	Sky Cover:	Sunny
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	28-Jun-23	Temperature (°F):	57

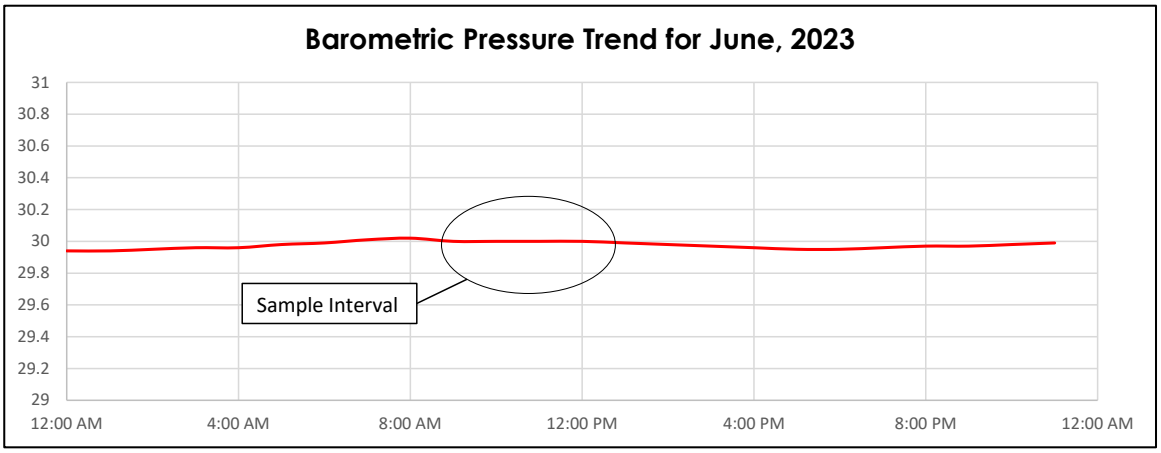
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not monitored. Probe casing rusted shut.
3. Extended stabilization period (240 seconds).

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend - June 2023
Hidden Valley Landfill, Pierce County, Washington





Monthly Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-06-31/2023-06-31/monthly

Daily Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-06-28/2023-06-28/daily

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

4223002.03

PCRCD dba LRI

July 18, 2023

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	18-Jul-23	10:52	0.00	0.0	3.2	12.3	--	--	
GP-1B	18-Jul-23	10:56	-0.01	0.0	3.5	16.7	--	--	
GP-1C	18-Jul-23	10:59	-0.02	0.0	0.5	20.0	--	--	
GP-2A	18-Jul-23	11:05	-0.02	0.0	0.2	20.2	--	--	
GP-2B	18-Jul-23	11:09	0.07	0.0	0.1	20.3	--	--	
GP-3S	18-Jul-23	11:15	-0.07	0.0	0.4	19.6	--	--	
GP-3M	18-Jul-23	11:19	0.06	0.0	5.5	2.7	--	--	
GP-3D	18-Jul-23	11:22	-0.06	0.0	3.6	18.0	--	--	
GP-4A	18-Jul-23	12:35	-0.15	0.0	3.4	16.4	--	--	
GP-4B	18-Jul-23	12:38	0.22	0.0	0.2	20.2	--	--	
GP-5A	18-Jul-23	12:45	-0.14	0.0	0.3	19.6	--	--	
GP-5B	18-Jul-23	12:48	-0.14	0.0	1.7	15.8	--	--	
GP-6	18-Jul-23	12:53	-0.17	0.0	0.2	20.5	--	--	
GP-7S	18-Jul-23	12:59	-0.17	0.0	0.5	19.8	--	--	
GP-7D	18-Jul-23	13:02	-0.18	0.0	0.3	20.3	--	--	
GP-8A	18-Jul-23	13:11	0.13	0.0	6.0	13.4	--	--	
GP-8B	18-Jul-23	13:14	-0.14	0.0	5.2	15.4	--	--	
GP-9	18-Jul-23	13:20	-0.19	0.0	0.5	17.2	--	--	
GP-10	18-Jul-23	13:25	-0.01	0.0	1.0	17.7	--	--	
GP-11	18-Jul-23	13:38	-0.21	0.0	3.6	14.8	--	--	
GP-12	18-Jul-23	13:39	-0.20	0.0	3.7	14.8	--	--	
GP-13A	18-Jul-23	13:44	-0.12	0.0	2.1	16.1	--	--	
GP-13B	18-Jul-23	13:48	-0.21	0.0	0.1	21.0	--	--	
GP-14S	18-Jul-23	13:53	0.13	0.0	3.8	17.4	--	--	
GP-14D	18-Jul-23	13:56	0.02	0.0	4.0	10.2	--	--	
GP-15A	18-Jul-23	14:01	-0.20	0.0	1.3	19.5	--	--	
GP-15B	18-Jul-23	14:04	-0.19	0.0	4.9	15.2	--	--	
GP-16A	18-Jul-23	14:11	-0.18	0.0	1.6	18.2	--	--	
GP-16B	18-Jul-23	14:14	0.16	0.0	1.4	18.4	--	--	
GP-17	18-Jul-23	14:21	0.24	0.0	3.8	10.0	--	--	
GP-18	18-Jul-23	14:26	-0.16	0.0	9.8	8.8	--	--	
GP-19	18-Jul-23	14:30	-0.17	0.0	10.5	8.5	--	--	
LFG-1							-	-	*Note 2*
LFG-2							-	-	*Note 2*
LFG-3							-	-	*Note 2*

General Data

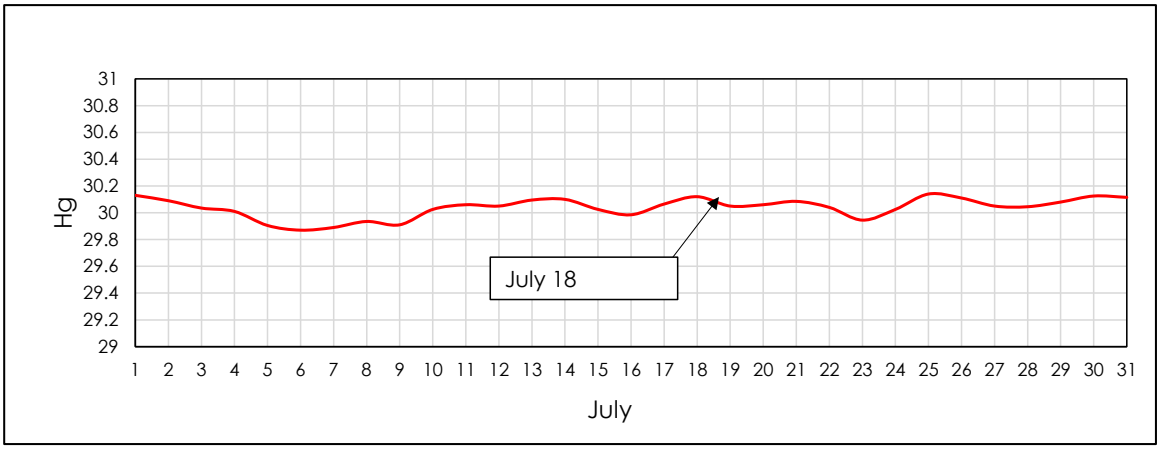
		Weather Conditions	
Monitored by:	L. Walker	Sky Cover:	Sunny
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	18-Jul-23	Temperature (°F):	72

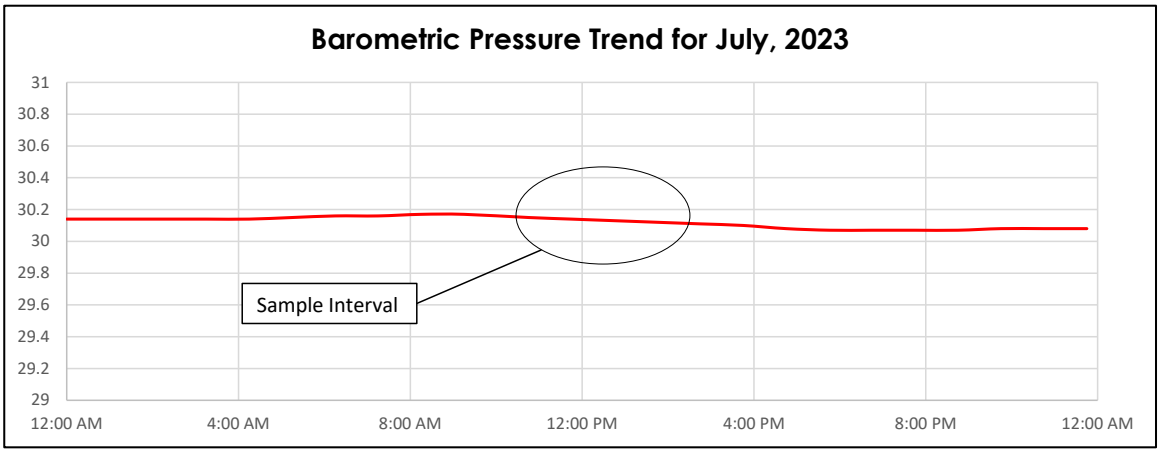
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not monitored. Probe casing rusted shut.
3. Extended stabilization period (240 seconds).

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend - July 2023
Hidden Valley Landfill, Pierce County, Washington





Monthly Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-07-31/2023-07-31/monthly

Daily Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-07-18/2023-07-18/daily

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill
PCRCD dba LRI

4223002.03
August 25, 2023

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	25-Aug-23	8:45	-0.11	0.0	5.1	7.9	--	--	
GP-1B	25-Aug-23	8:50	-0.09	0.0	4.3	17.1	--	--	
GP-1C	25-Aug-23	8:56	-0.07	0.0	1.3	20.4	--	--	
GP-2A	25-Aug-23	9:08	-0.08	0.1	1.1	19.4	--	--	
GP-2B	25-Aug-23	9:17	0.00	0.0	0.1	21.7	--	--	
GP-3S	25-Aug-23	9:26	-0.07	0.0	1.2	20.4	--	--	
GP-3M	25-Aug-23	9:32	-0.04	0.0	5.3	14.7	--	--	
GP-3D	25-Aug-23	9:39	-0.02	0.0	2.8	19.5	--	--	
GP-4A	25-Aug-23	9:49	0.02	0.0	0.3	21.6	--	--	
GP-4B	25-Aug-23	9:55	0.02	0.0	0.6	21.1	--	--	
GP-5A	25-Aug-23	10:04	0.00	0.0	0.5	20.8	--	--	
GP-5B	25-Aug-23	10:11	0.01	0.0	0.1	21.7	--	--	
GP-6	25-Aug-23	10:19	0.01	0.0	0.5	21.0	--	--	
GP-7S	25-Aug-23	10:28	0.00	0.0	1.0	21.1	--	--	
GP-7D	25-Aug-23	10:36	0.01	0.0	0.1	21.7	--	--	
GP-8A	25-Aug-23	10:50	0.01	0.0	7.1	15.7	--	--	
GP-8B	25-Aug-23	11:00	0.01	0.0	5.4	16.1	--	--	
GP-9	25-Aug-23	11:21	0.00	0.0	3.0	14.7	--	--	
GP-10	25-Aug-23	11:32	0.00	0.0	1.4	19.7	--	--	
GP-11	25-Aug-23	11:40	-0.01	0.0	1.0	20.3	--	--	
GP-12	25-Aug-23	11:48	-0.02	0.0	5.8	14.1	--	--	
GP-13A	25-Aug-23	11:56	-0.03	0.0	14.9	2.5	--	--	
GP-13B	25-Aug-23	12:02	0.00	0.0	0.2	21.0	--	--	
GP-14S	25-Aug-23	12:09	-0.05	0.0	3.3	18.3	--	--	
GP-14D	25-Aug-23	12:14	-0.07	0.0	3.8	11.7	--	--	
GP-15A	25-Aug-23	12:21	-0.07	0.0	2.3	18.2	--	--	
GP-15B	25-Aug-23	12:26	-0.08	0.0	5.5	13.8	--	--	
GP-16A	25-Aug-23	12:35	-0.10	0.0	1.9	17.9	--	--	
GP-16B	25-Aug-23	12:41	-0.03	0.0	2.1	17.8	--	--	
GP-17	25-Aug-23	12:51	-0.09	0.0	8.0	5.5	--	--	
GP-18	25-Aug-23	12:58	-0.08	0.0	12.1	9.3	--	--	
GP-19	25-Aug-23	13:10	-0.07	0.0	3.0	18.2	--	--	
LFG-1							-	-	*Note 2*
LFG-2							-	-	*Note 2*
LFG-3							-	-	*Note 2*

General Data

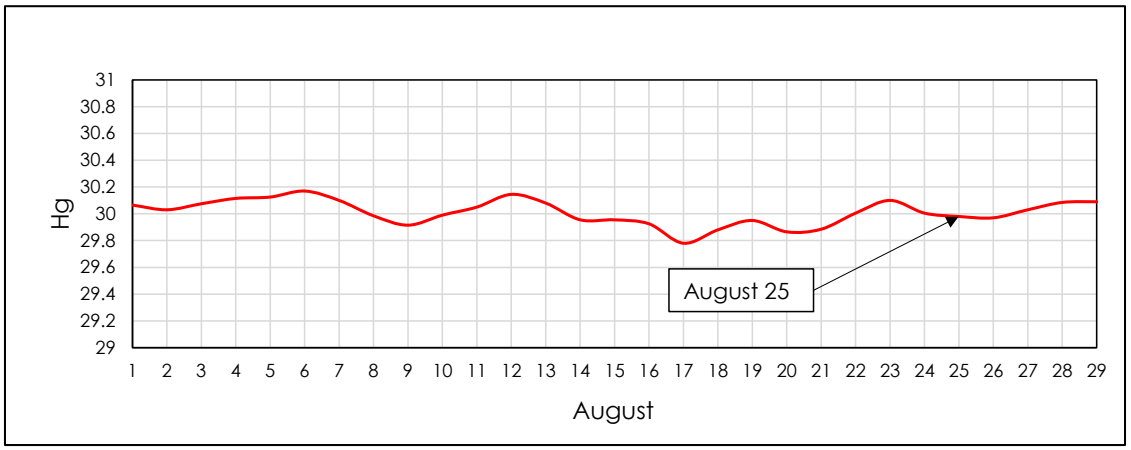
		Weather Conditions	
Monitored by:	A. Deszo	Sky Cover:	Cloudy
Instruments:	GEM 2000	Wind / Rain / Snow:	Drizzle
Calibration Date:	25-Aug-23	Temperature (°F):	68

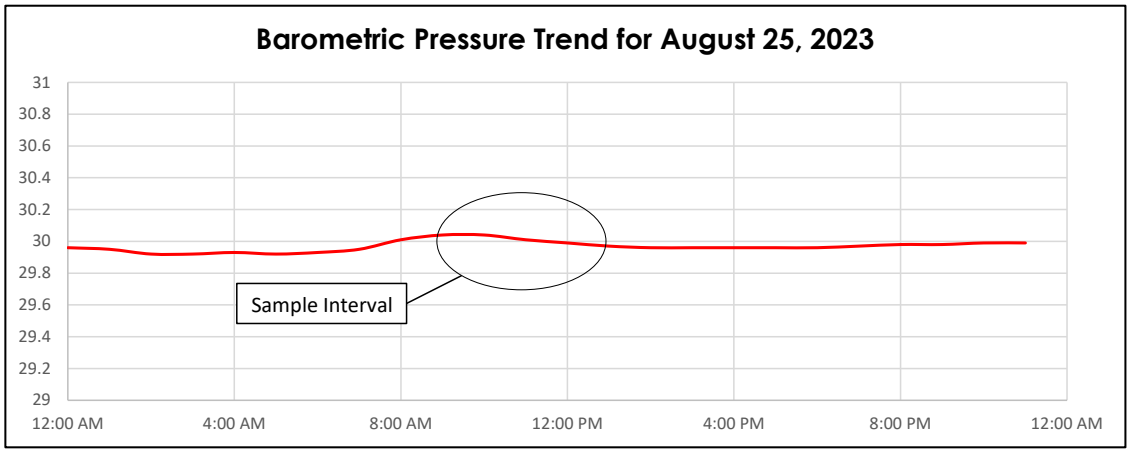
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not monitored. Probe casing rusted shut.
3. Extended stabilization period (240 seconds).

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend - August 2023
Hidden Valley Landfill, Pierce County, Washington





Monthly Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-08-25/2023-08-25/monthly

Daily Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-08-25/2023-08-25/daily

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

4223002.03

PCRCD dba LRI

September 30, 2023

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	21-Sep-23	11:25	0.03	0.0	5.5	6.5	--	--	
GP-1B	21-Sep-23	11:30	0.02	0.0	5.0	15.1	--	--	
GP-1C	21-Sep-23	11:34	0.01	0.0	1.6	19.2	--	--	
GP-2A	21-Sep-23	11:40	0.04	0.0	0.8	19.3	--	--	
GP-2B	21-Sep-23	11:45	-0.01	0.0	0.1	20.6	--	--	
GP-3S	21-Sep-23	11:50	-0.02	0.0	0.9	20.0	--	--	
GP-3M	21-Sep-23	11:55	0.00	0.0	3.9	17.2	--	--	
GP-3D	21-Sep-23	11:59	-0.02	0.0	2.7	19.1	--	--	
GP-4A	21-Sep-23	12:05	-0.01	0.0	4.0	17.5	--	--	
GP-4B	21-Sep-23	12:10	0.00	0.0	0.7	20.6	--	--	
GP-5A	21-Sep-23	12:16	-0.02	0.0	1.3	19.0	--	--	
GP-5B	21-Sep-23	12:20	-0.03	0.0	0.7	19.4	--	--	
GP-6	21-Sep-23	12:25	-0.04	0.0	0.3	20.9	--	--	
GP-7S	21-Sep-23	12:31	-0.06	0.0	0.7	20.6	--	--	
GP-7D	21-Sep-23	12:36	-0.06	0.0	0.4	20.5	--	--	
GP-8A	21-Sep-23	12:44	-0.04	0.0	6.5	14.3	--	--	
GP-8B	21-Sep-23	12:48	-0.05	0.0	4.9	16.1	--	--	
GP-9	21-Sep-23	12:55	-0.06	0.0	3.8	10.5	--	--	
GP-10	21-Sep-23	13:01	-0.07	0.0	1.1	19.5	--	--	
GP-11	21-Sep-23	13:08	-0.08	0.0	1.0	19.7	--	--	
GP-12	21-Sep-23	13:14	-0.08	0.0	4.7	15.5	--	--	
GP-13A	30-Sep-23	16:10	0.00	0.0	8.5	8.8	--	--	
GP-13B	21-Sep-23	13:27	-0.05	0.0	0.3	20.5	--	--	
GP-14S	21-Sep-23	13:33	-0.10	0.0	3.8	17.2	--	--	
GP-14D	21-Sep-23	13:37	-0.11	0.0	4.0	10.8	--	--	
GP-15A	21-Sep-23	13:43	-0.11	0.0	2.7	18.2	--	--	
GP-15B	21-Sep-23	13:49	-0.13	0.0	5.7	14.8	--	--	
GP-16A	21-Sep-23	13:57	-0.11	0.0	2.1	17.4	--	--	
GP-16B	21-Sep-23	14:02	-0.11	0.0	2.1	17.5	--	--	
GP-17	21-Sep-23	14:16	-0.09	0.0	7.1	8.8	--	--	
GP-18	21-Sep-23	14:21	-0.08	0.0	11.5	5.6	--	--	
GP-19	30-Sep-23	16:23	-0.01	0.0	1.0	19.5	--	--	
LFG-1							-	-	*Note 2*
LFG-2							-	-	*Note 2*
LFG-3							-	-	*Note 2*

General Data

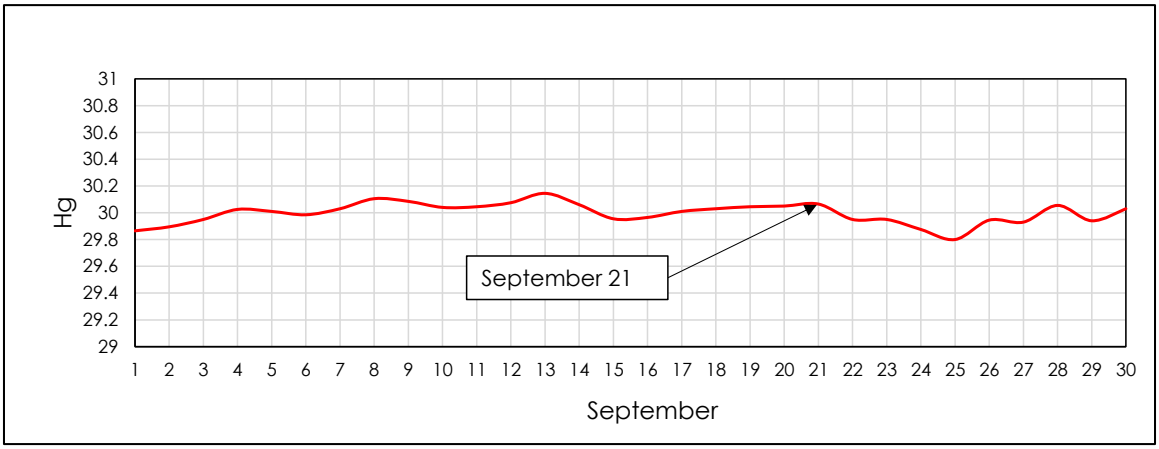
		Weather Conditions	
Monitored by:	A. Deszo	Sky Cover:	Partly Cloudy
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	21-Sep-23	Temperature (^{o}F):	64

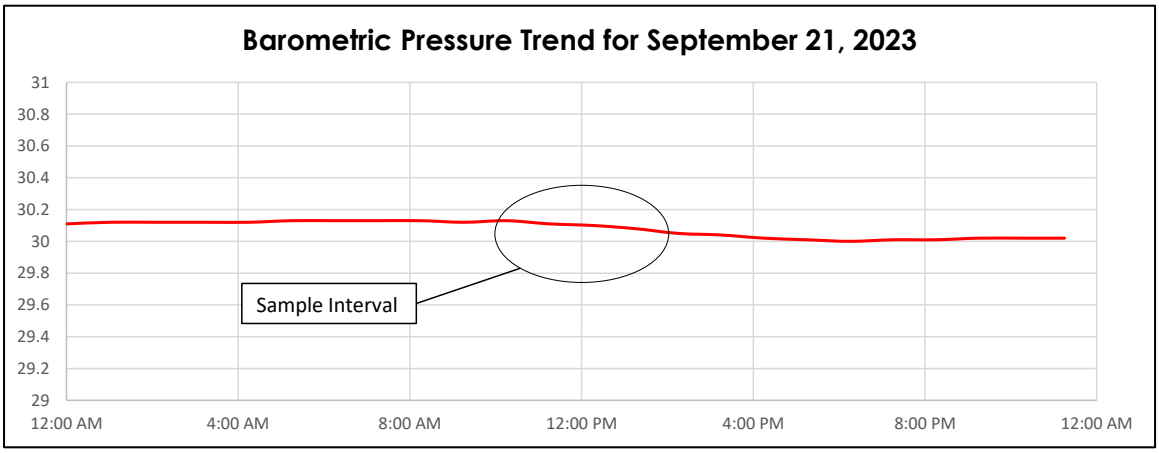
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not monitored. Probe casing rusted shut.
3. Extended stabilization period (240 seconds).

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend - September 2023
Hidden Valley Landfill, Pierce County, Washington





Monthly Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-09-21/2023-09-21/daily

Daily Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-09-21/2023-09-21/monthly

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

4223002.03

PCRCD dba LRI

October 18, 2023

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Exhibot created from field notes — Other
Gas Probes									
GP-1A	18-Oct-23	0:00	0.05	0.0	5.5	5.7	--	--	
GP-1B	18-Oct-23	0:00	0.02	0.0	5.5	14.1	--	--	
GP-1C	18-Oct-23	0:00	0.02	0.0	2.3	18.0	--	--	
GP-2A	18-Oct-23	0:00	0.02	0.0	1.3	18.5	--	--	
GP-2B	18-Oct-23	0:00	0.05	0.0	0.2	20.8	--	--	
GP-3S	18-Oct-23	0:00	0.00	0.0	1.5	19.4	--	--	
GP-3M	18-Oct-23	0:00	0.00	0.0	2.7	17.6	--	--	
GP-3D	18-Oct-23	0:00	0.00	0.0	3.1	16.8	--	--	
GP-4A	18-Oct-23	0:00	0.00	0.0	6.1	9.6	--	--	
GP-4B	18-Oct-23	0:00	0.00	0.0	0.6	19.8	--	--	
GP-5A	18-Oct-23	0:00	-0.02	0.0	1.2	19.1	--	--	
GP-5B	18-Oct-23	0:00	-0.02	0.0	1.0	18.1	--	--	
GP-6	18-Oct-23	0:00	-0.04	0.0	0.3	20.3	--	--	
GP-7S	18-Oct-23	0:00	-0.04	0.0	0.9	19.8	--	--	
GP-7D	18-Oct-23	0:00	-0.06	0.0	0.7	19.8	--	--	
GP-8A	18-Oct-23	0:00	-0.04	0.0	7.7	11.5	--	--	
GP-8B	18-Oct-23	0:00	-0.05	0.0	4.9	14.9	--	--	
GP-9	18-Oct-23	0:00	-0.04	0.0	4.8	10.7	--	--	
GP-10	18-Oct-23	0:00	-0.06	0.0	1.1	18.6	--	--	
GP-11	18-Oct-23	0:00	-0.06	0.0	1.3	18.9	--	--	
GP-12	18-Oct-23	0:00	-0.07	0.0	5.9	9.4	--	--	
GP-13A	18-Oct-23	0:00	-0.13	2.2	13.7	0.9	--	--	
GP-13B	18-Oct-23	0:00	0.08	0.0	0.5	19.7	--	--	
GP-14S	18-Oct-23	0:00	-0.08	0.0	3.4	16.4	--	--	
GP-14D	18-Oct-23	0:00	-0.09	0.0	3.9	10.7	--	--	
GP-15A	18-Oct-23	0:00	-0.11	0.0	2.6	16.9	--	--	
GP-15B	18-Oct-23	0:00	-0.12	0.0	7.6	8.9	--	--	
GP-16A	18-Oct-23	0:00	-0.11	0.0	1.9	17.4	--	--	
GP-16B	18-Oct-23	0:00	0.07	0.0	1.9	17.5	--	--	
GP-17	18-Oct-23	0:00	-0.12	0.0	6.2	12.3	--	--	
GP-18	18-Oct-23	0:00	-0.08	0.0	7.7	13.6	--	--	
GP-19	18-Oct-23	0:00	-0.04	0.0	2.8	17.8	--	--	
LFG-1							-	-	*Note 2*
LFG-2							-	-	*Note 2*
LFG-3							-	-	*Note 2*

General Data

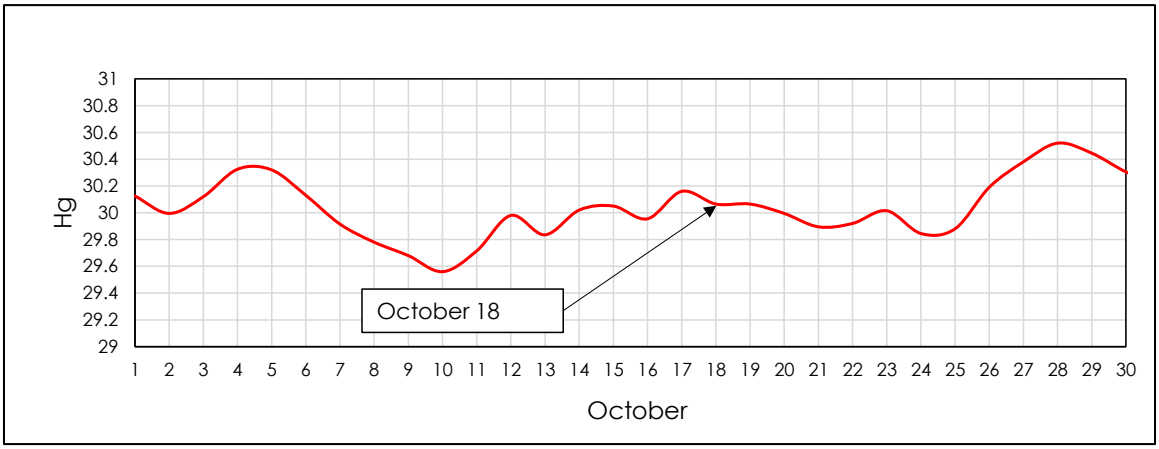
		Weather Conditions	
Monitored by:	A. Deszo	Sky Cover:	Partly Cloudy
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	18-Oct-23	Temperature (^{o}F):	63

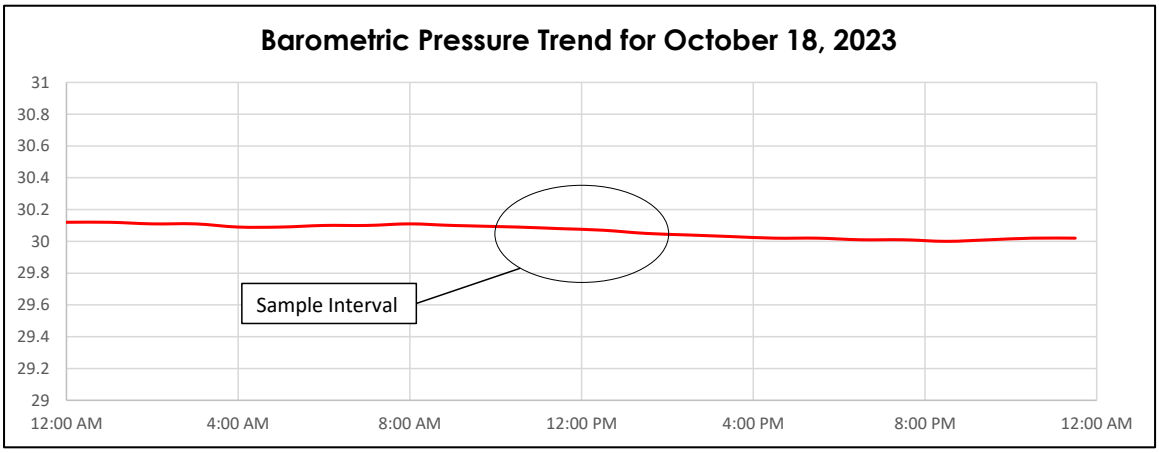
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not monitored. Probe casing rusted shut.
3. Extended stabilization period (240 seconds).

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend - October 2023
Hidden Valley Landfill, Pierce County, Washington





Monthly Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-10-18/2023-10-18/daily

Daily Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-10-18/2023-10-18/monthly

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

4223002.03

PCRCD dba LRI

November 16, 2023

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Other
Gas Probes								
GP-1A	16-Nov-23	12:44	0.17	0.0	4.9	8.9	-	
GP-1B	16-Nov-23	12:47	0.10	0.0	5.5	14.9	-	
GP-1C	16-Nov-23	12:50	0.10	0.0	4.5	15.5	-	
GP-2A	16-Nov-23	12:56	0.14	1.2	11.3	6.1	1.2	
GP-2B	16-Nov-23	13:00	0.15	0.0	0.4	21.2	-	
GP-3S	16-Nov-23	13:04	0.15	0.0	1.9	19.4	-	
GP-3M	16-Nov-23	13:07	0.14	0.0	4.1	11.6	-	
GP-3D	16-Nov-23	13:11	0.14	0.0	4.2	11.4	-	
GP-4A	16-Nov-23	13:17	0.13	0.0	0.4	20.9	-	
GP-4B	16-Nov-23	13:20	0.13	0.0	0.5	20.6	-	
GP-5A	16-Nov-23	13:25	0.11	0.0	0.1	21.1	-	
GP-5B	16-Nov-23	13:28	0.03	0.0	0.2	20.6	-	
GP-6	16-Nov-23	13:36	0.12	0.0	0.1	20.9	-	
GP-7S	16-Nov-23	13:42	0.10	0.0	0.3	20.8	-	
GP-7D	16-Nov-23	13:45	0.05	0.0	0.3	20.7	-	
GP-8A	16-Nov-23	11:12	0.20	0.0	6.3	14.9	-	
GP-8B	16-Nov-23	11:15	-0.03	0.0	0.7	20.7	-	
GP-9	16-Nov-23	11:19	0.13	0.0	4.5	12.9	-	
GP-10	16-Nov-23	11:26	0.27	0.0	0.4	20.9	-	
GP-11	16-Nov-23	11:31	-0.06	0.0	2.2	17.8	-	
GP-12	16-Nov-23	11:37	0.14	0.0	3.5	15.9	-	
GP-13A	16-Nov-23	11:41	0.14	0.0	0.2	21.0	-	
GP-13B	16-Nov-23	11:44	0.09	0.0	0.1	21.1	-	
GP-14S	16-Nov-23	11:49	0.18	0.0	4.2	16.4	-	
GP-14D	16-Nov-23	11:52	0.13	0.0	4.3	11.1	-	
GP-15A	16-Nov-23	12:03	0.13	0.0	2.9	15.8	-	
GP-15B	16-Nov-23	12:06	0.00	0.0	10.8	4.5	-	
GP-16A	16-Nov-23	12:12	0.09	0.0	1.2	19.8	-	
GP-16B	16-Nov-23	12:15	0.03	0.0	1.0	20.0	-	
GP-17	16-Nov-23	12:21	0.37	0.0	4.2	17.4	-	
GP-18	16-Nov-23	12:26	0.13	0.0	1.3	20.3	-	
GP-19	16-Nov-23	12:32	0.15	0.0	0.2	21.5	-	
LFG-1							-	*Note 2*
LFG-2							-	*Note 2*
LFG-3							-	*Note 2*

General Data

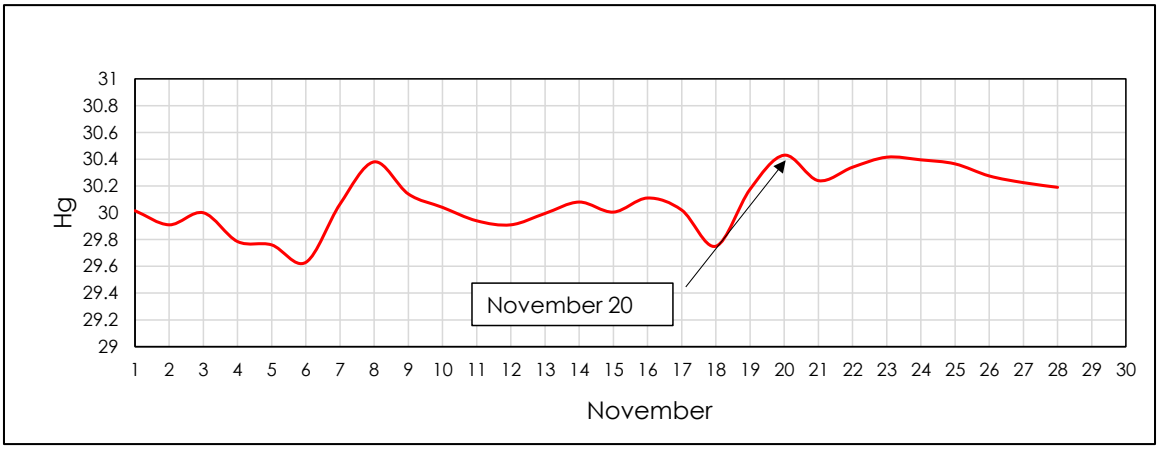
		Weather Conditions	
Monitored by:	T.Hanrahan	Sky Cover:	
Instruments:	GEM 2000	Wind / Rain / Snow:	
Calibration Date:	16-Nov-23	Temperature (°F):	

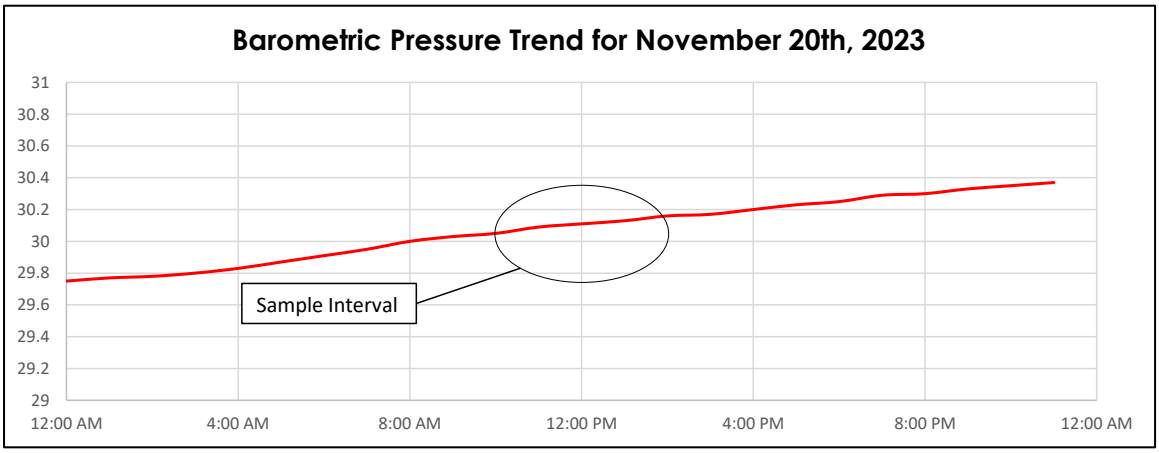
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not monitored. Probe casing rusted shut.

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend - November 2023
Hidden Valley Landfill, Pierce County, Washington





Monthly Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-11-20/2023-11-20/daily

Daily Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-11-20/2023-11-20/monthly

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

4223002.03

PCRCD dba LRI

December 19, 2023

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Other
Gas Probes								
GP-1A	19-Dec-23	8:32	0.43	0.0	5.5	9.1	-	
GP-1B	19-Dec-23	8:35	0.16	0.0	5.1	15.4	-	
GP-1C	19-Dec-23	8:39	0.11	0.0	7.2	11.4	-	
GP-2A	19-Dec-23	8:44	0.13	1.5	11.9	6.0	1.5	
GP-2B	19-Dec-23	8:47	0.16	0.0	0.4	21.2	-	
GP-3S	19-Dec-23	8:53	0.17	0.0	4.3	13.9	-	
GP-3M	19-Dec-23	8:56	0.15	0.0	5.1	8.9	-	
GP-3D	19-Dec-23	9:00	0.07	0.0	5.6	10.2	-	
GP-4A	19-Dec-23	9:06	0.14	0.0	0.4	21.1	-	
GP-4B	19-Dec-23	9:06	-1.68	0.0	0.5	21.1	-	
GP-5A	19-Dec-23	9:10	0.14	0.0	0.2	21.4	-	
GP-5B	19-Dec-23	9:16	0.14	0.0	0.1	21.4	-	
GP-6	19-Dec-23	9:19	0.01	0.0	0.1	21.5	-	
GP-7S	19-Dec-23	9:25	0.14	0.0	0.1	21.4	-	
GP-7D	19-Dec-23	9:31	0.15	0.0	0.2	21.3	-	
GP-8A	19-Dec-23	9:36	0.15	0.0	0.1	21.5	-	
GP-8B	19-Dec-23	9:46	0.15	0.0	4.9	13.5	-	
GP-9	19-Dec-23	9:49	0.04	0.0	1.9	16.4	-	
GP-10	19-Dec-23	9:54	0.15	0.0	4.3	14.0	-	
GP-11	19-Dec-23	10:01	0.15	0.0	0.2	21.2	-	
GP-12	19-Dec-23	10:09	0.10	0.0	3.3	15.2	-	
GP-13A	19-Dec-23	10:18	0.15	0.0	2.8	15.3	-	
GP-13B	19-Dec-23	10:24	0.15	0.0	0.1	21.4	-	
GP-14S	19-Dec-23	10:28	0.15	0.0	0.0	21.4	-	
GP-14D	19-Dec-23	10:34	0.14	0.0	3.2	17.7	-	
GP-15A	19-Dec-23	10:37	0.14	0.0	4.6	10.4	-	
GP-15B	19-Dec-23	10:43	0.15	0.0	4.8	4.9	-	
GP-16A	19-Dec-23	10:46	-0.03	0.1	13.1	0.2	0.1	
GP-16B	19-Dec-23	10:56	0.00	0.0	1.2	19.4	-	
GP-17	19-Dec-23	10:59	0.14	0.0	0.5	20.7	-	
GP-18	19-Dec-23	11:07	-0.05	0.0	2.6	19.5	-	
GP-19	19-Dec-23	11:13	0.41	0.0	1.6	19.4	-	
LFG-1							-	*Note 2*
LFG-2							-	*Note 2*
LFG-3							-	*Note 2*

General Data

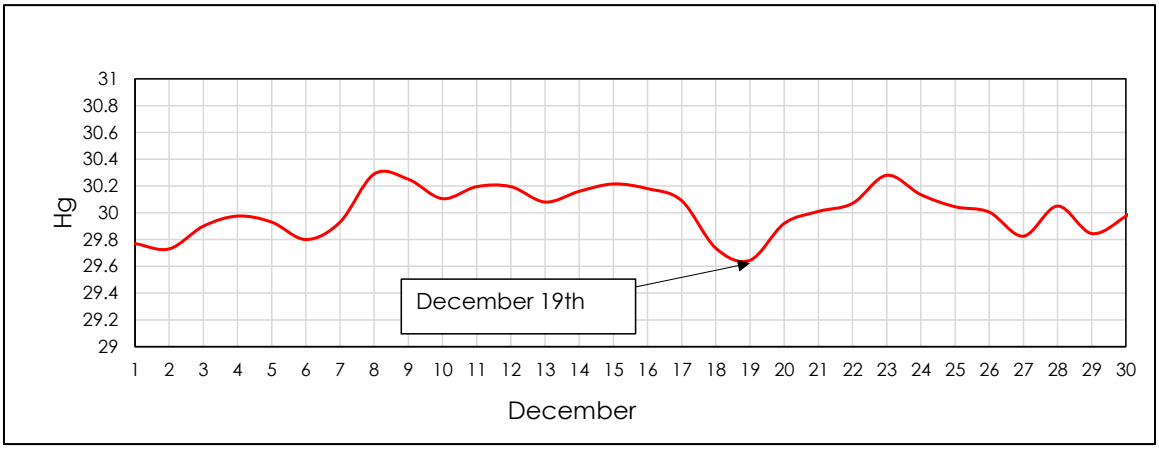
		Weather Conditions	
Monitored by:	T.Hanrahan	Sky Cover:	
Instruments:	GEM 2000	Wind / Rain / Snow:	
Calibration Date:	19-Dec-23	Temperature (^{o}F):	

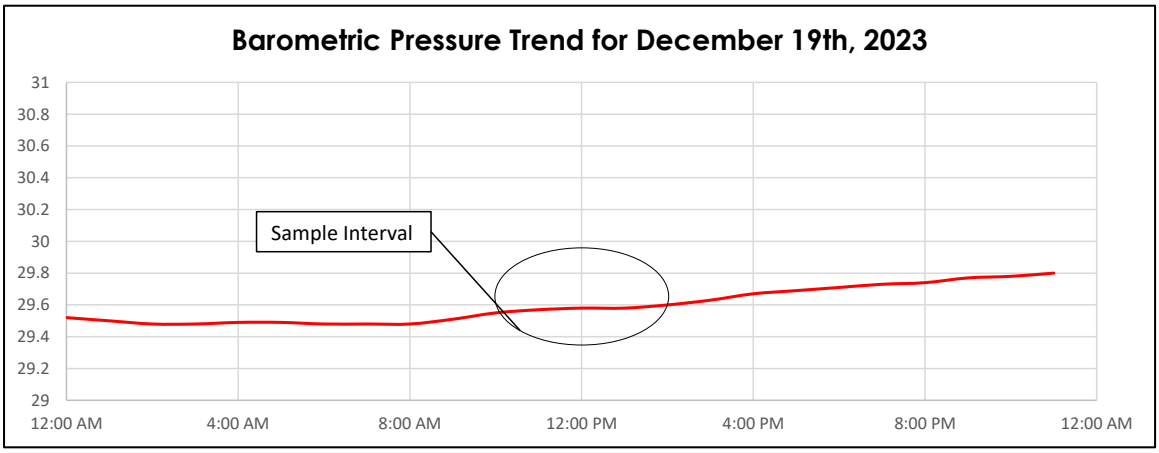
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not monitored. Probe casing rusted shut.

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend - December 2023
Hidden Valley Landfill, Pierce County, Washington





Monthly Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-12-19/2023-12-19/daily

Daily Data Source: Wunderground.com (South Hill, WA)
Lat: 47.10 Long: 122.27 Elev: 561 ft-AMSL
Data Source:
https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-12-19/2023-12-19/monthly

Hidden Valley Landfill
Landfill Gas Monitoring of On-site Buildings

Date: 3-23-23
Weather Conditions: Rain + Wind
Instrument: MicroFID
Measured By: JTF

The atmosphere inside buildings at the landfill were monitored for possible intrusion of methane gas. Per WAC 173-351, concentrations of methane in on-site structures must not exceed 25% of the lower explosive limit (LEL). If off-site gas migration is suspected, concentrations of methane in off-site structures must not exceed 100 ppm methane.

The areas monitored included:
- The general overall work area
- Floor drains
- Underground conduit protrusions
- Closed areas where landfill gas could collect, such as under cupboards and inside closets

The gas detection instrument must be calibrated using calibration gas containing methane equal to 50 % LEL. Calibration must be performed before and after the survey is completed.

Checked boxes indicate that the survey revealed **no detectable methane**.

- [x] Main Office - individual office spaces, storage areas and within open crawl-space area.
- [x] Repair Shop – survey atmosphere conditions throughout (lower height levels).
- [x] Pay/Scale Booth – interior of building.
- [x] Recycle Building – throughout facility and water drainage areas.
- [x] Leachate Treatment Building – all lower level office spaces, restrooms, water drainage system and storage/equipment areas.
- [x] Gas to Energy Building – central monitoring/control room, engine room and storage cabinets.
- [x] Transfer Station Building – throughout entire building and lower levels.

Signature

Hidden Valley Landfill
Landfill Gas Monitoring of On-site Buildings

Date: 5-31-23
Weather Conditions: overcast, 55°F
Instrument: Micro Fid
Measured By: JTF

The atmosphere inside buildings at the landfill were monitored for possible intrusion of methane gas. Per WAC 173-351, concentrations of methane in on-site structures must not exceed 25% of the lower explosive limit (LEL). If off-site gas migration is suspected, concentrations of methane in off-site structures must not exceed 100 ppm methane.

The areas monitored included:
- The general overall work area
- Floor drains
- Underground conduit protrusions
- Closed areas where landfill gas could collect, such as under cupboards and inside closets

The gas detection instrument must be calibrated using calibration gas containing methane equal to 50 % LEL. Calibration must be performed before and after the survey is completed.

Checked boxes indicate that the survey revealed **no detectable methane**.

- [x] Main Office - individual office spaces, storage areas and within open crawl-space area.
- [x] Repair Shop – survey atmosphere conditions throughout (lower height levels).
- [ ] Pay/Scale Booth – interior of building. 0.3 ppm max
- [x] Recycle Building – throughout facility and water drainage areas.
- [x] Leachate Treatment Building – all lower level office spaces, restrooms, water drainage system and storage/equipment areas.
- [x] Gas to Energy Building – central monitoring/control room, engine room and storage cabinets.
- [x] Transfer Station Building – throughout entire building and lower levels.

Signature

Hidden Valley Landfill
Landfill Gas Monitoring of On-site Buildings

Date: 9-27-23
Weather Conditions: overcast
Instrument: Micro FID
Measured By: JTF

The atmosphere inside buildings at the landfill were monitored for possible intrusion of methane gas. Per WAC 173-351, concentrations of methane in on-site structures must not exceed 25% of the lower explosive limit (LEL). If off-site gas migration is suspected, concentrations of methane in off-site structures must not exceed 100 ppm methane.

The areas monitored included:
- The general overall work area
- Floor drains
- Underground conduit protrusions
- Closed areas where landfill gas could collect, such as under cupboards and inside closets

The gas detection instrument must be calibrated using calibration gas containing methane equal to 50 % LEL. Calibration must be performed before and after the survey is completed.

Checked boxes indicate that the survey revealed **no detectable methane**.

- 1,2 avg* 4,0 max* ☑ Main Office - individual office spaces, storage areas and within open crawl-space area.
- ☑ Repair Shop – survey atmosphere conditions throughout (lower height levels).
- 0 ☑ Pay/Scale Booth – interior of building.
- 0 ☑ Recycle Building – throughout facility and water drainage areas.
- 0 ☑ Leachate Treatment Building – all lower level office spaces, restrooms, water drainage system and storage/equipment areas.
- 0 ☑ Gas to Energy Building – central monitoring/control room, engine room and storage cabinets.
- 0 ☑ Transfer Station Building – throughout entire building and lower levels.

* These readings are suspected to be false positives given while Micro FID "warming up".

Signature

Hidden Valley Landfill
Landfill Gas Monitoring of On-site Buildings

Date: 11-15-23
Weather Conditions: overcast
Instrument: Micro FID
Measured By: JTF

The atmosphere inside buildings at the landfill were monitored for possible intrusion of methane gas. Per WAC 173-351, concentrations of methane in on-site structures must not exceed 25% of the lower explosive limit (LEL). If off-site gas migration is suspected, concentrations of methane in off-site structures must not exceed 100 ppm methane.

The areas monitored included:
- The general overall work area
- Floor drains
- Underground conduit protrusions
- Closed areas where landfill gas could collect, such as under cupboards and inside closets

The gas detection instrument must be calibrated using calibration gas containing methane equal to 50 % LEL. Calibration must be performed before and after the survey is completed.

Checked boxes indicate that the survey revealed **no detectable methane**.

- 3.4 ppm ☐ Main Office - individual office spaces, storage areas and within open crawl-space area.
- 2.6 ppm ☐ Repair Shop – survey atmosphere conditions throughout (lower height levels).
- 2.6 ppm ☐ Pay/Scale Booth – interior of building.
- 1.6 ppm ☐ Recycle Building – throughout facility and water drainage areas.
- 1.4 ppm ☐ Leachate Treatment Building – all lower level office spaces, restrooms, water drainage system and storage/equipment areas.
- 1.4 ppm ☐ Gas to Energy Building – central monitoring/control room, engine room and storage cabinets.
- 1.6 ppm ☐ Transfer Station Building – throughout entire building and lower levels.

Max

Signature

Appendix B

LEACHATE TREATMENT &

SIDE-SLOPE LINER SYSTEM DATA

Table 1. 2023 Main Sump and Side-Slope Liner Area Performance Data
Semi - Annual Monitoring Event No. 2 - July 2023
Hidden Valley Landfill, Pierce County, Washington

Month	Main Sump Monthly Leachate Volume - Cell 1 (gallons)	Side-Slope Sump Monthly Leachate Volume - Cell 2 (gallons)	Side-Slope Sump Monthly Leakage Flow[a] - Cell 2 (gallons/month)	Monthly Rainfall (inches)
January	13,521	698	0	4.85
February	12,123	952	0	6.00
March	7,827	11	0	5.20
April	11,547	0	0	9.35
May	18,929	0	0	1.85
June	6,706	0	0	2.80
July	1,790	0	0	0.20
August	3,077	0	0	0.35
September	11,908	0	0	3.80
October	3,397	0	0	5.10
November	1,270	0	0	6.58
December	10,160	0	0	14.35
Year to date:	102,255	1,661	0	60.43

Notes:

a = Leakage is fluid pumped from the leak detection sump as recorded by LRI staff.

LEACHATE DAILY LOG #2

Month: JAN. 2023
Year:

Date	Time	P15A		P15B	AC HRS	D AP	RAIN	L8 LVL	GP HRS	S SL	CELL1	TS/GL	TRAN P	BLW A/B	E PH	DAILY EFFLUENT
1		2379	22	195	88730		0	23.6	19339	151800	1190095	436223	1534	48582	735	61617
2		2401	22		88754		.0	23.6	19342	"	"	"	1641	48604	743	61617
3		2423	22		88780		.2	23.9	19349	151800	1190095	436231	15.74	48626	7.24	61617
4		2429	22		88806		.2	23.9	19357	151800	1192626	436246	15.74	48634	6.96	61616
5			20	235	88832		.35	23.5	19357	151800	1192626	436251	15.92	48675	7.15	61616
6			22	255	88848		.2	23.2	19374	"	1193959	436300	1533	48694	732	61616
7			22	277	88872		.3	23.2	19379	"	1196715	"	1540	48717	730	61616
8		2434	22	293	88896		.25	23.1	19384	"	"	"	1634	48739	745	61616
9		2456	22		88920		.2	23.1	19389	"	"	"	1613	48762	740	61616
10		2478	22		88945		.0	23.1	19397	151800	1196716	436311	15.90	48785	7.17	61616
11		2500	22		88967		.2	23.2	19405	151800	1196715	436371	15.51	48806	7.06	61616
12		2526	22		88998		.65	23.2	19405	151800	1196715	436526	15.51	48812	7.03	61617
13			22	310	89015		.3	23.2	19422	"	"	438255	1611	48852	748	61617
14			22	332	89039		.25	23.3	19427	"	"	438863	1590	48874	737	61617
15			22	354	89063		.35	23.4	19431	"	"	439192	1609	48897	741	61617
16			20	376	89087		.2	23.6	19438	"	"	439341	1564	48919	757	61617
17		2536	21	391	89100		.2	23.7	19438	152498	1196715	439353	15.68	48919	6.88	55844
18		2552	22				.4	234	19454	152498	1198264	439386	16.39	48964	7.15	61616
19		2574	22		89158		0	23.1	19460	"	1201016	"	1544	48987	7	61617
20		2596	22		89182		0	23.3	19466	"	"	"	1548	49009	767	61616
21		2618	21		89206		.4	23.4	19472	"	"	"	1633	49032	751	61617
22		2624	22	406	89230		.1	23.5	19484	"	1201016	"	1581	49054	744	61617
23		2642	23	410	89254		.2	23.5	19490	"	"	439885	1548	49077	694	61617
24			21	433	89275		.0	23.5	19495	152498	1201016	439885	15.86	49077	6.84	61616
25			22	454	89295		0		19504	152498	1203616	439896		49122	7.05	61616
26			22	476	89323		0	23.1	19510	"	"	"	1584	49143	716	61617
27		2651	22	489	89357		.20	23.1	19521	"	"	"	1634	49165	742	61617
28		2673	21		89381		0	23.1	19527	"	"	440164	1589	49188	741	61617
29		2694	23		89405		.0	23.4	19533	"	"	"	1624	49210	738	61617
30		2717	23		89429		.0	23.3	19533	"	"	"	1591	49233	725	61617
31		2740	22	490.09 22	89450		.0	23.6	19533	152498	1203616	440164	15.82	49233	7.21	61617
				509					19545							

LEACHATE DAILY LOG #2

Month: Feburary 23
Year:

Date	Time	INFLUENT FM 212	EFFLUENT FM 511		AC HRS	D-AP	RAIN	L8 LVL	GP HRS	S-SL	CELL1	TS/GL	TRAN P	BLW A/B	E-PH	DAILY EFFLUENT
1		2740	509	22	89475		Ø	23.6	19545	152493	1203616	440164	15.32	49277	7.16	61617
2			531	22	89498		0	23.6	19544	152498	1203616	440164	15.32	49277	7.05	61617
3			553	21	89522		0	23.7	19566	"	"	"	16 38	49313	727	61617
4			574	23	89535		.3	23.6	19573	"	1207534	"	1610	"	726	61617
5		2750	587	23	895 59		0	23	19579	"	"	"	1634	"	722	61617
6		2772		22	895 83		.2	23.2	19579	"	"	"	1644	"	760	61617
7		2794		21	89605		.8	23.3	19589	152498	1207534	440165	15.67	49313	706	61617
8		2815		22	89640		.0	23.3	19602	152498	1207534	441411	15.68	OFF	723	61617
9		2837		23	89666		.4	23.3	19609	152498	1207534	441707	16.32	OFF	7.11	61616
10		2838	608	22	89680		.2	23.3	19609	152498	1207534	441864	15.70		7.02	61616
11			630	24	89714		.4	23.6	19627	152498	1207534	442105	15.85		6.86	61617
12			654	19	89740		.8	23.6	19639	152498	1207534	442149	15.85		706	61616
13			673	22	89762		0	23.6	19639	152498	1207534	442149	15.85		729	61617
14		28489	685	22	89784		0	23.8	19656	152498	1207534	442375	15.63		7.16	61617
15		2871		21	89810		1.35	23.8	19662	152498	1207534	442536			6.99	61617
16		2892		22	89827		0	23.9	19668	"	"	442587	1626		705	61617
17		2914		22	898 51		.20	23.8	19679	"	"	"	1610		707	61617
18		2936		22	898 75		.35	23.1	19688	153450	1210627	"	1615		732	61616
19			707	22	898 99		0	23.2	19692	"	"	"	1623		736	61617
20			729	21	899 23		0	23.2	19697	"	"	"	1591		714	61616
21			750	23	899 53		0	23.4	19697	153450	1210627	442587	16.42		7.09	61617
22			773	20	899 77		.4	22.8	19709	153450	1210627	442587	15.69		6.81	61616
23		2947	783	21	89995		0	23.3	19717	"	1212248	"	1587		693	61617
24		2970		21	90019		0	23.5	19729	"	"	"	1556		695	61616
25		2991		22	900 43		0	22.5	19729	"	1215739	"	1549		686	61616
26		3013		22	900 67		.4	22.8	19741	"	"	"	1649		693	61617
27		3034	784	22	900 91		.0	23	19741	"	"	"	1631		733	61617
28			806	21	901 15		.2	22.9	19741	153450	1215739	442587	15.47		7.14	61616
29			~~827~~				~~.2~~	~~22.9~~	~~19741~~	~~153450~~	~~1215739~~	~~442587~~	~~15.47~~		7.19	
30																
31																

LEACHATE DAILY LOG #2

Month: MARCH
Year: 2023

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC HRS	D-AP	RAIN	L8 LVL	GP HRS	S SL	CELL1	TS/GL	TRAN P	BLW A/B	E-PH	DAILY EFFLUENT
1			827 22	90145		.2	22.9	19741	153739	1215739	441387	15.47	BOTH	7.14	61616
2		3034	854 22	90169		.4	23.0	19758	153739	1215739	442537	1645	off	7.22	61616
3			871 22	90187		.25	23.1	19772	"	"	"	1633		6.85	61617
4		3046	881 22	90201		.05	23.2	"	"	"	"	1644		6.80	61617
5		3068	22	90225		.25	23.3	19779	"	"	"	1588		685	61617
6		3096	20	90249		.4	23.3	"	"	"	"	1590		676	61617
7		3110	22	90275		.2	23.3	19779	153739	1215739	443241	1590		657	61617
8		3132	883 21	90300		.4	23.3	19790	153739	1215739	443516	1590		6.39	61616
9			904 22	90337		.25	23.5	19790	153739	1215739	443419	16.18		757	61616
10			926 22	90354		.2	23.5	19807	"	"	443815	1616		698	61617
11			948 22	90378		.1	23.6	"	"	"	444047	1605		673	61617
12			970 22	90402		.25	23.6	19824	"	"	444143	1635		646	61617
13		3145	979 22	90426		.2	23.5	19824	"	"	444308	1616		673	61617
14		3167	22	90450		0	23.7	19841	153750	1215739	446432	15.55		6.77	61617
15		3189	22	90474		1.1	23.7	19841	153750	1215739	446538	15.55		6.63	61617
16		3211	22	90497		0	23.3	"	"	1219066	"	1592		6.56	61617
17		3230	981 22	90521		0	23.4	19857	"	"	"	1594		650	61617
18			1003 22	90545		0	23.3	"	"	"	"	1576		655	61617
19			1025 22	90569		.1	"	"	"	"	"	1571		639	61617
20			1047 22	90593		.8	23.4	19875	"	"	"	1594		654	61616
21			1069 22	90617		.0	23.4	19875	153750	1219066	446538	1544		659	61617
22		3244	1077 22	90641		.3		19875	153750	1219066	447231	15.49		6.81	61617
23		3266	22	90664		0	23.4	19893	"	"	447387	1549		657	61617
24		3288	22	90688		0	"	"	"	"	447540	1591		626	61617
25		3310	21	90712		0	23.6	19906	"	"	"	1589		666	61616
26		3328	1080 22	90736		.15	23.6	"	"	"	447599	1598		698	61617
27			1102 22	90770		.2	23.7	19923	"	"	447648	1588		657	61617
28			1124 22	90790		.2	23.7	19923	153750	1219066	447830	15.88		6.47	61616
29			1148 23	90815		.0	23.8	19923	153750	1219066	448008	15.55		6.43	61617
30			1173 22	90839		0	23.8	19926	153750	1219066	448008	15.55		6.45	61617
31		3343	1175 22	90863		0	23	19947	153750	1223566	448009	1585		646	61617
		3365						19960							

LEACHATE DAILY LOG #2

Month: APRIL 2023
Year:

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC HRS	D AP	RAIN	L8 LVL	GP HRS	S SL	CELL1	TS/GL	TRAN P	BLW A/B	E PH	DAILY EFFLUENT
1	12	3365	1175	90879		.65	23.1	19960	153750	1223566	448009	1591	off	659	61617
2		3387		90903		.45	"	"	"	"	"	1600		616	61617
3		3409		90927		.4	23.2	"	"	"	448355	1584		624	61617
4		3426	1179	90951		.0	23.3	"	"	"	448687	1601		631	61617
5			1203	90972		.4	23.3	19960	153750	1223566	448793	16.01		6.71	61617
6			1227			.4	23.4		153750	1223566	448943	16.11		6.71	61617
7			1245	91023		.60	23.4	19977	"	"	449217	1587		612	61617
8			1267	91047		.20	"	19994	"	"	449597	1597		616	61617
9		3442	1273	91071		.85	23.5	"	"	"	449731	1610		618	61617
10		3464		91095		.8	"	"	"	"	450992	1531		645	61617
11		3486		91125		1.0	23.5	19994	153750	1223566	450074	1550		6.19	61617
12		3513		91150		.4	23.7	19994	153750	1223566	453074	15.64		6.14	61617
13		3524	1278	91167		0	23.4	19994	"	1226948	453348	1566		606	61617
14			1300	91191		0	23.6	20012	"	"	"	1591		605	61617
15			1322	91215		0	"	"	"	"	"	1601		609	61617
16			1344	91139		.4	"	20025	"	"	"	1606		6.27	61617
17		3545	1371	91265		.6	23.8	20033	153750	1226948	453348	15.49		6.29	61617
18		3563		91319		.0	23.9	20033	153750	1226948	453348	15.81		6.17	61617
19		3587				.4	23.9	20033	153750	1226948	453348	15.81		6.02	61616
20		3606				1.0	23.9	20033	153750	1226948	453348	15.91		6.09	61617
21		3622	1377	91383		.3	23.9	20033	"	"	"	1588		602	61617
22			1399	91407		.5	"	"	"	"	"	1618		610	61617
23			1421	91431		.0	23.9	20052	"	"	453589	1585		629	61617
24			1446	91460		.0	23.9	20052	153750	1228463	453703	1585		6.04	61617
25			1468	91486		.0	23.37	20052	153750	1228463	453703	1585		5.84	61617
26		3644	1469	91505		0	23.31	20052	153750	1228463	453703	15.85		6.10	61617
27		3661		91527		0	23	"	"	1233613	453795	1594		608	61617
28		3683		91551		0	22.6	"	"	1235173	"	1585		591	61617
29		3705		91575		0	22.7	"	"	"	453811	1590		597	61617
30		3727		91699		0	22.8	"	"	"	453811	1590		630	61617
31															

20052

Month: MAY

Year: 2023

LEACHATE DAILY LOG

Date	Time	P15A	P15B	AC HRS	RAIN	LB LVL	GP HRS	SSL	CELL	TS/GL	TRAN P	E-PH	DAILY EFFLUENT
1	12AM	3720	1476	91599	0	22.9	20052	153750	1235113	453811	15.94	5.99	61617
2	12AM		1502	91630	0	22.9	20052	"	"	"	"	5.97	61617
3	12AM		1524	91654	.2	23	"	"	"	"	"	611	61617
4	12AM		1546	91678	.2	"	"	"	"	453965	"	6.01	61617
5	12AM		1564	91694	.65	23.2	"	"	"	453988	15.84	5.97	61617
6	12AM	3738	1567	91718	.3	"	"	"	"	454042	15.89	5.94	61617
7	12AM	3760		91742	.05	"	"	"	"	"	15.74	5.95	61617
8	12AM	3782		91766	.2	"	"	"	"	454331	15.98	5.83	61617
9	12AM	3809		91780	0	22.6	"	"	1236860	454331	15.71	5.96	61617
10	12AM	3818	1578	91822	0	"	"	"	1238566	454738	"	5.95	61617
11	12AM		1597	91838	0	22.5	"	"	1239976	454919	15.84	5.99	61617
12	12AM		1618	91862	0	"	"	"	1241200	455000	15.88	5.95	61617
13	12AM		1640	91886	0	21.9	"	"	1242765	455038	15.20	565	61617
14	12AM		1662	91910	0	22	"	"	"	455079	1580	549	61616
15	12AM	3838	1665	91933	.2	21.9	"	"	"	455117	1578	575	61616
16	12AM	3863			.0	21.9	20069	153750	1244066	455485	15.78	5.65	61617
17	12AM	3885			0	21.9	20069	153750	1244066	455485	15.78	5.67	61617
18	12AM	3903		92004	0	21.7	20084	"	1245456	455827	1577	5.63	61617
19	12AM	3916		92028	0	21.7	20091	"	"	455877	1580	568	61617
20	12AM		1695	92052	.05	21.8	"	"	"	455995	1566	556	61617
21	12AM		1717	92076	0	21.9	"	"	"	456097	1548	584	61617
22	12AM		1739	92101	0	"	"	"	"	456162	1551	599	61617
23	12AM		1763	92128	0	21.6	20091	153750	1245456	456162	1551	583	61616
24	12AM	3936		92155	0	21.3	20091	153750	1245456	456162	15.51	5.85	61616
25	12AM	3962		92181	0	21.3		153750	1245456	456162	15.51	5.82	61616
26	12AM	3980		92197	0	20.6	"	"	1252367	456817	1573	556	61616
27	12AM	4002		92221	0	20.3	"	"	1254042	456917	1577	570	61617
28	12AM	4014	1772	92245	0	"	"	"	"	457031	1572	566	61616
29	12AM		1794	92269	0	20.5	"	"	"	457097	1591	581	61616
30	12AM		1816	92290	0	20.5	20091	153750	1254042	457097	15.91	5.85	61617
31	12AM		1840	92315	0	20.5	20091	153750	1254042	457097	15.91	5.84	61617

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Month: June 2023

LEACHATE DAILY LOG

Year: _____

Date	Time	P15A	P15B	AC HRS	RAIN	L8 LVL	GP HRS	S-SL	CELL	TS/GL	TRANP	E-PH	DAILY EFFLUENT
1	12AM	4018	1861	92746	0	20.7	20091	153750	1254042	45[illegible]	15.77	7.87	61617
2	12AM	4035		92366	0	20.8	"	"	"	"	1572	698	61617
3	12AM	4057		92390	0	"	"	"	"	457299	1578	663	61617
4	12AM	4079		92414	0	"	"	"	"	"	1554	677	61617
5	12AM	4101		92438	.0	20.9	"	"	"	457580	1558	654	61617
6	12AM	4112		92455	.0	20.9	20091	153750	1254042	457580	15.58	657	61617
7	12AM	4112	1898		0	20.9	20091	153750	1254042	457580	1558	618	61616
8	12AM		1915	92510	0	20.5	"	"	1255821	457659	1554	610	61616
9	12AM		1937	92534	.35	20.7	"	"	"	457714	1571	583	61617
10	12AM		1959	92558	.05	"	"	"	"	457772	1577	606	61616
11	12AM	4134		92582	0	"	"	"	"	"	1564	570	61617
12	12AM	4156		92606	.0	20.8	"	"	"	457819	1577	583	61617
13	12AM	4182		92640	.0	20.8	20091	153750	1255821	457819	15.77	593	61617
14	12AM	4202		92661	0	20.8	20091	153750	1255921	457819	15.77	7.64	61617
15	12AM	4210	1970	92680	0	21	"	"	"	457855	1564	768	61616
16	12AM		1992	92687	.45	20.7	"	"	1257121	"	1584	765	61617
17	12AM		2014	92688	.05	20.8	"	"	"	"	1594	762	61617
18	12AM		2036	92689	.70	20.9	"	"	"	"	1588	761	61617
19	12AM	4211	2057	92690	.8	"	"	"	"	"	1598	759	61617
20	12AM	4233		92691	.4	20.9	20091	153750	1257121	457858	15.98	7.68	61617
21	12AM	4257		92693	.0	21.0	20091	153750	1257121	457858	15.77	7.62	61617
22	12AM	4278		92693	.8	21.0	20091	153750	1257121	457858	15.91	7.55	61617
23	12AM	4300		92693	.0	21.1	20091	153750	1257121	457858	15.73	754	61617
24	12AM	4308	2069	92693	.0	21.1	20091	153750	1258371	457862	15.73	755	61617
25	12AM		2091	92693	.0	21.0	20091	153750	1258371	457862	15.72	754	61617
26	12AM		2115	92698	.0	21.0	20091	153750	1258371	457862	15.72	759	61617
27	12AM		2131	92698	.0	21.0	20091	153750	1258371	457863	15.72	762	61617
28	12AM		2155	92698	.0	21.0	20091	153750	1258371	457863	15.72	761	61617
29	12AM	4332		92698	0	20.8	20091	153750	1258371	457863	15.73	7.57	61617
30	12AM	4354		92701	0	20.6	20128	"	1260748	"	15.75	740	61617
31	12AM												

Month: July 2023

Year: _____

LEACHATE DAILY LOG

Date	Time	P15A	P15B	AC HRS	RAIN	L8 LVL	GP HRS	S-SL	CELL1	TS/GL	TRANP	E-PH	DAILY EFFLUENT
1	12AM	4376	2155	22702	0	20.4	20108	153750	1261948	457863	1579	741	61617
2	12AM	4397		22703	0	20.5	"	"	"	"	1588	746	61617
3	12AM	4406	2168	22704	.0	20.6	"	"	"	"	1576	7.49	61617
4	12AM		2190	92705	.0	20.6	20108	153750	1261948	457863	1576	7.52	61617
5	12AM		2216	92706	0	20.6	20108	153750	1261948	457863	15.76	751	61616
6	12AM		2234	92707	0	20.7	"	"	"	"	1575	752	61617
7	12AM	4409	2253	92708	0	20.8	"	"	"	"	1585	747	61617
8	12AM	4431		92709	0	"	"	"	"	"	1565	751	61616
9	12AM	4453		92710	0	20.9	"	"	"	"	1571	753	61617
10	12AM	4474		92711	.0	"	"	"	"	"	1549	754	61616
11	12AM	4496		92712	.0	20.7	20108	153750	1261948	457863	15.50	752	61616
12	12AM	4505	2267	92713	0	20.7	20108	153750	1261948	457863	1554	755	61617
13	12AM		2289	92714	0	20.8	20128	"	1262728	"	1559	754	61617
14	12AM		2311	92715	0	"	"	"	"	"	1557	752	61617
15	12AM		2332	92716	0	20.9	"	"	"	"	1577	749	61617
16	12AM	4508	2351	92717	0	"	"	"	"	"	1571	750	61617
17	12AM	4530		92718	.0	21	"	"	"	"	1574	754	61617
18	12AM	4551		92719	.0	21.1	20144	153750	1267728	457863	15.75	751	61616
19	12AM	4578		92720	.0	21.1	20152	153750	1267728	457863	15.75	753	61617
20	12AM	4587	2359	92721	0	21.1	20152	153750	1267728	457863	15.75	752	61616
21	12AM	4602	2366	92722	0	21.2	20164	"	1263738	"	1570	754	61617
22	12AM	4624		92723	0	21	20174	"	"	457929	1578	747	61617
23	12AM	4646		92726	0	21.1	20178	"	"	"	1569	752	61616
24	12AM	4668		92728	.2	21.2	20181	"	"	457946	1578	754	61617
25	12AM	4685	2373	92746	.0	21.7	20184	153750	1263738	457965	15.65	752	61617
26	12AM		2393	92767	.0	21.7	20184	153750	1263738	457965	15.65	755	61617
27	12AM		2419	92794	0	21.7	20184	153750	1263738	457965	15.65	748	61617
28	12AM		2436	92810	0	21.4	20184	"	"	457986	1580	752	61617
29	12AM		2458	92834	0	"	"	"	"	457990	1575	746	61617
30	12AM	4701	2464	92858	0	"	"	"	"	458009	1576	748	61617
31	12AM	4723		92882	.0	21.4	20184	153750	1263738	458009	1578	744	61617

Month: August

Year: 2023

LEACHATE DAILY LOG

Date	Time	P15A	P15B	AC-HRS	RAIN	L8 LVL	GP HRS	S.SL	CELL 1	TS/GL	TRANP	E-PH	DAILY EFFLUENT
1	12AM	4745	24.4	92906	.00	21.5	20184	153750	1263738	458014	15.78	7.44	61617
2	12AM	4771			0	21.5	20184	153750	1263738	458014	15.78	7.45	61616
3	12AM	4783	2469	92954	0	21.6	20184	"	"	458028	15 69	748	61616
4	12AM		2491	92978	0	21.2	"	"	1264798	458034	1562	747	61617
5	12AM		2513	93002	.05	21.3	"	"	"	458043	1575	746	61617
6	12AM		2535	93026	0	"	"	"	"	458054	1577	743	61617
7	12AM		2557	93050	.00	21.4	20201	"	"	"	1599	743	61617
8	12AM	4800	2562	93074	.00	21.5	20201	153750	1263738	458054	15.75	7.45	61617
9	12AM	4825		93105	0	21.5	20201	153750	1263738	458054	15.72	7.44	61616
10	12AM	4843		93122	0	21.6	20221	"	1264798	458065	1525	746	61617
11	12AM	4865		93145	0	21.7	"	"	"	"	1569	747	61616
12	12AM	4881	2568	93169	0	"	20228	"	"	"	1562	745	61617
13	12AM		2590	93193	0	"	20235	"	"	458069	1571	744	61617
14	12AM		2612	93218	.00	"	"	"	"	"	1589	738	61616
15	12AM		2634	93241	.00	21.6	20242	153750	1264798	458218	15.60	7.38	61617
16	12AM	4882	2660	93274	.00	21.6	20242	153750	1264798	458218	15.66	741	61617
17	12AM	4899			0	21.6	20242	153750	1264798	458218	15.82	7.39	61617
18	12AM	4921		93314	0	21.9	20264	"	"	458774	1561	747	61617
19	12AM	4942		93338	0	22	"	"	"	458880	1573	742	61617
20	12AM	4964		93362	0	22.1	20271	"	"	"	1572	742	61617
21	12AM	4979	2667		.00	21.6	"	"	1265520	458917	1580	744	61617
22	12AM		2694	93405	.00	21.6	20221	153750	1265520	458917	1580	741	61617
23	12AM		2716	93441	.00	21.6	20271	153750	1265520	458917	1580	745	61617
24	12AM		2738	93465	.00	21.8	20296	153760	1266815	459197	1587	7.45	61617
25	12AM		2754	93482	0	21.8	20302	"	"	459728	1574	741	61617
26	12AM	4998	2758	93506	0	21.9	"	"	1266815	459802	1571	739	61617
27	12AM	5019		93530	0	21.7	20308	"	"	459937	1575	741	61616
28	12AM	5041		93554	.00	21.9	20315	"	"	459968	1578	739	61617
29	12AM	5068			.00	21.8	20315	153750	1266815	459968	15.78	7.43	61617
30	12AM	5077	1770	93607	.05	22.0	20315	153750	1266815	460355	15.79	7.43	61617
31	12AM		2788	93626	.25	22.1	20333	153750	1266815	460446	16.08	741	61617

Month: SEPTEMBER

LEACHATE DAILY LOG

Year: 2023

Date	Time	P15A	P15B	AC HRS	RAIN	18 LVL	CP HRS	SSL	CELL 1	TS/GL	TRAN P	E HRS	DAILY EFFLUENT
1	12AM	5077	2810	93650	0	21.8	20339	153750	1267865	460720	15 84	740	61617
2	12AM		2832	93674	0	21.9	"	"	"	460877	1571	738	61617
3	12AM		2853	93697	.9	21.8	20345	"	"	460961	15 62	737	61617
4	12AM	5096	2856	93729	.Ø	21.8	20351	153750	1267865	461079	15.62	7.43	61617
5	12AM	5119	2856	93753	.Ø	22.1	20351	153750	1267865	461079	15.86	746	61617
6	12AM	5140		93775	.Ø	22.1	20351	153750	1267865	461079	15.86	7.47	61617
7	12AM	5162		93801	.Ø	22.1	20351	153750	1268880	461492	15.86	7.48	61617
8	12AM	5175	2865	93822	.Ø	21.7	20368	153750	1269933	461561	15.64	7.48	61617
9	12AM		2888	93845	.Ø	21.7	20368	153750	1269933	461561	15.64	7.45	61617
10	12AM		2909	93867	.Ø	21.7	20381	153750	1269933	461706	15.64	7.44	61617
11	12AM		2930	93897	.Ø	21.8	20386	153750	1269933	461743	1583	7.47	61617
12	12AM		2952	93921	.2	21.8	20391	153750	1269933	461807	15.83	7.47	61616
13	12AM		2954	93945	.Ø	22.1	20391	153750	1269933	461876	15.72	7.45	61617
14	12AM	5222		93968	.Ø	22.1	20396	153750	1269933	461876	1572	7.47	61617
15	12AM	5240		93993	0	21.9	20396	153750	1269933	461876	15.83	7.48	61617
16	12AM	5261		94010	0	21.7	20423	"	1271580	462192	1579	742	61617
17	12AM	5273	2964	94034	0	21.5	20427	"	1271850	462278	15 68	744	61617
18	12AM	17	2986	94058	0	21.1	"	"	1273669	"	15 81	748	47848
19	12AM	17	3003	94072	.2	20.9	20436	"	1275187	462347	1586	7.46	47848
20	12AM	21	3020	94080	.2	20.9	20436	153750	1275187	462347	15.83	7.46	47848
21	12AM	21	3043	94080	.Ø	20.9	20456	153750	1276397	462716	15.83	7.41	61617
22	12AM	5287	3052	94083	.Ø	20.9	20470	153750	1276397	462792	15.83	7.45	61620
23	12AM	5306		94086	.4	21.Ø	20474	153750	1276397	462931	15.75	7.31	61617
24	12AM	5325		94088	.7	20.9	20485	"	1276395	462941	16 02	7.39	61617
25	12AM	5347		94091	.2	20.5	20486	"	1278420	463543	1597	741	61617
26	12AM	5369		94094	.7	20.4	20488	"	1279773	463732	1598	739	61617
27	12AM	5371	3072	94097	.8	20.5	20500	"	"	464933	1662	741	61617
28	12AM		3094	94101	.4	20.6	20504	153750	1279773	465958	15.86	7.40	61617
29	12AM		3116	94107	.Ø	20.6	20504	153750	1279773	466500	15.86	7.34	61617
30	12AM		3137	94108	.Ø	20.7	20504	153750	1279773	466629	15.63	7.38	61617
31	12AM											7.32	61617

compressor off

Month: October

Year: 2023

LEACHATE DAILY LOG

Date	Time	P15A	P15B	AC HRS	RAIN	LS LVL	GR HRS	SSL	CELL	TS/CL	TRANS	ETH	DAILY EFFLUENT
1	12AM	5380	3150	94162	.55	20.7	20523	153756	1279773	466721	15.7	7.31	616 17
2	12AM	5402		94114	.6	20.8	"	"	"	466764	15.93	728	6 16 17
3	12AM	5424		94118	.2	20.8	"	"	"	467426	1545	731	616 17
4	12AM	5446		94121	0	"	20542	"	"	467649	1554	727	616 17
5	12AM	5468		94126	.0	20.9	20546	"	"	467668	1571	726	61617
6	12AM	5469	3176	94131	.0	20.9	20551	153750	1279773	467752	15.92	7.29	61617
7	12AM		3193	94135	.0	20.9	20556	153750	1279773	467837	1592	7.30	61617
8	12AM		3214	94138	.0	21.2	20564	153750	1279773	467925	15.90	7.25	616116
9	12AM		3241	94141	.2	21.1	20561	153750	1279773	467925	15.90	9.43	61617
10	12AM		3248	94144	.8	21.0	20561	153750	1279773	468063	16.19	7.41	61617
11	12AM	5501		94187	.8	20.9	20572	153750	1280630	468169	15.76	7.415	61617
12	12AM	5523		94151	.0	21.0	20578	153750	1280630	468499	15.64	7.25	61617
13	12AM	5549		94155	.2	21.0	20590	153750	1280630	468532	15.64	7.27	61617
14	12AM	5567	3253	94158	.0	20.9	20590	153750	1280630	468532	15.77	729	61617
15	12AM		3275	94162	.4	20.9	20590	153750	1281650	468900	15.77	7.38	616116
16	12AM		3291	94164	.2	20.9	20602	153750	1281650	468967	15.77	7.40	61616
17	12AM		3319	94168	.25	20.9	20602	153750	1281650	468967	15.66	7.34	616617
18	12AM		3335	94170	0	20	20614	"	1282040	469103	1590	723	61617
19	12AM	5578	3346	94173	.0	21.1	20624	"	"	469172	1588	722	61617
20	12AM	5600		94177	.1	"	20629	"	"	"	1596	725	61617
21	12AM	5622		94180	.2	21.2	20649	"	"	469214	1595	726	611617
22	12AM	5649		94185	.0	21.5	20654	153750	1282040	469224	15.83	7.30	61617
23	12AM	5665	3347	94190	.0	21.5	20654	153750	1282040	469224	15.83	7.35	611617
24	12AM		3373	94197	.4	21.3	20659	153750	1282040	469257	16.13	7.39	61616
25	12AM		3995	94195	.2	21.3	20	153750	1282040	469292	16.17	742	61617
26	12AM		3412	94198	0	21.4	20683	"	"	469293	1567	727	616617
27	12AM		3434	94202	0	21.2	"	"	1283170	469297	1570	722	61617
28	12AM	5677	3444	94205	0	21.3	20689	"	"	469308	1571	724	616617
29	12AM	5699		94208	.0	21.3	20695	"	"	469318	1577	735	611617
30	12AM	5723		94213	.0	21.5	20695	153750	1283170	469319	15.78	7.40	611617
31	12AM	5743		94215	.0	21.4	20695	153750	1283170	469319	15.93	738	61617

20713

Month: November

LEACHATE DAILY LOG

Year: 2023

Date	Time	P15A	P15B	AC HRS	RAIN	L8 LVL	GP HRS	S-SL	CELL1	TS/QL	TRAN P	E-PH	DAILY EFFLUENT
1	12AM			94219	.4	21.5	20713	153750	1283170	469319	15.91	7.40	61616
2	12AM		3467	94222	.25	21.5	20713	153750	1283170	469323	15.91	7.38	61617
3	12AM	5763	3489	94224	.9	21.5	20723	"	"	"	1577	734	61616
4	12AM		3511	94227	.125	21.6	20729	"	"	"	1581	727	61617
5	12AM		3533	94231	.35	21.7	"	"	"	"	1580	728	61617
6	12AM	5776	3542	94234	.6	21.8	20735	"	"	"	1585	728	61617
7	12AM	5804		94239	.4	21.9	20735	153750	1283170	469323	15.07	7.30	61617
8	12AM	5825	3524	94243	.0	21.8	20749	153750	1283170	469323	15.70	7.24	61617
9	12AM	5847	3542	94246	.Ø	22.0	20749	153750	1284110	469323	1594	7.28	61617
10	12AM	5861	3546	94250	.9	22.0	20758	153750	1284110	469323	1594	7.28	61617
11	12AM		3566	94252	.9	22.1	20768	"	"	"	1629	730	61617
12	12AM		3589	94255	.55	"	"	"	"	"	1593	733	61617
13	12AM		3610	94259	.35	22.2	"	"	"	"	1551	729	61617
14	12AM		3632	94262	.Ø	22.4	20788	"	"	"	1592	724	61617
15	12AM	5881	3640	94267	.Ø	22.4	20788	153750	1284110	469323	15.92	7.34	61617
16	12AM	5903	3640	94271	Ø	22.4	20788	153750	1284110	469323	15.92	7.35	61617
17	12AM	5924	3640	94275	.Ø	22.4	20809	153750	1284110	469323	1592	7.37	61617
18	12AM	5946		94277	.55	22.1	20809	153750	1284110	469352	15.92	7.48	61617
19	12AM	5959	3644	94279	.05	22.6	20818	"	"	"	1548	738	61617
20	12AM		3665	94282	0	22.8	"	"	"	"	1568	7.20	61616
21	12AM		3687	94284	.25	23.1	20826	"	"	"	1554	720	61617
22	12AM		3709	94289	.Ø	22.9	20834	"	"	"	1587	7.17	61617
23	12AM		3731	94294	.Ø	22.9	20841	153750	1284110	469352	1587	7.11	61617
24	12AM	5979	3738	94297	.Ø	22.9	20841	153750	1284110	469352	1587	7.23	61617
25	12AM	5996		94300	.Ø	23.1	20841	153750	1284110	469352	15.90	7.13	61617
26	12AM	6017		94305	0	23.1	20850	153750	1284110	469352	15.88	7.13	61617
27	12AM	6040		94308	0	23.2	"	"	"	"	1595	715	61617
28	12AM	6057	3743	94311	0	23.3	20860	"	"	"	1586	715	61617
29	12AM		3764	94314	0	23.2	20866	"	"	"	1590	715	61617
30	12AM		3787	94319	0	23.3	20874	"	1284440	"	1611	723	61617
31	12AM		30				20874						

Month: December

Year: 2023

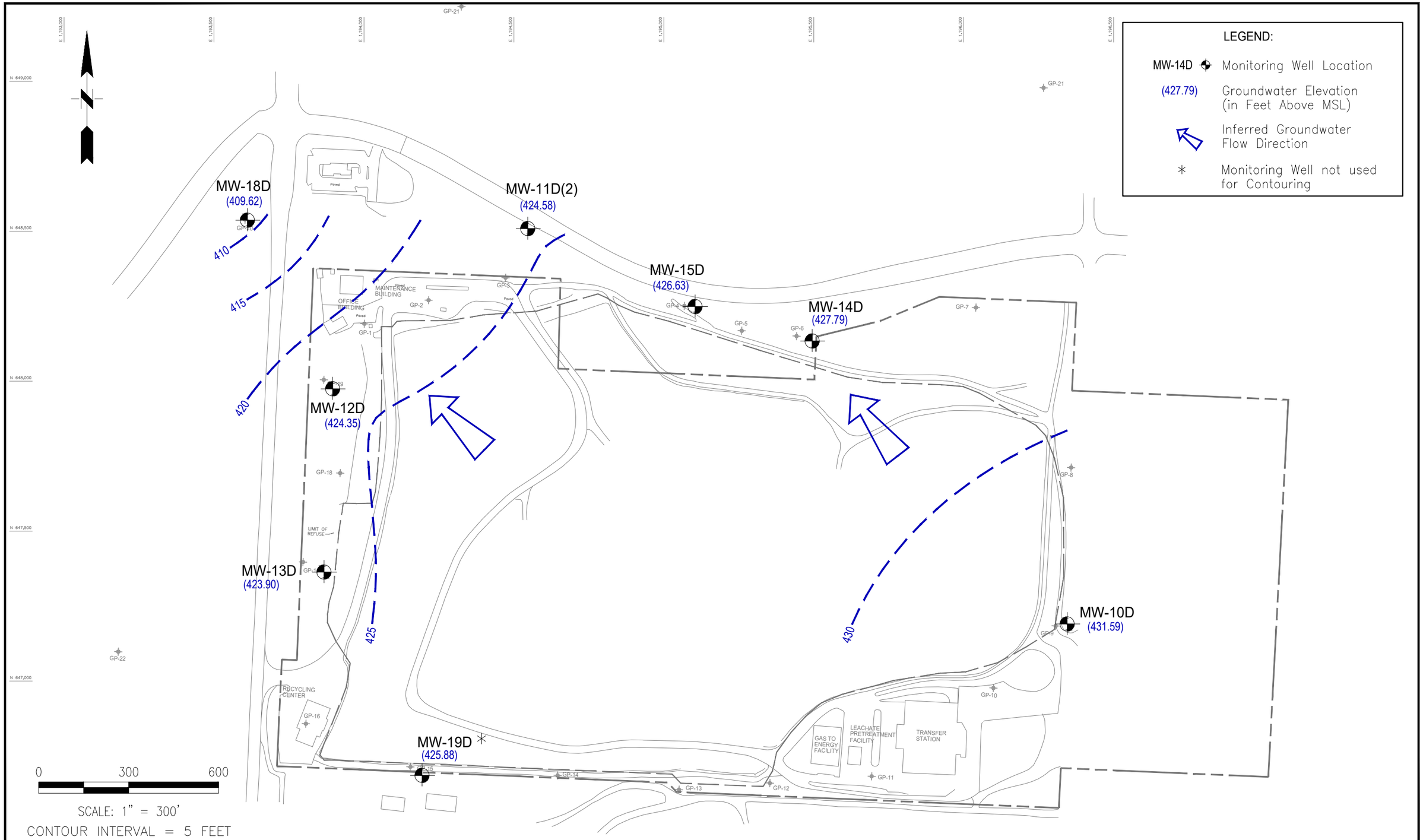
LEACHATE DAILY LOG

Date	Time	P15A	P15B	AC HRS	RAIN	L8 LVL	GP HRS	SSL	CELL 1	TS/CL	TRAN P	E PH	DAILY EFFLUENT
22 1	12AM	6057	3813	94323	.8	22.8	20874	153750	1285340	469352	15.59	7.13	61617
22 2	12AM		3830	94326	.6	22.9	20874	153750	1286450	469352	15.43	7.15	61617
22 3	12AM	6073	3836	94330	.8	22.9	20895	153750	1286450	469352	15.43	7.14	61617
22 4	12AM	6095	3836	94333	.6	22.9	20907	153750	1286450	469352	15.43	7.12	61617
22 5	12AM	6117		94335	2.4	23.2	11	11	11	11	1578	7.12	61617
22 6	12AM	6139		94337	.7	23.3	11	11	11	11	1597	715	61617
* 20 7	12AM	6155	3841	94341	.45	23.2	20922	11	1287400	11	1572	719	48601
12 8	12AM		3858	94345	.5	23.2	11	11	1288670	11	1555	723	Ø
0 9	12AM		3858	94349	.6	23.2	20922	153750	1289730	469352	15.55	7.35	0
0 10	12AM	6155	3858	94352	.4	23.3	20922	153750	1289730	469352	15.56	7.45	12922
5 11	12AM		3863	94356	.2	23.4	20936	153750	1289730	469353	15.75	8.13	18940
7 12	12AM		3870	94360	.2	23.4	20936	153750	1289720	469353	15.75	8.03	40880
9 13	12AM		3886	94365	.4	23.4	20936	153750	1290700	469353	15.75	7.54	31607
12 14	12AM		3895	94367	.0	23.4	20936	153750	1291730	469353	15.79	7.37	31887
2 15	12AM		3907	94371	.0	23.4	20936	153750	1291730	469353	15.79	7.21	7492
9 16	12AM		3909	94374	.2	23.4	20936	153750	1291730	469353	15.79	7.20	24770
10 17	12AM		3918	94377	.0	23.6	20936	153750	1291790	469353	15.82	7.18	24407
21 18	12AM		3928	94381	.6	23.8	20936	153750	1291780	469353	15.86	7.16	43306
16 19	12AM	6170	3934	94384	.4	23.8	20936	153750	1291720	469352	15.86	7.15	61617
10 20	12AM	6186		94386	2.1	22.8	20936	153750	1291730	469352	15.86	7.22	60010
17 21	12AM	6208		94389	0	23.9	11	11	1291730	469413	15.92	718	49134
16 22	12AM	6225		94392	.25	23.8	11	11	1292500	11	1597	714	44713
12 23	12AM	6241		94395	0	23.7	11	11	1293300	11	1587	714	51175
14 24	12AM	6253		94400	.0	23.8	11	11	11	11	1621	733	22185
0 25	12AM		3948	94404	.4	23.9	20936	153750	1293300	469413	16.09	7.30	Ø
0 26	12AM		3948	94408	.2	23.9	20936	153750	1293300	469413	15.76	7.30	Ø
0 27	12AM		3948	94412	.4	24.0	20936	153750	1293300	469413	15.58	7.34	Ø
3 28	12AM		3948	94416	.65	24.0	20936	153750	1293300	469413	15.58	7.23	9097
5 29	12AM		3951	94419	.05	23.9	11	11	1294261	11	1641	732	13969
0 30	12AM		3956	94420	.0	23.7	11	11	1295500	11	1584	730	0
7 31	12AM	6253	3956	94425	.45	23.8	20936	153750	1295500	469413	1611	727	11970

20936

Appendix C

WATER LEVEL DATABASE



SCS ENGINEERS
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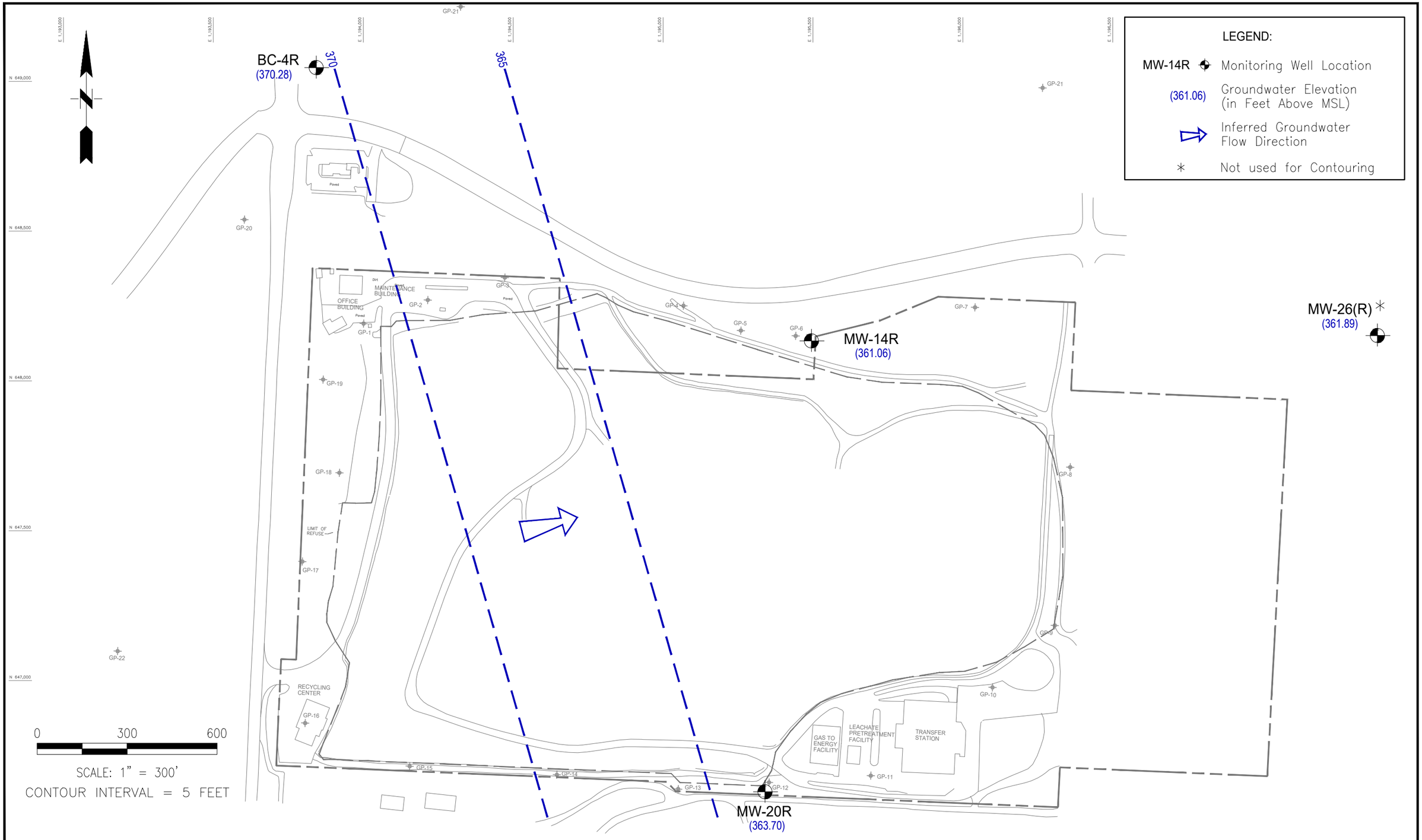
Bellevue, Washington 98005
(425) 746-4600 FAX: (425) 746-6747

PROJECT NO. 04223002.02	DES BY AMD	UPPER REGIONAL AQUIFER WATER LEVEL MAP JANUARY 24, 2023	DATE MAY 2023
SCALE AS SHOWN	CHK BY KGL	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	FIGURE 2
CAD FILE FIGURE 2	APP BY KGL		



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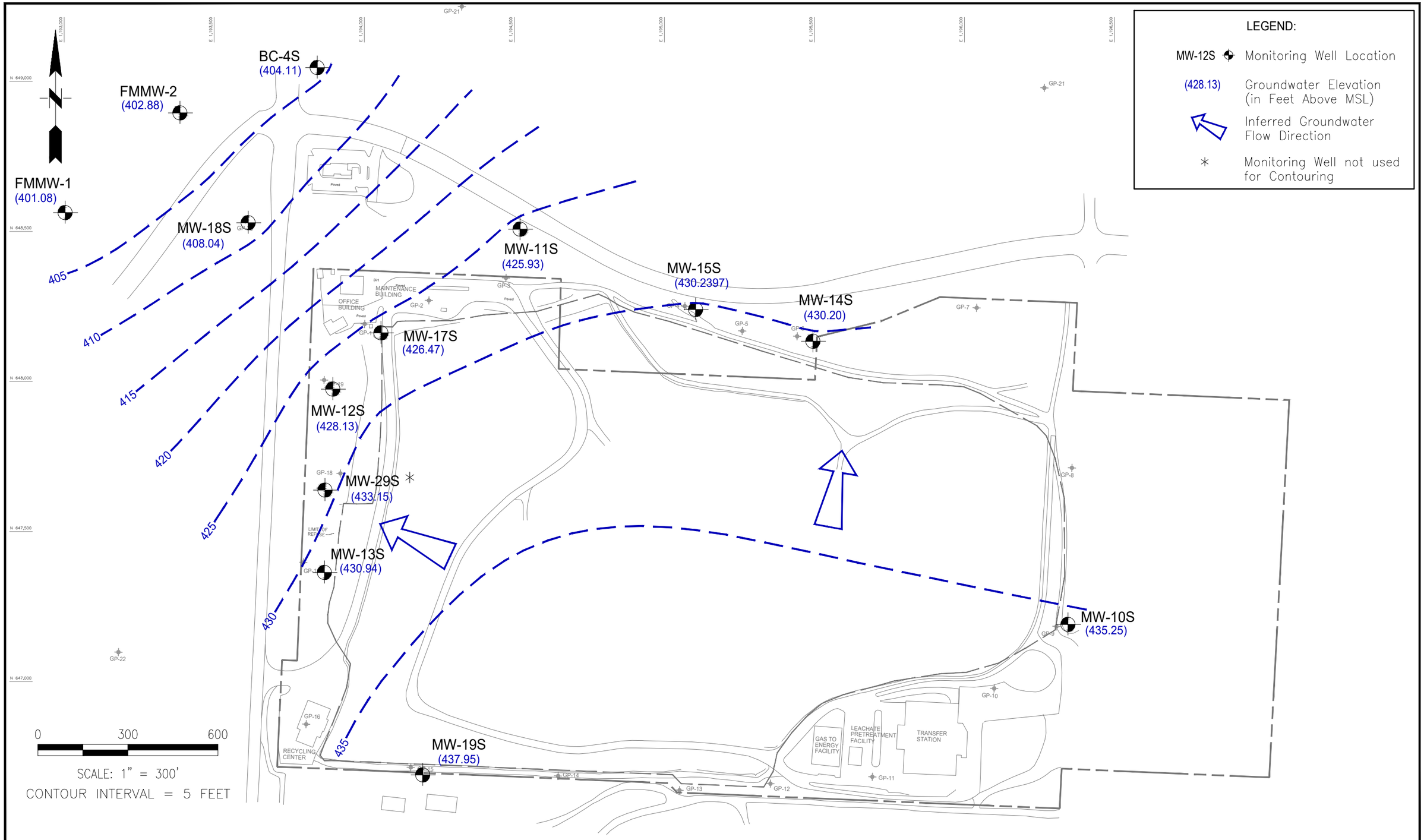
PROJECT NO. 04223002.02	DES BY AMD	LOWER REGIONAL AQUIFER WATER LEVEL MAP JANUARY 24, 2023	DATE MAY 2023
SCALE AS SHOWN	CHK BY KGL	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	FIGURE 3
CAD FILE FIGURE 3	APP BY KGL		



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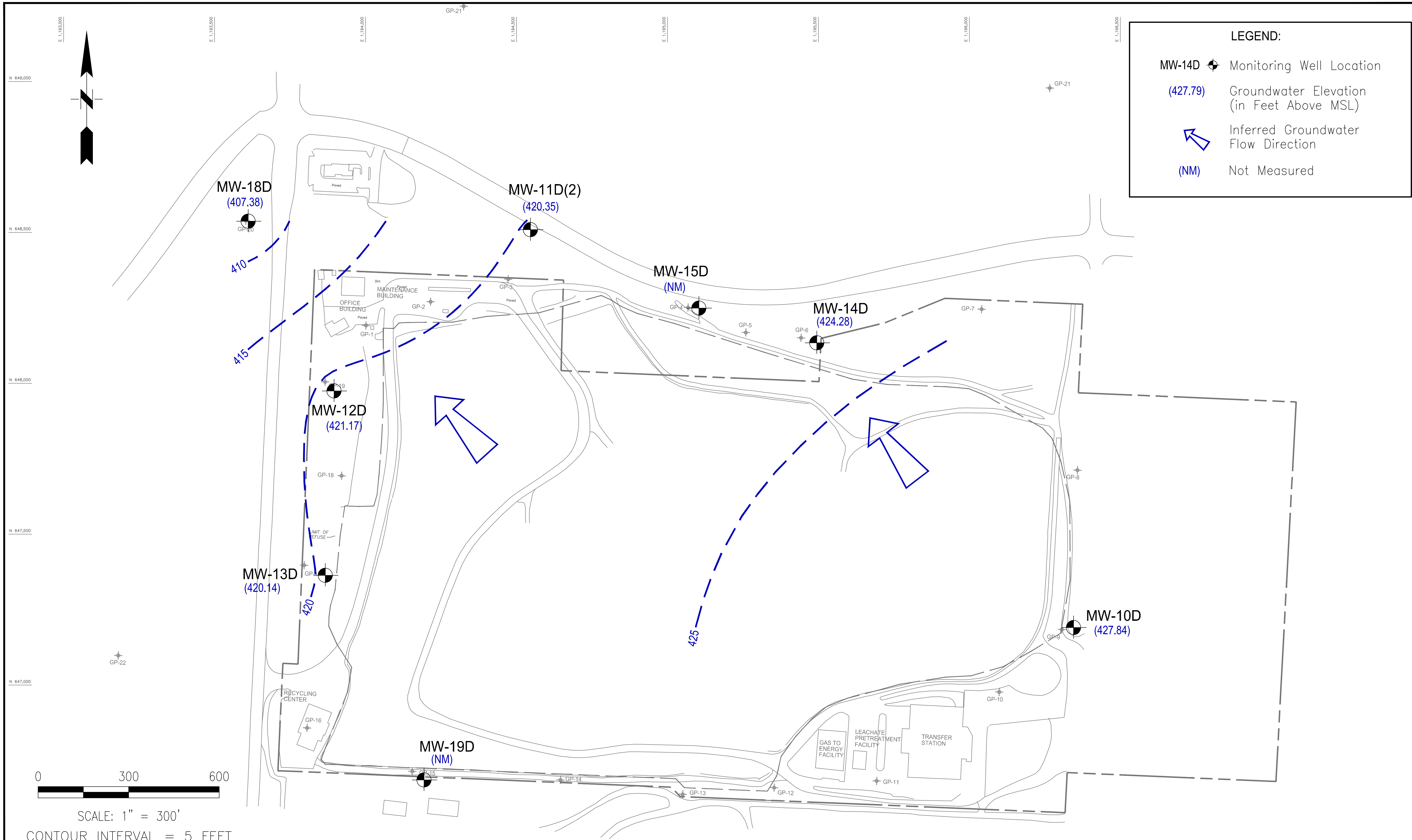
PROJECT NO. 04223002.02	DES BY AMD	SHALLOW PERCHED AQUIFER WATER LEVEL MAP JANUARY 24, 2023 HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	DATE MAY 2023
SCALE AS SHOWN	CHK BY KGL		FIGURE 1
CAD FILE FIGURE 1	APP BY KGL		



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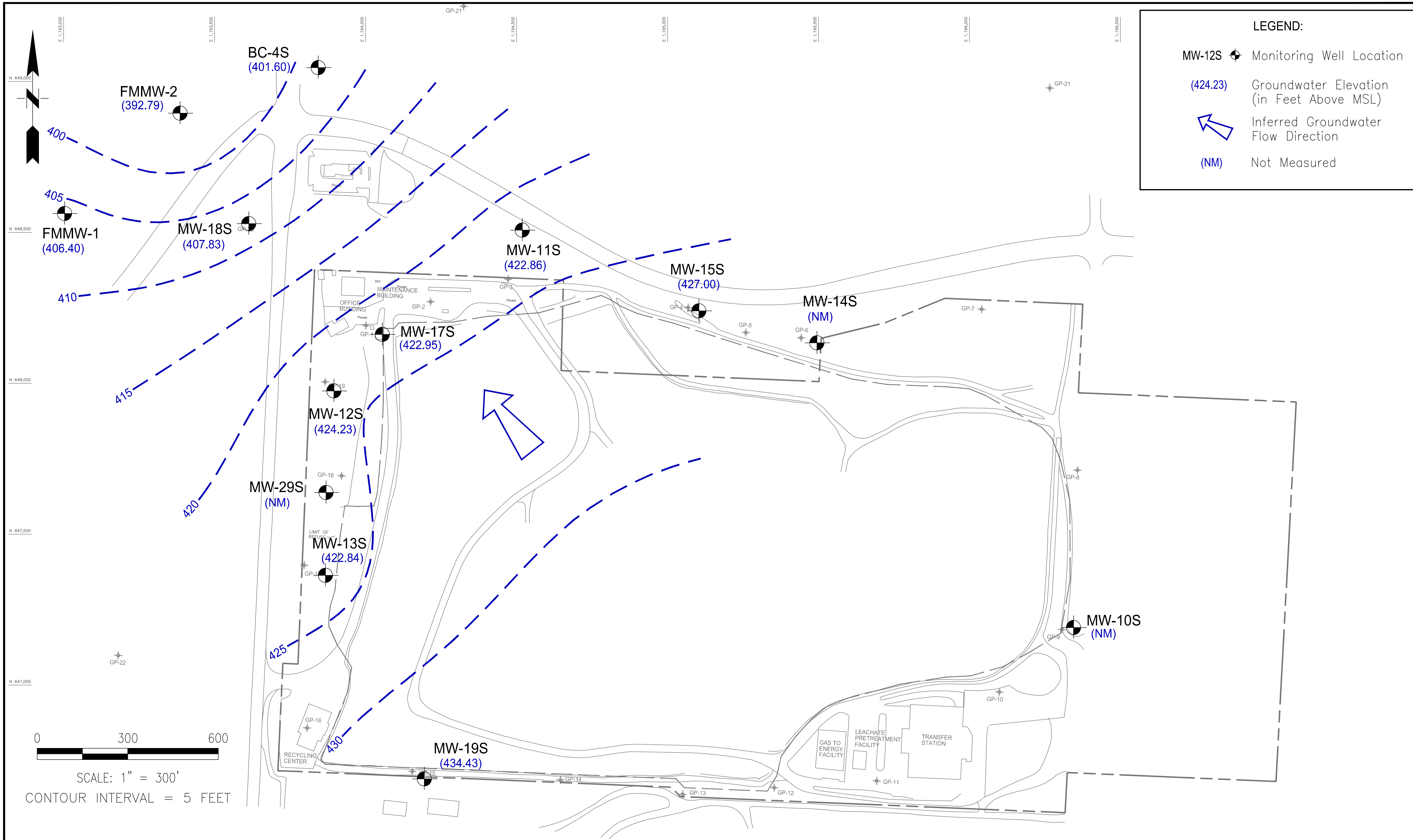
PROJECT NO. 04223002.02	DES BY AMD	UPPER REGIONAL AQUIFER WATER LEVEL MAP JULY 19, 2023 HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	DATE FEBRUARY 2024
SCALE AS SHOWN	CHK BY KGL		FIGURE 2
CAD FILE FIGURE 2	APP BY KGL		


LEGEND:
MW-12S Monitoring Well Location
(424.23) Groundwater Elevation (in Feet Above MSL)
Inferred Groundwater Flow Direction
(NM) Not Measured
BC-4S (401.60)
FMMW-2 (392.79)
FMMW-1 (406.40)
MW-18S (407.83)
MW-11S (422.86)
MW-15S (427.00)
MW-14S (NM)
MW-17S (422.95)
MW-12S (424.23)
MW-29S (NM)
MW-13S (422.84)
MW-10S (NM)
MW-19S (434.43)
400
405
410
415
420
425
430
OFFICE BUILDING
MAINTENANCE BUILDING
RECYCLING CENTER
GAS TO ENERGY FACILITY
LEACHATE PRETREATMENT FACILITY
TRANSFER STATION
0 300 600
SCALE: 1" = 300'
CONTOUR INTERVAL = 5 FEET

SCS ENGINEERS

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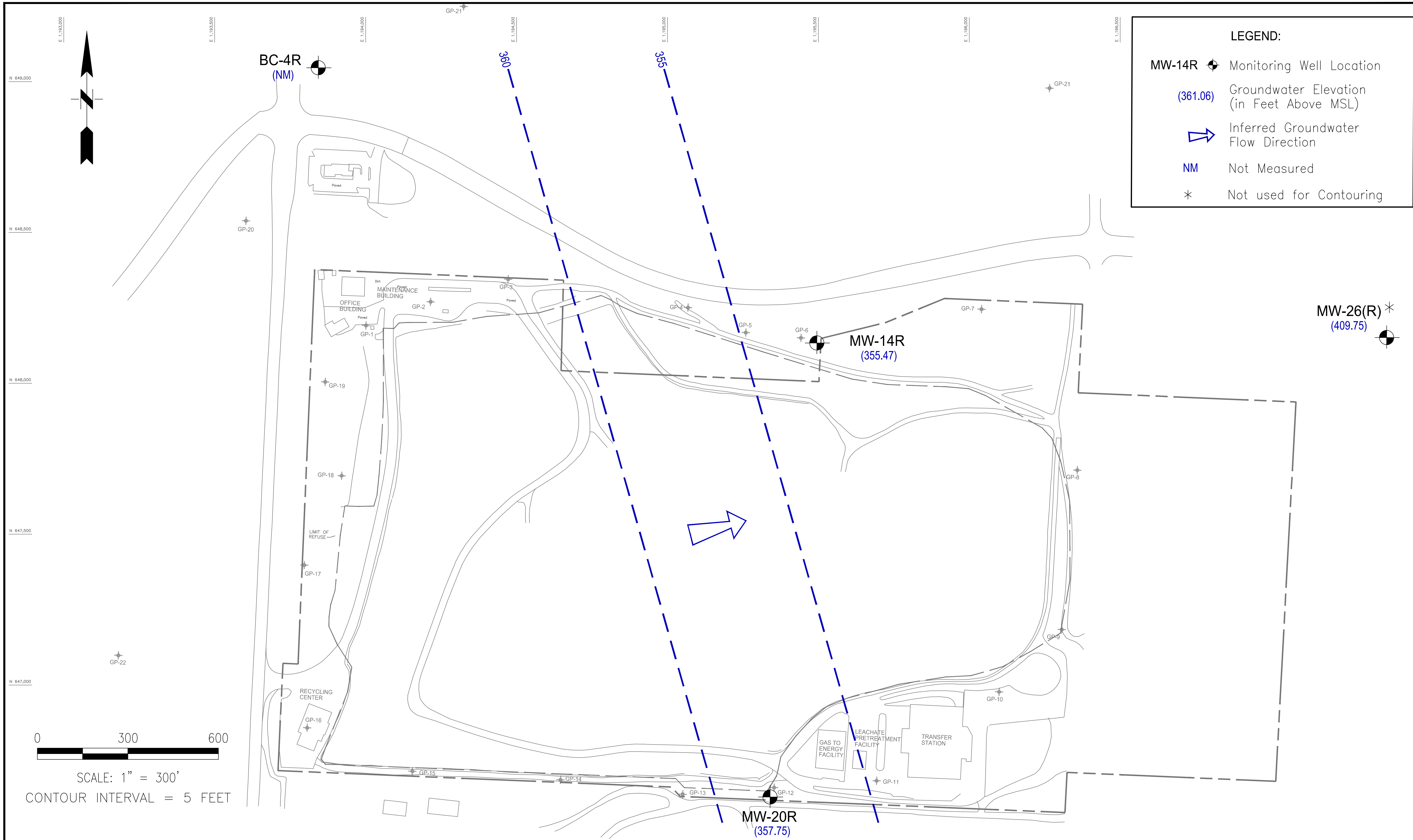
PROJECT NO. 04223002.02	DES BY AMD	SHALLOW PERCHED AQUIFER WATER LEVEL MAP JULY 19, 2023	DATE FEBRUARY 2024
SCALE AS SHOWN	CHK BY KGL	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	FIGURE 1
CAD FILE FIGURE 1	APP BY KGL		



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PROJECT NO. 04223002.02	DES BY AMD	LOWER REGIONAL AQUIFER WATER LEVEL MAP JULY 19, 2023	DATE FEBRUARY 2024
SCALE AS SHOWN	CHK BY KGL	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	FIGURE 3
CAD FILE FIGURE 3	APP BY KGL		

Water Level Measurements
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	TOC ELEV	01/15/88	02/23/88	02/24/88	04/26/88	05/24/88	06/24/88	07/18/88	07/19/88	07/20/88	07/21/88	08/30/88	08/31/88	09/15/88	09/16/88	10/25/88	12/01/88	12/02/88	12/22/88
MW-10S	463.65	427.99	427.49	--	435.51	436.45	436.11	--	435.06	--	--	432.25	--	430.78	--	428.08	433.69	--	433.08
MW-10D	464.09	--	425.36	--	431.46	431.95	392.59	--	367.17	--	--	376.81	--	426.94	--	402.14	355.13	--	402.27
MW-11S	520.03	--	--	DRY	425.79	426.18	425.77	--	--	--	424.54	--	--	--	--	DRY	--	424.29	--
MW-11D	520.10	--	--	421.19	425.61	425.97	--	--	--	--	424.33	--	421.72	420.74	--	419.81	--	--	423.94
MW-11D(2)	519.53	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12S	493.41	--	DRY	--	430.70	DRY	--	--	--	426.74	--	--	--	--	--	DRY	--	--	--
MW-12D	493.49	419.44	420.09	--	423.68	424.91	425.17	--	--	423.32	--	--	421.11	420.34	--	419.18	--	422.21	422.64
MW-13S	452.26	--	--	425.74	428.20	428.68	428.16	--	--	426.35	--	--	424.31	--	423.78	422.97	425.86	--	425.31
MW-13D	450.19	420.14	--	419.37	423.79	424.16	--	--	--	422.53	--	--	--	--	--	418.84	--	--	--
MW-14S	481.30	--	DRY	--	430.41	430.68	430.30	428.90	--	--	--	--	426.40	425.74	--	DRY	428.70	--	428.52
MW-14D	481.39	421.74	422.74	--	427.75	427.06	427.31	426.19	--	--	--	--	423.86	423.24	--	421.71	424.80	--	425.37
MW-14R	480.26	--	--	--	366.46	366.73	--	365.84	--	--	--	--	--	--	--	363.73	--	--	--
MW-15S	506.78	--	--	--	434.88	--	--	433.45	--	--	--	--	--	--	--	429.85	--	--	--
MW-15D	509.09	--	--	--	433.89	--	--	432.30	--	--	--	--	--	--	--	427.97	--	--	--
MW-16S^	480.27	--	--	--	427.52	--	--	--	425.92	--	--	--	--	--	--	421.67	--	--	--
MW-16D^	480.73	--	--	--	425.67	--	--	--	423.45	--	--	--	--	--	--	419.52	--	--	--
MW-17S	555.97	--	--	--	425.63	--	--	--	--	424.67	--	--	--	--	--	419.84	--	--	--
MW-18S	541.43	--	--	--	408.30	--	--	--	--	--	407.39	405.64	--	--	405.06	404.71	--	406.31	407.54
MW-18D	541.79	--	--	--	409.22	--	--	--	--	--	408.40	--	--	--	--	405.70	--	--	--
MW-19S	489.23	--	--	--	433.87	--	--	--	432.93	--	--	--	--	--	--	430.71	--	--	--
MW-19D	489.35	--	--	--	426.18	--	--	--	423.41	--	--	--	--	--	--	419.75	--	--	--
MW-20R	472.90	--	--	--	364.52	--	--	--	375.01	--	--	--	--	--	--	372.19	--	--	--
MW-22U	549.17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-22L	548.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-23S	448.34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-23D	448.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-25S	527.80	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-25D	527.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-26R	485.40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-27S	531.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-27D	531.92	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-28S	466.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-29S	450.65	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BC-4S	530.25	--	--	402.57	404.81	--	--	--	--	--	--	--	402.65	--	--	401.39	--	--	--
BC-4R	530.31	--	--	369.76	372.49	--	--	--	--	--	--	370.56	--	--	--	369.53	--	--	--
FMMW-1	546.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FMMW-2	539.96	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes: Water level elevations have been recalculated based on the most recent TOC survey data from 5/23/2018
Before June 1996 well elevations were: MW-11s 501.48; MW-11d 501.45; MW-15s 490.53; MW-15d 490.61
Between June 1996 and March 2001 well elevations were: MW-11s 512.13; MW-11d 512.06
Before October 30, 1999 well elevations were: MW-27s 531.81; MW-27d 531.92
Before January 21, 2000 well elevations were: MW-10s 455.45; MW-10d 456.19
Before May 18, 2001 well elevations were: MW-23s 449.92; MW-23d 449.96
Before September 2000, well elevations were: BC-4S 524.35; BC-4R 524.46
Before November 19, 2004 well elevations were: MW-25S 526.54; MW-25D 526.66
Before August 2005 well elevations were: MW-18S 546.88; MW-18D 546.01, new elevations are field measurements, not survey results
MW-23S, MW-23D, MW-25S, MW-25D, MW-27S, MW-27D and MW-28S were abandoned in 2017. Subsequent data cells marked with "N/A".
-- = Water level not measured/not available
* = The well casing was blocked and SCS was unable to measure DTW at this location.
^ = Water level measurements are no longer taken at MW-16S and MW-16D
Dry = Well dry and therefore no WLE was calculated

Water Level Measurements
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Hidden Valley Landfill, Pierce County, Washington

WELL	01/24/89	03/02/89	03/04/89	03/15/89	03/16/89	04/25/89	05/25/89	06/29/89	06/30/89	07/17/89	07/18/89	07/19/89	09/05/89	10/04/89	10/25/89	10/26/89	10/27/89	11/15/89	12/18/89
MW-10S	436.08	437.65	--	--	439.78	444.69	442.91	439.43	--	437.98	--	--	434.41	431.97	430.18	--	--	431.26	433.16
MW-10D	411.63	433.30	--	--	435.47	439.85	437.76	378.37	--	433.58	--	--	429.64	427.73	426.55	--	--	--	--
MW-11S	426.22	--	427.72	429.47	--	433.99	432.61	429.97	--	--	428.69	--	424.26	DRY	--	DRY	--	DRY	424.47
MW-11D	426.01	--	--	--	--	432.89	--	--	--	--	428.44	--	--	422.09	--	420.66	--	--	--
MW-11D(2)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12S	429.12	--	--	432.40	--	435.70	--	--	426.49	--	--	430.70	DRY	DRY	--	DRY	--	DRY	DRY
MW-12D	424.81	426.19	--	428.15	--	432.31	430.73	--	--	--	--	426.59	422.79	421.18	--	420.19	--	--	--
MW-13S	426.79	427.60	--	429.80	--	433.86	432.25	--	429.86	--	428.93	--	425.85	424.80	--	423.97	--	424.84	425.82
MW-13D	424.01	--	--	--	--	431.35	--	--	--	--	425.74	--	--	--	--	--	419.47	--	--
MW-14S	430.77	--	432.55	--	435.12	440.67	438.50	427.68	--	433.31	--	--	428.31	426.46	DRY	--	--	426.60	428.64
MW-14D	427.88	--	428.99	--	431.50	435.81	434.01	--	--	429.72	--	--	--	--	422.88	--	--	--	--
MW-14R	366.28	--	--	--	--	372.16	--	--	--	--	364.64	--	--	--	364.72	--	--	--	--
MW-15S	435.45	--	--	439.55	--	444.45	--	--	438.70	433.20	--	--	432.70	430.99	--	429.87	--	430.87	433.52
MW-15D	434.02	--	--	--	--	442.04	--	--	--	440.28	--	--	--	--	--	429.04	--	--	--
MW-16S^	427.90	--	--	--	--	439.37	--	--	--	--	431.22	--	--	--	422.35	--	--	--	--
MW-16D^	425.63	--	--	--	--	433.43	--	--	--	--	427.26	--	--	--	420.66	--	--	--	--
MW-17S	426.57	--	--	430.41	--	434.25	--	--	430.41	--	428.32	--	424.52	422.55	--	421.10	--	420.88	423.72
MW-18S	409.61	410.66	--	411.67	--	415.44	414.91	--	412.76	--	--	411.65	409.71	407.44	--	--	406.72	406.20	408.28
MW-18D	409.45	--	--	--	--	415.40	--	--	--	--	--	411.27	--	--	--	--	406.52	406.58	408.06
MW-19S	436.49	--	--	--	--	440.89	--	--	--	--	435.90	--	--	--	--	--	430.30	--	--
MW-19D	425.40	--	--	--	--	432.12	--	--	--	--	427.43	--	--	--	--	--	421.47	--	--
MW-20R	374.97	--	--	--	--	381.08	--	--	--	--	--	368.86	--	--	--	372.97	--	--	--
MW-22U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DRY	DRY
MW-22L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	403.71	405.26
MW-23S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-23D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-25S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-25D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-26R	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-27S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-27D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-28S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-29S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BC-4S	405.40	--	--	--	--	410.52	--	--	--	--	--	406.99	--	--	--	--	402.69	--	--
BC-4R	372.43	--	--	--	--	378.09	--	--	--	--	--	373.42	--	--	--	--	370.77	--	--
FMMW-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FMMW-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Water Level Measurements
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	01/03/90	01/15/90	01/24/90	01/29/90	02/12/90	02/27/90	03/12/90	03/26/90	04/09/90	04/25/90	05/07/90	05/21/90	06/04/90	06/18/90	07/02/90	07/24/90	09/04/90	10/01/90	10/22/90
MW-10S	432.26	438.75	--	441.97	445.00	446.08	446.31	445.70	444.75	443.92	443.16	441.82	441.60	428.93	440.13	438.59	436.17	428.80	433.53
MW-10D	--	--	--	437.98	--	--	--	440.70	--	438.94	--	437.09	--	436.54	--	434.42	431.39	435.02	--
MW-11S	423.74	429.85	--	431.41	434.50	435.19	434.84	434.48	433.69	432.93	432.37	431.41	430.86	431.12	430.41	429.03	426.00	424.17	422.26
MW-11D	--	--	--	431.12	--	--	--	--	--	432.74	--	--	--	--	--	428.71	--	423.92	--
MW-11D(2)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12S	DRY	432.03	432.47	434.06	436.63	436.56	436.49	436.21	435.43	434.69	434.37	433.42	433.16	433.26	432.36	429.79	--	--	--
MW-12D	--	--	--	430.27	--	--	--	--	--	431.76	--	--	--	--	--	427.49	424.53	--	421.83
MW-13S	425.20	431.30	431.35	432.74	435.61	436.05	435.88	435.26	434.52	433.96	433.13	432.79	432.66	432.52	431.72	430.31	428.13	427.11	426.90
MW-13D	--	--	--	429.55	--	--	--	--	--	431.67	--	--	--	--	--	426.69	--	422.38	--
MW-14S	428.30	435.36	437.46	438.16	441.65	442.87	442.85	442.05	440.82	439.77	438.86	437.36	436.35	436.89	435.77	434.06	430.42	428.38	427.82
MW-14D	--	--	--	434.36	--	--	--	--	--	435.09	--	--	--	--	--	430.58	--	425.55	--
MW-14R	--	--	--	369.69	--	--	--	--	--	370.84	--	--	--	--	--	359.37	--	363.08	--
MW-15S	432.92	439.33	--	441.55	444.99	446.09	445.75	445.29	444.27	443.34	440.67	441.40	440.78	441.07	440.06	438.31	434.98	--	--
MW-15D	--	--	--	439.68	--	--	--	--	--	441.13	--	--	--	--	--	436.56	--	--	--
MW-16S^	--	--	--	436.38	--	--	--	--	--	433.05	--	--	--	--	--	427.06	--	--	--
MW-16D^	--	--	--	431.37	--	--	--	--	--	432.43	--	--	--	--	--	428.09	--	--	--
MW-17S	424.11	435.97	430.63	431.91	434.87	435.24	435.00	434.62	433.92	433.20	432.87	431.99	431.43	431.68	430.95	429.57	426.39	424.45	--
MW-18S	408.21	410.13	411.08	413.05	415.35	--	417.08	415.99	415.40	414.93	414.76	415.23	413.51	DRY	412.89	411.58	409.74	408.54	407.49
MW-18D	407.80	411.82	--	413.51	415.87	417.18	416.45	416.64	416.10	415.27	414.92	414.15	413.38	413.49	413.00	411.60	409.50	408.20	--
MW-19S	--	--	--	440.26	--	--	--	--	--	440.23	--	--	--	--	--	436.63	--	--	--
MW-19D	--	--	--	431.91	--	--	--	--	--	432.10	--	--	--	--	--	428.23	--	--	--
MW-20R	--	--	--	378.07	--	--	--	--	--	378.69	--	--	--	--	--	363.88	--	369.09	--
MW-22U	DRY	DRY	--	DRY	412.95	413.80	413.48	413.64	413.29	412.72	412.22	412.00	411.97	DRY	411.97	411.72	406.57	--	--
MW-22L	415.09	408.07	408.95	410.00	412.41	413.72	413.53	413.48	412.86	412.13	411.63	410.89	410.09	--	409.83	408.31	406.35	--	--
MW-23S	--	--	--	432.63	--	--	--	--	--	432.47	--	--	--	--	--	429.61	--	426.73	--
MW-23D	--	--	--	427.92	--	--	--	--	--	428.61	--	--	--	--	--	424.96	--	--	--
MW-25S	--	--	--	404.32	--	--	--	--	--	407.69	--	--	--	--	--	402.12	--	399.24	--
MW-25D	--	--	--	407.37	--	--	--	--	--	410.27	--	--	--	--	--	405.81	--	--	--
MW-26R	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-27S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-27D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-28S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-29S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BC-4S	--	--	--	408.09	--	--	--	--	--	410.27	--	--	--	--	--	407.19	--	--	--
BC-4R	--	--	--	375.40	--	--	--	--	--	378.36	--	--	--	--	--	372.06	--	--	--
FMMW-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FMMW-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Water Level Measurements
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	11/26/90	12/17/90	01/29/91	02/25/91	03/26/91	04/29/91	06/28/91	07/29/91	01/20/92	04/14/92	07/14/92	10/19/92	03/22/93	06/02/93	09/07/93	12/07/93	03/14/94	06/07/94	09/19/94
MW-10S	--	439.17	440.15	444.80	436.70	447.78	446.84	438.68	432.83	436.97	433.79	DRY	430.85	436.53	433.09	428.36	431.34	431.20	DRY
MW-10D	--	--	437.29	--	--	442.81	437.36	434.56	427.69	432.27	428.65	424.38	427.04	432.03	429.14	425.87	428.13	427.47	423.19
MW-11S	431.14	430.37	430.17	433.68	434.81	435.71	431.78	429.42	422.87	426.32	423.19	DRY	423.72	420.86	416.65	413.86	418.23	415.97	410.81
MW-11D	--	--	431.15	--	--	435.59	--	429.14	422.51	426.17	423.14	418.40	423.64	420.67	416.54	413.73	418.04	415.82	410.72
MW-11D(2)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12S	429.56	432.71	432.50	434.23	436.28	433.82	433.55	431.51	DRY	428.20	DRY	420.20	DRY	428.81	--	--	--	--	--
MW-12D	--	--	430.54	--	--	435.37	--	427.75	420.98	424.69	421.69	417.89	420.99	424.36	421.85	419.07	421.66	420.32	416.75
MW-13S	432.48	431.58	433.78	435.88	427.04	437.99	434.28	432.08	422.68	425.92	422.65	419.36	421.21	425.53	423.10	--	422.94	421.57	417.93
MW-13D	--	--	427.89	--	--	434.54	--	427.32	420.04	423.65	420.40	417.03	418.81	423.27	420.83	418.06	420.63	419.29	415.67
MW-14S	--	435.80	423.70	450.65	442.30	443.74	437.77	434.36	427.40	431.92	427.62	DRY	426.78	431.72	427.51	426.08	428.35	427.13	DRY
MW-14D	--	--	436.69	--	--	439.25	433.66	430.74	423.86	428.14	424.30	420.96	423.18	427.96	425.05	422.15	424.83	423.61	419.92
MW-14R	--	--	370.91	--	--	373.66	--	361.62	364.60	364.86	358.84	360.16	362.71	362.30	358.60	361.51	362.38	361.06	357.66
MW-15S	--	--	441.09	--	--	446.38	--	438.90	431.90	435.92	432.28	428.17	431.18	435.83	--	429.53	432.99	431.53	427.68
MW-15D	--	--	439.86	--	--	445.39	--	436.94	429.68	434.16	430.27	427.00	429.23	433.97	431.16	428.24	430.93	429.70	425.96
MW-16S^	--	--	434.89	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-16D^	405.49	--	431.36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17S	--	--	431.78	--	--	435.41	--	430.09	422.87	426.60	414.25	418.39	422.29	426.97	423.71	419.98	424.98	422.77	417.32
MW-18S	--	412.41	--	414.91	406.79	416.45	414.35	412.49	DRY	DRY	DRY	405.65	407.73	410.17	407.86	406.42	409.63	408.23	406.13
MW-18D	--	--	--	--	--	418.17	414.57	412.38	407.40	409.40	--	405.10	406.55	409.25	407.36	405.61	407.57	406.75	404.65
MW-19S	--	--	--	--	--	441.19	--	439.72	430.81	433.21	429.48	426.94	430.33	433.11	429.57	427.31	430.70	429.14	425.62
MW-19D	--	--	--	--	--	435.06	--	427.93	419.81	424.24	420.27	417.06	419.08	422.80	424.91	421.33	421.95	427.06	415.64
MW-20R	--	--	379.40	--	--	380.21	--	365.60	375.48	370.85	362.62	366.69	368.84	369.37	365.39	368.45	368.69	367.69	362.64
MW-22U	--	--	--	--	--	405.03	--	412.08	411.93	411.91	411.93	411.88	411.84	411.83	412.14	411.88	411.89	411.88	411.82
MW-22L	--	--	DRY	--	--	414.00	--	409.21	404.77	406.38	404.59	402.60	403.90	406.22	404.37	402.97	404.85	404.08	402.33
MW-23S	--	--	431.73	--	--	429.94	--	430.28	426.11	427.38	425.59	422.09	426.54	427.46	425.22	423.01	426.11	424.79	420.91
MW-23D	--	--	428.00	--	--	431.86	--	425.43	419.36	422.39	419.50	416.24	419.16	422.21	419.55	417.14	419.74	418.50	414.73
MW-25S	--	--	404.54	--	--	412.34	--	403.25	399.17	399.99	398.66	397.72	398.29	400.04	398.53	397.87	399.47	397.06	397.58
MW-25D	--	--	406.91	--	--	414.08	--	406.76	401.69	403.37	401.33	399.65	400.76	403.36	401.38	399.88	401.89	400.91	399.23
MW-26R	--	--	--	--	--	--	--	--	422.00	425.83	422.23	418.86	420.86	422.78	421.87	419.26	422.32	420.88	417.12
MW-27S	--	--	--	--	--	--	--	--	418.61	423.23	418.89	416.24	417.80	423.19	418.84	416.44	419.39	417.93	415.62
MW-27D	--	--	--	--	--	--	--	--	419.12	423.47	419.53	416.07	418.44	423.34	419.84	416.84	419.92	418.69	415.20
MW-28S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-29S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BC-4S	--	--	--	--	--	412.92	--	--	404.26	405.62	--	401.42	403.22	405.48	403.55	401.78	404.02	403.19	401.20
BC-4R	--	--	--	--	--	369.92	--	--	371.19	372.58	--	367.63	369.43	370.85	367.88	363.21	369.45	368.53	366.36
FMMW-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FMMW-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Water Level Measurements
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	12/05/94	03/18/95	06/19/95	09/19/95	12/13/95	03/19/96	06/12/96	09/03/96	12/10/96	12/11/96	03/25/97	06/09/97	09/08/97	12/15/97	03/16/98	06/24/98	09/16/98	12/21/98	04/09/99
MW-10S	429.46	441.64	438.30	431.80	436.63	447.59	444.28	437.45	--	439.64	449.09	442.97	436.79	435.67	440.78	437.25	431.48	437.27	445.95
MW-10D	425.96	439.10	434.93	427.99	434.00	443.71	440.91	433.94	--	437.40	445.78	439.58	433.06	430.81	437.93	433.36	427.15	435.30	442.33
MW-11S	418.15	425.46	422.10	416.95	423.30	425.09	433.07	418.00	421.34	--	426.98	422.22	415.98	416.46	421.38	417.61	412.58	419.42	424.49
MW-11D	417.88	425.31	421.97	416.80	423.04	424.99	432.96	417.86	420.13	--	426.88	422.05	416.82	416.32	421.15	417.45	412.44	419.28	424.37
MW-11D(2)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12S	--	433.68	--	--	--	--	434.71	429.84	--	--	437.34	--	--	--	--	429.29	--	--	435.33
MW-12D	420.01	431.55	--	--	--	--	433.34	426.50	--	--	437.39	--	--	--	--	425.59	--	--	434.42
MW-13S	421.36	432.58	428.50	422.16	428.51	436.95	434.49	427.68	431.04	--	438.43	432.99	427.01	425.97	431.71	427.02	421.48	429.57	435.58
MW-13D	419.11	430.31	426.23	419.83	426.15	434.60	432.21	425.37	428.74	--	436.15	430.68	424.67	423.64	429.34	424.95	419.15	427.22	433.26
MW-14S	427.58	438.29	434.01	427.21	433.13	443.69	440.55	432.84	436.27	--	444.90	439.06	431.67	430.40	437.04	432.10	426.30	433.69	441.91
MW-14D	422.81	435.55	431.09	424.20	430.69	440.23	437.81	430.29	433.90	--	442.24	436.05	429.20	427.72	434.40	429.59	423.29	432.17	438.94
MW-14R	360.04	369.03	--	--	--	373.23	--	--	--	--	375.79	372.77	--	--	372.26	369.06	--	367.76	377.41
MW-15S	431.88	441.83	--	--	--	--	435.80	437.13	--	--	443.20	--	--	--	--	432.05	--	--	440.66
MW-15D	429.06	441.57	--	--	--	--	435.82	436.07	--	--	437.95	--	--	--	--	525.26	--	--	434.75
MW-16S^	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-16D^	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17S	423.64	432.07	429.51	424.07	429.79	435.17	433.27	428.57	431.06	--	435.77	432.27	427.54	443.32	431.32	428.09	422.98	429.24	433.80
MW-18S	408.77	414.75	--	--	--	--	DRY	411.34	--	--	417.05	--	Dry	Dry	413.60	410.54	--	411.66	415.75
MW-18D	406.57	414.93	411.50	407.06	411.03	418.79	416.81	411.26	--	413.20	420.04	415.78	410.33	419.67	413.87	410.23	406.46	411.19	417.79
MW-19S	430.65	438.17	--	--	--	--	439.08	433.57	--	--	442.25	--	--	--	--	433.09	--	--	439.81
MW-19D	419.40	433.82	--	--	--	--	434.31	425.87	--	--	438.09	--	--	--	--	424.16	--	--	434.11
MW-20R	367.32	377.03	--	--	--	380.52	--	--	--	--	378.13	--	--	--	378.75	372.68	--	--	381.44
MW-22U	411.79	412.33	--	--	--	--	413.54	408.28	--	--	414.90	--	--	--	--	411.85	--	411.80	413.46
MW-22L	403.97	411.50	--	--	--	--	412.76	411.66	--	--	416.49	--	407.10	--	--	407.00	--	407.54	414.42
MW-23S	426.02	430.94	427.78	424.75	429.37	433.76	431.80	427.50	--	427.10	434.60	431.35	427.15	427.01	430.92	427.28	424.07	428.77	432.50
MW-23D	418.86	427.76	--	--	--	--	429.71	423.78	--	--	433.41	--	423.11	422.29	427.46	423.22	--	425.09	--
MW-25S	399.71	407.39	--	--	401.96	--	410.74	402.43	--	--	415.13	--	401.39	--	--	401.46	--	403.13	412.72
MW-25D	401.32	409.70	405.91	401.29	405.30	--	412.72	404.96	--	--	416.69	411.61	404.92	403.70	408.83	404.80	401.02	405.80	414.14
MW-26R	420.20	432.36	--	--	--	437.94	--	--	--	--	440.28	--	--	--	432.28	--	--	429.90	437.08
MW-27S	417.69	430.84	--	--	--	--	433.34	426.05	--	--	436.35	--	--	--	--	425.22	--	--	435.18
MW-27D	417.89	430.78	--	--	--	--	433.07	425.86	--	--	437.98	--	--	--	--	425.02	--	--	434.74
MW-28S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-29S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BC-4S	403.03	409.91	--	--	--	--	411.41	406.50	--	--	414.11	--	--	--	--	405.49	--	406.29	--
BC-4R	367.47	376.58	--	--	--	--	379.59	371.70	--	--	383.77	--	--	--	--	374.77	--	373.33	--
FMMW-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FMMW-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Water Level Measurements
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	06/07/99	09/13/99	12/13/99	03/15/00	06/09/00	09/12/00	01/18/01	03/22/01	04/19/01	07/12/01	10/23/01	01/18/02	04/25/02	07/25/02	10/24/02	01/30/03	04/24/03	07/24/03	10/30/03
MW-10S	440.31	435.19	434.31	--	440.42	435.67	432.45	431.01	425.45	431.63	423.52	439.17	442.23	436.36	428.62	434.14	437.02	432.12	430.00
MW-10D	437.10	430.29	434.84	440.17	436.95	430.43	427.59	427.74	428.48	427.12	423.01	436.72	439.20	432.24	426.28	430.90	434.22	427.80	426.68
MW-11S	420.04	415.65	419.32	426.93	430.10	425.18	423.31	422.18	423.76	421.93	417.39	430.10	432.17	426.78	420.53	428.84	428.03	422.55	421.79
MW-11D	419.89	414.90	418.47	426.93	429.89	425.04	--	422.04	423.61	421.81	417.27	430.09	431.83	426.64	420.42	428.52	427.87	422.42	421.65
MW-11D(2)	--	--	--	--	429.56	423.62	420.78	420.74	421.20	419.95	416.88	429.34	431.79	425.18	418.99	424.21	426.49	420.52	419.89
MW-12S	431.44	--	430.79	434.01	431.25	426.60	425.03	422.96	425.45	423.41	420.29	431.59	433.23	428.31	421.60	427.04	429.03	423.70	422.20
MW-12D	429.79	422.90	427.02	431.88	429.10	422.96	421.40	420.59	420.86	419.64	416.44	429.00	431.22	424.74	419.39	423.79	426.11	420.21	419.65
MW-13S	430.64	424.91	428.75	433.31	430.57	424.79	424.61	422.47	422.62	421.31	418.10	430.75	433.31	427.32	421.47	425.91	427.95	422.13	421.67
MW-13D	428.29	422.33	426.31	431.85	428.27	422.28	420.49	419.90	420.14	418.87	415.61	428.24	430.53	424.31	418.43	424.83	426.44	419.37	419.06
MW-14S	435.91	429.07	434.18	439.91	435.75	429.25	427.50	426.42	427.71	426.08	421.59	434.95	438.12	430.93	424.61	430.26	432.49	426.20	426.05
MW-14D	434.07	425.40	431.11	436.38	433.32	426.41	423.89	423.79	424.29	422.99	419.77	432.94	435.47	428.36	422.06	426.69	429.99	423.64	423.07
MW-14R	370.78	360.18	366.72	373.26	369.79	363.33	363.66	355.02	354.67	347.91	349.36	356.05	360.45	351.96	353.91	355.58	359.54	350.75	355.08
MW-15S	--	429.24	--	438.60	435.06	429.30	427.51	426.67	427.73	426.51	422.67	434.67	437.38	431.04	424.71	429.65	432.01	426.45	426.06
MW-15D	--	422.30	--	432.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	421.96
MW-16S^	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-16D^	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17S	430.05	425.35	429.33	431.15	429.69	425.37	423.40	422.04	423.42	422.02	416.65	430.07	431.67	426.99	420.72	425.82	427.66	422.66	421.41
MW-18S	Dry	Dry	411.57	414.46	412.01	408.68	407.31	406.81	407.32	406.76	405.96	412.66	415.75	409.91	406.09	408.46	410.59	406.96	406.48
MW-18D	413.48	408.16	410.66	414.97	412.70	402.50	406.50	406.15	406.54	405.88	404.23	412.10	413.09	409.59	405.40	407.86	410.22	406.37	405.75
MW-19S	--	430.75	--	438.94	435.83	430.90	430.18	428.56	430.05	429.11	425.58	436.50	437.98	432.27	426.67	432.01	433.63	428.20	428.66
MW-19D	--	422.40	--	432.29	429.88	422.20	--	422.66	420.01	421.57	415.96	431.30	430.96	424.14	421.14	426.65	426.35	420.05	419.38
MW-20R	--	--	--	381.10	375.78	370.29	369.65	362.53	361.24	352.45	356.57	364.32	366.91	356.37	359.61	360.63	365.21	354.47	360.08
MW-22U	411.87	411.99	411.77	412.12	411.74	411.90	--	418.36	--	411.77	411.76	411.83	411.96	411.88	411.85	411.83	411.83	411.83	411.79
MW-22L	410.03	405.15	407.23	411.50	409.30	405.12	--	403.23	405.73	403.00	401.82	408.55	411.22	406.28	402.64	404.48	406.85	403.30	402.91
MW-23S	427.83	426.17	429.15	431.62	428.74	426.10	425.11	424.28	424.38	424.02	420.01	429.36	430.66	426.72	421.88	426.86	427.36	423.52	423.38
MW-23D	425.35	--	--	428.71	426.04	420.98	--	418.31	418.24	417.24	414.80	425.84	428.05	422.13	417.02	421.05	423.50	418.02	417.75
MW-25S	406.26	399.65	402.07	408.62	405.62	399.66	399.04	398.49	399.12	398.45	397.69	403.93	408.25	401.21	397.96	400.43	401.87	398.56	398.62
MW-25D	408.78	402.74	405.09	410.31	408.06	402.82	--	399.04	401.61	400.66	399.30	406.84	410.29	404.55	400.28	402.89	405.11	401.15	400.71
MW-26R	--	--	--	434.06	431.10	424.12	421.55	421.99	422.69	420.95	417.75	429.98	432.67	425.45	419.58	424.06	427.10	420.61	419.98
MW-27S	--	--	--	431.83	429.31	421.77	--	417.86	418.95	417.81	415.59	427.92	431.41	424.01	416.90	421.45	425.44	418.43	417.81
MW-27D	--	--	--	431.95	428.99	422.76	--	418.61	419.53	418.49	415.18	428.07	431.16	424.05	417.41	421.92	425.55	419.02	418.27
MW-28S	--	--	--	--	427.07	423.74	--	--	--	--	--	427.42	428.56	424.95	422.18	--	425.82	422.21	--
MW-29S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BC-4S	--	--	--	--	--	403.69	--	401.45	401.93	401.47	400.20	407.13	409.31	404.61	400.65	402.68	405.28	401.47	401.10
BC-4R	--	--	--	--	--	371.04	--	367.95	368.07	364.84	363.38	370.31	374.56	368.66	366.63	367.72	371.20	365.66	366.17
FMMW-1	--	--	--	407.92	405.10	400.56	398.73	398.55	398.58	398.47	397.64	403.73	407.47	401.78	398.13	398.73	402.24	398.64	397.93
FMMW-2	--	--	--	408.76	406.32	402.23	400.31	399.91	400.06	401.36	398.86	404.44	408.36	403.02	399.45	400.31	403.76	400.21	399.26

Water Level Measurements
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	01/22/04	04/15/04	06/29/04	10/21/04	01/27/05	02/23/05	04/21/05	07/22/05	10/17/05	01/18/06	04/14/06	08/08/06	10/26/06	01/18/07	04/26/07	07/19/07	10/11/07	01/24/08	04/17/08
MW-10S	436.15	436.45	427.28	429.79	435.10	--	436.46	434.32	429.41	444.27	441.85	435.00	430.65	445.84	441.84	436.42	434.09	438.52	439.06
MW-10D	432.72	433.60	425.35	426.94	431.09	--	432.97	429.89	426.03	440.71	439.08	430.14	426.93	442.71	440.22	432.35	429.07	435.33	436.09
MW-11S	427.33	427.08	420.71	421.04	425.46	--	426.52	424.67	420.06	433.68	436.78	424.48	420.35	434.55	432.19	426.15	422.82	428.96	429.15
MW-11D	427.21	426.96	--	--	425.30	--	426.39	424.52	419.94	433.49	431.63	424.31	420.26	434.82	432.17	426.01	422.69	429.12	428.99
MW-11D(2)	425.73	426.53	418.92	419.64	423.73	--	425.50	423.03	418.94	432.78	431.98	423.00	419.75	435.30	433.01	425.14	421.51	428.15	428.91
MW-12S	428.57	430.59	421.86	422.26	--	--	--	426.10	--	--	432.97	425.79	420.98	435.58	433.23	427.50	--	429.92	430.25
MW-12D	425.21	426.18	418.64	419.23	423.64	--	425.18	422.61	418.71	432.21	431.33	422.49	419.45	434.39	432.19	424.62	420.97	427.20	428.04
MW-13S	427.09	427.90	420.05	421.03	425.31	--	426.81	424.09	420.26	433.60	432.49	423.56	420.94	435.56	433.30	425.89	422.45	428.39	429.25
MW-13D	424.52	425.45	417.54	418.56	422.89	--	424.45	421.74	417.90	431.29	430.22	421.17	418.60	433.27	431.02	423.52	420.18	426.21	426.83
MW-14S	431.21	431.37	424.80	426.11	429.13	--	430.61	428.35	424.54	440.16	438.40	428.34	424.75	441.87	438.87	430.27	427.83	433.49	434.33
MW-14D	429.00	426.58	421.87	423.18	427.02	--	428.78	426.05	422.06	436.34	435.52	426.06	422.76	438.82	436.67	428.35	424.53	431.30	432.18
MW-14R	358.99	361.73	351.70	356.38	359.06	--	363.06	357.84	357.48	363.43	368.93	354.35	357.85	369.11	367.45	355.73	359.17	363.20	366.05
MW-15S	431.16	431.42	424.61	425.36	429.20	--	430.68	428.55	424.52	438.93	437.03	428.45	424.76	440.45	437.94	430.25	426.86	433.22	433.94
MW-15D	427.82	435.91	427.84	429.30	425.98	--	427.70	424.99	428.06	435.20	434.37	424.99	421.67	437.59	435.47	427.28	423.34	430.20	430.59
MW-16S^	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-16D^	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17S	427.12	427.16	420.54	420.09	425.40	--	426.31	424.73	419.85	433.02	431.26	424.50	418.19	433.88	431.56	425.98	421.39	428.05	428.67
MW-18S	410.32	410.37	406.55	406.30	--	408.71	409.30	408.77	--	406.65	413.69	408.66	406.66	407.83	405.69	401.26	398.83	411.62	412.01
MW-18D	409.47	410.12	405.59	405.65	--	407.66	408.89	407.74	--	408.59	415.38	408.36	406.02	410.91	409.21	402.82	400.04	411.68	412.48
MW-19S	433.43	433.46	426.37	427.51	--	--	433.20	430.65	426.66	440.41	437.51	430.22	426.73	440.99	437.84	431.44	429.21	434.92	434.86
MW-19D	425.40	429.24	420.90	420.51	427.08	--	428.40	423.04	419.84	434.97	432.75	421.86	419.91	435.18	434.36	424.07	422.16	429.12	426.49
MW-20R	365.13	367.55	355.13	362.77	364.70	--	370.57	368.57	363.35	368.45	375.02	356.82	363.82	375.66	373.17	358.22	363.32	366.81	370.42
MW-22U	411.80	411.80	411.76	411.78	--	--	411.73	411.70	411.67	412.56	411.93	411.91	411.92	414.00	412.37	406.46	411.91	411.88	411.93
MW-22L	406.07	401.68	402.77	402.72	--	--	405.32	404.56	402.55	411.24	411.55	404.83	402.81	414.01	412.41	411.72	403.58	407.72	408.72
MW-23S	427.33	426.98	421.90	423.12	426.42	--	427.22	426.81	--	434.54	431.58	426.99	423.52	434.74	432.07	428.03	426.22	428.13	427.94
MW-23D	422.92	423.21	416.77	417.47	420.82	--	422.38	421.50	--	431.53	429.77	421.75	418.56	432.41	430.17	423.10	420.33	424.12	425.12
MW-25S	401.25	401.40	--	--	400.23	--	400.86	398.32	396.69	407.84	407.33	398.24	396.69	410.92	408.72	399.75	397.52	402.59	404.10
MW-25D	404.54	404.80	--	--	401.62	--	402.57	400.62	398.08	408.45	408.77	400.76	398.27	411.43	409.96	402.42	399.38	404.63	406.01
MW-26R	425.63	426.18	418.09	419.08	423.19	--	424.52	421.75	417.85	431.23	430.74	421.10	419.62	435.55	432.87	423.86	423.86	426.24	427.52
MW-27S	424.31	424.72	416.86	417.50	421.54	--	423.09	421.01	416.89	431.74	431.41	421.17	417.03	434.62	432.82	423.82	419.02	426.60	428.13
MW-27D	424.47	425.08	417.15	418.02	422.11	--	423.70	421.51	417.15	431.58	431.22	421.57	417.67	434.38	432.58	424.02	419.79	426.33	427.98
MW-28S	424.25	425.50	--	--	421.63	--	423.30	--	--	430.34	428.30	423.12	--	430.59	428.57	423.37	422.21	426.60	426.59
MW-29S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BC-4S	404.44	403.99	400.77	400.63	402.62	--	403.22	403.20	400.60	409.55	409.78	403.19	400.99	412.43	409.27	404.68	401.77	406.16	407.06
BC-4R	369.82	372.04	365.20	365.88	368.95	--	370.99	369.51	366.70	373.71	377.99	368.21	367.40	378.61	378.85	369.47	368.79	372.50	374.21
FMMW-1	400.72	402.36	398.28	398.71	402.32	--	399.21	399.73	397.98	406.40	408.16	399.81	398.21	410.93	410.47	402.08	398.60	402.94	404.47
FMMW-2	402.38	403.85	399.63	399.17	400.25	--	401.03	401.85	399.35	407.58	408.85	401.85	399.52	411.56	409.80	403.38	400.15	404.58	405.94

Water Level Measurements
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	07/10/08	10/23/08	01/12/09	04/16/09	07/09/09	10/29/09	01/28/10	04/08/10	07/15/10	10/14/10	01/06/11	04/21/11	07/07/11	10/27/11	01/26/12	04/27/12	07/19/12	10/11/12	01/17/13
MW-10S	435.30	427.47	439.23	439.29	436.11	431.99	439.51	440.01	438.29	*	*	*	*	*	*	*	*	*	*
MW-10D	430.75	425.34	435.82	436.77	432.37	427.71	436.80	438.48	435.20	435.20	436.53	441.99	438.29	430.48	433.04	438.69	435.288	428.738	436.36
MW-11S	424.76	419.60	430.66	429.49	426.04	422.29	425.43	429.99	428.23	423.92	429.58	443.53	430.58	424.03	427.67	430.80	427.895	422.825	429.61
MW-11D	424.64	419.47	430.50	429.37	425.91	422.17	429.43	429.83	428.52	423.78	429.11	--	430.41	423.90	427.46	430.60	427.702	422.702	429.39
MW-11D(2)	423.73	418.67	428.94	429.62	425.34	420.91	429.12	429.91	427.95	422.26	429.12	434.73	431.83	423.03	426.03	431.27	427.771	421.641	429.38
MW-12S	425.31	--	431.79	430.56	--	--	429.59	431.04	451.41	--	430.30	434.21	431.52	--	428.74	431.74	429.336	427.856	430.61
MW-12D	422.89	418.35	428.33	428.91	424.88	420.51	428.57	429.75	427.29	421.86	428.50	434.49	430.32	423.03	425.72	430.71	427.566	420.876	428.54
MW-13S	423.95	419.79	429.85	430.20	426.04	422.13	430.37	430.58	428.51	423.45	429.52	434.56	431.36	424.72	427.35	431.83	429.185	422.225	429.65
MW-13D	421.64	417.44	427.49	427.83	423.72	419.75	427.98	428.17	426.13	420.98	427.46	432.17	428.90	422.32	424.94	430.04	426.69	419.84	427.23
MW-14S	428.61	--	434.77	434.64	430.10	426.97	434.69	435.61	433.28	427.99	434.64	440.84	436.68	428.10	432.29	436.60	432.818	426.558	434.75
MW-14D	426.51	421.62	431.64	432.86	428.37	423.72	432.61	433.26	431.32	425.92	432.11	438.44	434.77	426.13	429.13	434.84	431.59	424.39	432.76
MW-14R	359.64	357.00	362.03	367.99	359.40	357.76	363.32	366.15	360.15	361.90	363.18	366.10	366.13	359.81	360.76	366.15	358.954	354.814	362.35
MW-15S	428.71	423.98	434.51	434.18	430.13	426.53	434.26	434.93	432.81	428.07	434.10	439.58	436.01	428.26	431.88	435.90	432.59	426.79	434.35
MW-15D	425.36	420.50	430.68	431.77	427.37	422.64	431.48	432.07	430.04	424.85	431.28	437.2	434	--	427.69	433.74	430.59	423.13	431.65
MW-16S^	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-16D^	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17S	424.72	--	430.02	428.83	425.86	421.78	428.94	429.17	427.67	423.81	428.68	432.474	429.724	423.924	426.83	429.94	427.524	422.974	428.97
MW-18S	408.80	406.19	412.64	412.16	409.66	406.78	412.45	412.56	411.17	408.03	412.11	415.396	412.986	408.116	409.86	413.18	410.896	407.716	412.46
MW-18D	408.41	405.56	412.15	412.72	409.78	406.62	412.66	413.29	411.92	407.67	412.41	417.46	414.90	407.94	410.13	414.13	411.755	407.375	412.92
MW-19S	430.35	426.01	438.07	435.64	431.65	429.13	435.98	436.05	433.72	430.19	435.62	439.15	436.16	430.48	434.77	437.11	432.652	428.832	435.92
MW-19D	422.98	420.36	430.23	431.24	427.82	423.51	434.04	435.20	428.82	417.93	429.56	437.87	427.50	428.50	429.82	436.00	432.35	416.63	430.69
MW-20R	363.76	360.73	367.37	375.67	364.27	362.02	367.50	370.52	363.31	368.98	368.50	367.73	369.97	363.65	363.94	368.94	363.629	356.649	367.05
MW-22U	411.89	411.90	411.88	411.86	411.88	411.87	411.74	411.71	411.80	411.72	411.77	--	411.84	411.83	411.80	411.78	411.838	413.968	411.92
MW-22L	404.94	402.54	408.27	408.85	406.15	403.30	408.76	409.44	408.07	404.21	408.59	--	411.18	404.57	406.30	410.28	408.076	404.056	409.10
MW-23S	425.67	421.36	432.59	430.26	427.99	424.66	430.57	427.64	429.01	426.85	428.60	433.36	430.65	427.04	428.54	429.91	427.39	424.23	448.34
MW-23D	419.94	415.95	427.22	427.34	423.39	418.20	427.19	430.65	425.72	421.05	425.28	431.53	431.51	421.34	423.14	426.84	423.84	419.35	426.05
MW-25S	399.63	397.85	403.98	402.73	399.34	398.60	402.62	403.99	402.02	398.86	403.64	410.32	406.94	397.98	401.60	406.43	403.1	398.56	404.35
MW-25D	401.67	398.85	405.31	405.16	402.10	399.77	404.93	406.04	404.43	399.05	400.66	411.06	408.46	400.34	403.42	407.77	405.22	400.45	406.21
MW-26R	421.36	416.46	425.40	427.56	422.47	417.58	426.06	426.79	--	420.03	424.74	--	426.90	417.95	419.88	425.70	422	415.4	425.20
MW-27S	421.57	416.64	426.62	427.87	423.46	418.19	427.68	428.89	426.90	420.24	427.77	434.21	430.81	420.43	424.02	430.11	426.56	418.93	428.23
MW-27D	422.01	416.76	426.75	428.09	423.75	418.77	427.73	428.97	426.83	420.75	427.81	433.82	430.84	421.07	424.15	430.02	426.79	419.64	428.23
MW-28S	422.20	--	428.75	426.91	423.73	--	427.12	427.21	426.05	422.12	426.83	429.44	427.4	422.19	424.67	427.77	NM	422.07	421.75
MW-29S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BC-4S	403.08	400.54	406.51	406.51	404.51	401.07	407.25	407.78	406.54	402.76	406.84	411.756	409.246	402.646	404.19	408.30	406.246	402.26	407.28
BC-4R	369.50	366.23	370.58	374.48	370.17	367.12	--	--	371.53	--	--	--	--	--	370.41	375.16	386.882	385.60	372.66
FMMW-1	399.89	398.07	401.39	404.20	402.00	398.45	411.88	404.93	403.71	398.97	403.89	410.683	407.633	399.073	408.23	406.28	403.673	399.033	404.37
FMMW-2	401.95	399.41	403.08	405.81	403.27	399.92	398.05	406.45	405.32	400.93	405.54	411.75	408.31	401.01	394.17	407.21	405.287	400.867	406.027

Water Level Measurements
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	04/23/13	07/25/13	10/10/13	01/06/14	04/09/14	07/07/14	10/29/14	01/15/15	04/20/15	07/28/15	10/15/15	01/14/16	04/21/16	07/07/16	10/13/16	01/19/17	07/14/17	01/12/18	08/29/18
MW-10S	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	438.60	438.38	439.69	*
MW-10D	438.09	432.23	433.33	431.84	441.79	435.56	430.11	435.54	436.08	428.64	425.87	440.99	441.21	434.09	428.38	435.82	436.39	437.27	429.63
MW-11S	430.48	426.04	427.12	425.22	433.16	428.73	424.18	428.02	428.93	422.84	--	432.63	432.38	426.81	421.95	428.59	429.09	430.00	423.74
MW-11D	431.15	425.90	426.54	425.00	429.95	424.84	419.19	422.65	428.70	422.74	419.50	432.49	432.23	426.68	421.85	423.87	424.41	429.74	423.39
MW-11D(2)	430.58	425.10	426.28	423.92	433.89	428.78	422.93	426.58	428.94	421.78	419.43	434.08	434.53	426.99	421.38	428.64	429.71	430.21	422.99
MW-12S	431.20	--	433.19	--	434.91	--	--	428.91	430.18	423.89	420.36	433.47	433.09	428.11	422.61	429.88	429.69	430.80	425.06
MW-12D	429.68	424.40	426.15	424.48	434.52	428.31	422.59	426.02	428.22	421.19	419.06	433.27	433.08	426.27	421.18	428.03	429.09	429.47	422.28
MW-13S	430.71	425.51	427.26	426.06	434.71	428.74	424.39	429.81	429.99	422.56	420.69	433.86	434.01	427.72	422.19	429.61	429.87	430.92	423.72
MW-13D	428.44	423.15	424.94	423.59	432.40	426.59	421.99	427.09	427.46	420.19	418.51	431.52	431.67	425.14	419.94	427.24	427.51	428.49	421.02
MW-14S	436.19	430.41	431.40	429.25	440.20	434.01	428.64	433.52	434.06	426.59	--	439.78	439.07	431.41	428.95	435.92	434.23	436.78	427.61
MW-14D	434.39	428.22	429.09	427.49	437.99	432.14	425.94	431.39	432.57	424.64	422.29	437.49	437.96	429.98	424.56	432.11	433.02	433.71	425.62
MW-14R	365.14	353.64	359.94	364.62	369.01	358.48	357.45	363.58	367.26	353.71	356.41	367.43	370.08	361.66	357.41	363.07	361.57	364.23	356.24
MW-15S	435.67	430.51	432.28	429.28	439.47	433.68	428.35	433.24	433.73	426.76	424.13	438.50	438.08	431.26	425.81	432.17	433.77	435.26	427.85
MW-15D	432.69	427.17	428.09	426.83	436.69	431.09	424.84	430.74	431.22	423.52	421.22	436.22	436.74	429.26	423.32	430.06	431.88	432.47	424.48
MW-16S^	--	--	--	--	--	--	--	--	480.27	--	--	--	--	--	--	--	--	--	--
MW-16D^	--	--	--	--	--	--	--	--	480.73	--	--	--	--	--	--	--	--	--	--
MW-17S	429.62	425.87	426.76	424.97	432.14	428.19	423.27	428.32	428.32	422.89	419.36	431.47	431.13	426.26	421.39	427.17	428.07	428.79	423.68
MW-18S	412.44	407.58	411.58	409.12	416.43	411.60	407.83	414.83	411.79	407.61	406.26	414.98	414.43	410.10	407.05	410.91	411.52	412.35	408.14
MW-18D	413.47	407.74	411.68	409.08	417.47	413.02	407.87	411.39	412.91	407.55	405.85	416.58	417.24	411.20	406.88	411.58	413.46	412.99	408.07
MW-19S	436.36	431.90	434.01	431.93	440.32	436.91	430.03	436.81	435.88	428.73	426.51	439.11	437.80	432.26	428.69	434.19	433.55	435.23	432.43
MW-19D	435.35	--	421.32	426.40	439.32	437.32	417.39	434.97	424.45	417.12	423.85	429.35	431.52	430.22	425.80	424.01	430.65	433.13	418.74
MW-20R	368.59	354.75	361.65	371.65	372.63	360.95	362.79	368.15	370.70	357.13	360.70	372.00	375.97	364.95	360.42	367.14	364.08	368.60	358.40
MW-22U	410.77	405.65	418.81	407.67	414.82	410.16	403.62	411.81	411.84	411.84	411.85	412.67	412.59	411.88	411.83	411.81	411.85	411.83	411.89
MW-22L	409.45	404.32	408.86	404.73	413.40	408.95	402.35	410.29	409.16	404.13	402.75	412.50	413.46	407.69	403.53	407.67	409.97	409.47	404.66
MW-23S	--	426.52	427.77	426.28	427.29	427.45	--	--	428.10	424.24	--	431.34	430.21	426.61	423.47	428.87	427.49	--	--
MW-23D	426.45	421.45	423.18	422.05	430.98	424.81	420.99	427.52	425.60	419.15	416.35	429.00	433.87	423.03	417.92	426.80	426.79	--	--
MW-25S	405.68	400.97	401.44	399.76	408.85	405.19	399.10	403.28	404.56	398.59	397.52	409.97	411.10	402.60	397.97	402.46	406.00	--	--
MW-25D	407.27	403.32	403.66	402.27	410.54	408.36	401.15	405.15	406.34	400.50	398.73	410.44	411.85	404.79	399.68	404.88	407.47	--	--
MW-26R	--	418.82	419.09	418.39	427.32	357.75	--	360.40	361.98	352.63	354.20	368.00	372.30	398.40	357.60	364.89	362.69	422.28	414.02
MW-27S	429.31	423.86	422.84	424.21	433.28	429.46	421.79	429.16	428.21	419.19	416.61	433.21	433.70	425.59	418.07	427.13	429.09	--	--
MW-27D	429.02	423.92	424.08	424.12	433.00	428.92	421.85	428.93	428.07	419.91	416.92	433.20	433.70	425.65	419.19	427.19	428.99	--	--
MW-28S	--	--	424.77	--	--	--	--	--	426.37	422.17	422.17	428.97	428.38	423.79	421.70	426.51	426.21	--	--
MW-29S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	436.75	430.03
BC-4S	407.45	404.75	406.19	402.82	411.49	408.37	397.25	409.48	407.25	402.05	400.65	410.54	416.06	405.55	401.20	405.84	407.63	407.29	402.56
BC-4R	374.31	--	--	--	377.96	389.91	--	372.61	375.23	390.99	389.65	376.57	--	372.19	368.11	--	373.76	373.86	367.83
FMMW-1	405.73	402.38	400.13	400.41	409.73	405.28	398.81	403.45	404.67	398.88	398.01	409.03	409.90	402.92	398.38	402.88	405.85	403.93	399.19
FMMW-2	406.087	403.59	402.14	402.26	410.36	406.46	400.49	405.11	406.14	400.64	399.30	409.77	410.57	404.42	399.83	404.40	406.67	405.66	401.22

Water Level Measurements
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	01/16/19	08/22/19	01/22/20	08/25/20	01/20/21	08/03/21	01/18/22	08/24/22	01/24/23	07/18/23
MW-10S	*	*	*	*	439.81	434.25	439.558	435.14	435.25	431.40
MW-10D	430.33	425.65	431.54	426.29	438.14	429.99	437.808	431.64	431.59	427.84
MW-11S	424.78	421.08	425.83	421.58	430.98	424.08	431.555	425.78	425.93	422.86
MW-11D	424.65	419.95	425.72	421.47	430.88	424.00	431.402	425.70	--	--
MW-11D(2)	423.28	419.56	424.68	420.46	431.16	423.12	431.051	425.14	424.58	420.35
MW-12S	426.01	420.79	427.16	422.47	431.95	425.91	432.896	433.66	428.13	424.23
MW-12D	423.07	418.90	424.27	420.22	430.50	422.78	430.866	424.78	424.35	421.17
MW-13S	424.47	420.54	425.81	420.55	431.39	424.16	432.125	425.41	430.94	422.84
MW-13D	423.99	417.99	423.27	417.88	429.29	421.64	430.64	423.19	423.90	420.14
MW-14S	428.50	Dry	426.63	Dry	426.10	428.00	436.298	429.81	430.20	426.70
MW-14D	426.44	422.27	427.67	423.68	434.39	425.89	434.1	428.26	427.79	424.28
MW-14R	359.47	352.16	358.24	356.07	365.28	359.66	366.304	358.99	361.06	355.47
MW-15S	428.58	424.39	429.54	425.66	430.65	428.38	435.97	429.93	430.23	427.00
MW-15D	425.25	421.06	426.44	422.49	433.62	425.04	433.34	427.24	426.63	423.18
MW-16S^	--	--	--	--	--	--	--	--	--	--
MW-16D^	--	--	--	--	--	--	--	--	--	--
MW-17S	424.51	419.87	425.26	421.57	429.92	424.07	430.914	425.67	426.47	422.95
MW-18S	408.71	406.40	409.63	406.93	414.92	408.59	414.906	409.82	408.04	407.83
MW-18D	408.39	405.77	409.10	406.68	414.49	408.37	415.335	409.89	409.62	407.38
MW-19S	431.23	426.79	433.78	427.82	437.50	433.29	440.892	435.98	--	--
MW-19D	421.33	421.43	422.69	415.99	428.88	420.25	428.5	422.35	--	--
MW-20R	362.56	355.04	362.16	358.74	369.95	362.10	370.749	361.39	363.70	357.75
MW-22U	411.81	411.80	411.83	411.83	417.31	412.01	412.558	549.17	--	--
MW-22L	404.94	402.76	405.61	403.48	411.04	404.95	411.796	406.34	--	--
MW-23S	--	--	--	--	--	--	--	--	--	--
MW-23D	--	--	--	--	--	--	--	--	--	--
MW-25S	--	--	--	--	--	--	--	--	--	--
MW-25D	--	--	--	--	--	--	--	--	--	--
MW-26R	414.51	409.60	414.75	410.71	421.34	412.70	419.98	413.91	361.89	409.75
MW-27S	--	--	--	--	--	--	--	--	--	--
MW-27D	--	--	--	--	--	--	--	--	--	--
MW-28S	--	--	--	--	--	--	--	--	--	--
MW-29S	430.85	427.30	431.98	428.07	436.95	430.54	438.454	433.25	433.15	429.74
BC-4S	402.88	400.63	403.73	401.24	408.70	402.75	392.486	386.11	404.11	401.60
BC-4R	369.35	*	368.44	*	374.52	369.65	399.502	393.47	370.28	*
FMMW-1	399.06	398.19	399.46	398.42	406.13	399.39	425.583	420.01	401.08	398.86
FMMW-2	400.92	399.52	401.50	399.89	407.40	401.49	385.107	379.78	402.88	400.33

Appendix D

GROUNDWATER MONITORING DATA

Table 2. Water Level Elevations
Semi-Annual Monitoring Event No. 1 - January 2023
Hidden Valley Landfill, Pierce County, Washington

Location	Well Casing Elevation	Depth to Water (FT)	Water Level Elevation
Shallow Perched Aquifer			
MW-10S	463.65	28.40	435.25
MW-11S	520.03	94.10	425.93
MW-12S	493.41	65.28	428.13
MW-13S	452.26	21.32	430.94
MW-14S	481.30	51.10	430.20
MW-15S	506.78	76.55	430.23
MW-17S	555.97	129.50	426.47
MW-18S	541.43	133.39	408.04
MW-29S	450.65	17.50	433.15
FMMW-1	546.03	144.95	401.08
FMMW-2	539.96	137.08	402.88
BC-4S	530.25	125.71	404.54
Upper Regional Aquifer			
MW-10D	464.09	32.50	431.59
MW-11D	520.10		520.10
MW-11D(2)	519.53	94.95	424.58
MW-12D	493.49	69.14	424.35
MW-13D	450.19	26.29	423.90
MW-14D	481.39	53.60	427.79
MW-15D	509.09	82.46	426.63
MW-18D	541.79	132.17	409.62
Lower Regional Aquifer			
MW-14R	480.26	119.20	361.06
MW-20R	472.90	109.20	363.70
MW-26R	485.40	123.51	361.89
BC-4R	530.31	161.63	368.68

Table 3. Field Parameters
Semi-Annual Monitoring Event No. 1 - January 2023
Hidden Valley Landfill, Pierce County, Washington

Location	Sample Number	Date	Method	pH	Specific Conductivity	Temperature
Units				(SU)	(µS/cm)	(°C)
HVL Cleanup Level				—	700	—
WAC 173-200				6.5-8.5	700[b]	—
Shallow Perched Aquifer						
(BG) MW-10S	HVL-012423-11	1/24/23	DP	**6.49**	263	12.5
MW-11S	HVL-012523-02	1/25/23	DP	**5.76**	302	14.0
MW-12S	HVL-012523-20	1/25/23	DB	**6.06**	291	16.6
MW-13S	HVL-012623-24	1/26/23	DP	**6.15**	202	11.5
MW-14S	HVL-012423-01	1/24/23	DP	**6.02**	325	13.5
MW-15S	HVL-012423-07	1/24/23	DP	**5.73**	307	15.1
MW-17S	HVL-012423-27	1/24/23	DP	**5.64**	418	17.6
MW-18S	HVL-012523-10	1/25/23	DP	**6.21**	344	14.5
MW-29S	HVL-012623-26	1/26/23	DP	**6.24**	255	12.7
FMMW-1	HVL-012523-21	1/25/23	DP	**6.18**	222	14.1
FMMW-2	HVL-012523-23	1/25/23	DP	**5.90**	405	16.1
Upper Regional Aquifer						
(BG) MW-10D	HVL-012423-11	1/24/23	DP	6.51	277	12.1
MW-11D(2)	HVL-012523-02	1/25/23	DP	6.61	202	13.5
MW-12D	HVL-012523-20	1/25/23	DP	6.74	343	15.9
MW-13D	HVL-012623-24	1/26/23	DP	**6.32**	269	12.3
MW-14D	HVL-012423-01	1/24/23	DP	**6.29**	304	12.9
MW-15D	HVL-012423-07	1/24/23	DP	**6.24**	284	13.7
MW-18D	HVL-012423-27	1/24/23	DP	6.78	246	14.5
Lower Regional Aquifer						
MW-14R	HVL-012423-05	1/24/23	DP	7.53	108	11.1
MW-20R	HVL-012423-14	1/24/23	DP	6.50	100	10.5
MW-26R	HVL-012423-12	1/24/23	DP	6.81	219	11.4

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**

b = Secondary Drinking Water Standard

BG = Background Monitoring Well

°C = degrees Celsius

DP = dedicated bladder pump

DB = disposable bailer

µS/cm = microsiemens per centimeter

— = not analyzed or not applicable

Table 4. Inorganic Parameters
Semi-Annual Monitoring Event No. 1 - January 2023
Hidden Valley Landfill, Pierce County, Washington

Location		Alkalinity, Total	Ammonia	Chloride	Nitrate	Sulfate	Total Dissolved Solids	Total Organic Carbon	Total Suspended Solids
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL		10.0	0.10	0.2-1.2	0.20	0.2-1.0	10	1.0	4.0
HVL Cleanup Level		—	—	250	10	250	500	—	—
WAC 173-200 Criteria		—	—	250[b]	10[a]	250[b]	500[b]	—	—
Shallow Perched Aquifer									
(BG)	MW-10S	94	*	8.3	*	10	—	1	*
	MW-11S	100	*	34	3.9	8.4	32	1.5	*
	MW-12S	56	1.1	11	8.0	15	150	1.9	6.0
	MW-13S	61	*	15	1.9	10	120	1.2	*
	MW-14S	48	0.53	20	*	3.2	—	2.6	*
	MW-15S	140	2.9	9	*	3.2	—	1.7	*
	MW-17S	160	5	12	*	10	—	1.8	*
	MW-18S	180	*	14	4.9	14	160	1.6	*
	MW-29S	120	*	12	*	15	130	1.2	4.4
	FMMW-1	92	*	9.2	1.3	14	140	1.8	*
	FMMW-2	130	*	21	10	8.8	24	7.8	*
Upper Regional Aquifer									
(BG)	MW-10D	76	*	5.2	1.8	8.0	—	1.0	*
	MW-11D(2)	87	*	5.6	1.9	8.7	140	*	*
	MW-12D	140	*	9.0	0.92	7.7	170	1.1	*
	MW-13D	110	*	13	1.4	12	110	*	*
	MW-14D	98	3.4	12	*	9.8	—	1.8	*
	MW-15D	130	*	9.1	*	10	—	*	*
	MW-18D	110	*	6.9	1.8	8.1	100	*	*
Lower Regional Aquifer									
	MW-14R	53	*	1.8	*	4.2	—	*	*
	MW-20R	46	*	1.8	*	3.6	—	*	*
	MW-26R	100	*	5.3	*	11	—	*	*

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**

Analyses performed by Eurofins TestAmerica in Denver, Colorado

H = Due to a Fedex shipping delay, parameter analyzed outside specified holding time

— = not analyzed or not applicable

* = not reported at or above the MRL (Method Reporting Limit)

a = Primary Drinking Water Standard

b = Secondary Drinking Water Standard

BG = Background monitoring well

mg/L = milligrams per liter

Table 5. Dissolved Metals
Semi-Annual Monitoring Event No. 1 - January 2023
Hidden Valley Landfill, Pierce County, Washington

Location	Iron	Manganese	Calcium	Magnesium	Potassium	Sodium
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL	0.005	0.001	0.20	0.10	2.0	1.0
HVL Cleanup Level	0.30	0.05	—	—	—	—
WAC 173-200 Criteria	0.30[b]	0.05[b]	—	—	—	—
Shallow Perched Aquifer						
(BG) MW-10S	*	*	34	10	2.2	9.2
MW-11S	*	*	25	7.5	5.7	20
MW-12S	0.007	0.006	23	6.6	10	17
MW-13S	*	*	21	5.9	2.9	11
MW-14S	*	0.13	32	9.5	6.8	20
MW-15S	0.017	**1.2**	25	7.7	9.1	16
MW-17S	*	**1.4**	28	9.2	15	21
MW-18S	*	*	31	9.3	8.0	21
MW-29S	0.12	**0.70**	25	7.3	3.3	22
FMMW-1	*	*	19	5.4	2.8	18
FMMW-2	*	*	35	11	12	24
Upper Regional Aquifer						
(BG) MW-10D	*	*	36	11	2.2	9.5
MW-11D(2)	*	*	20	8.7	2.3	8.2
MW-12D	*	*	33	13	3.2	21
MW-13D	*	*	27	10	2.6	11
MW-14D	**4.7**	**1.5**	27	8.1	8.3	14
MW-15D	*	0.0043	27	11	3.0	19
MW-18D	*	*	24	9.7	2.9	12
Lower Regional Aquifer						
MW-14R	0.041	**0.19**	8.8	5.0	2.2	5.7
MW-20R	*	0.006	8.8	4.5	2.3	6.0
MW-26R	**0.74**	**0.45**	23	10	2.5	6.9

Notes:

Parameter concentrations that are greater than site cleanup levels or WAC 173-200 criteria are shown in **bold**

Analyses performed by Eurofins TestAmerica in Denver, Colorado

BG = Background Monitoring Well

mg/L = milligrams per liter

* = not reported at or above the MRL (Method Reporting Limit)

— = not analyzed or not applicable

Table 6. Volatile Organic Compounds
Semi-Annual Monitoring Event No. 1 - January 2023
Hidden Valley Landfill, Pierce County, Washington

Location		Tetrachloroethene
Units		µg/L
MRL		0.5
HVL Cleanup Level		—
WAC 173-200 Criteria		0.80
Shallow Perched Aquifer		
(BG)	MW-10S	*
	MW-11S	*
	MW-12S	*
	MW-13S	*
	MW-14S	*
	MW-15S	*
	MW-17S	*
	MW-18S	*
	MW-29S	*
	FMMW-1	*
	FMMW-2	*
Upper Regional Aquifer		
(BG)	MW-10D	*
	MW-11D(2)	**1.0**
	MW-12D	*
	MW-13D	*
	MW-14D	*
	MW-15D	**0.92**
	MW-18D	*
Lower Regional Aquifer		
	MW-14R	*
	MW-20R	*
	MW-26R	*
Quality Control Samples		
	Field Blank	*
	Trip Blank	*

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**

Analyses performed by Eurofins TestAmerica in Denver, Colorado

Volatile organic compounds not listed were not present at concentrations exeeding the MRL

BG = Background

µg/L = micrograms per liter

* = not reported at or above the MRL (Method Reporting Limit)

— = not analyzed or not applicable

Table 7. Duplicate Sample Evaluation
Semi-Annual Monitoring Event No. 1 - January 2023
Hidden Valley Landfill, Pierce County, Washington

Parameter	MRL	MW-11S	MW-11S (Duplicate)	RPD (%)
Dissolved Metals (mg/L)				
Calcium	0.2	25	25	0.0
Magnesium	0.1	7.5	7.6	1.3
Potassium	2.0	5.7	5.8	1.7
Sodium	1.0	20	20	0.0
Inorganic Parameters (mg/L)				
Alkalinity	10.0	81	80	1.2
Chloride	0.6	34	34	0.0
Nitrate	0.2	3.9	3.9	0.0
Sulfate	0.5	8.4	8.4	0.0
Total Dissolved Solids	10	32	140	125.6
Total Organic Carbon	1.0	1.5	1.4	6.9

Notes:

Analysis performed by Eurofins TestAmerica in Denver, Colorado

Analytes not listed were not present at concentrations exceeding the MRL

H = Parameter analyzed outside specified holding time

RPD = relative percent difference

mg/L = milligrams per liter

*= RPD based on result as compared to the Reporting Limit (RL) for a non-detection in the compared sample

Table 8. Water Supply Wells
Semi-Annual Monitoring Event No. 1 - January 2023
Hidden Valley Landfill, Pierce County, Washington

Parameter	Units	MRL	Corliss	Paul Bunyan
Field Parameters				
pH	SU	—	7.32	7.36
Specific Conductivity	µS/cm	—	187	295
Temperature	°C	—	8.8	9.7
Volatile Organic Compounds				
2-Butanone (MEK)	µg/L	0.5	*	*
Acetone	µg/L	0.5	*	*
Metals (total)				
Arsenic	mg/L	0.005	*	*
Iron	mg/L	0.01	0.260	0.013
Manganese	mg/L	0.001	*	*
Zinc	mg/L	0.01	0.024	*
Inorganic Parameters				
Ammonia	mg/L	0.1	*	*
Chemical Oxygen Demand	mg/L	10	—	—
Chloride	mg/L	1.2	7.3	5.6
Nitrate	mg/L	0.2	2.1	1.0
Nitrite	mg/L	0.5	*	*
Sulfate	mg/L	0.2	12	14
Total Organic Carbon	mg/L	1.0	*	*
Other				
Color	PCU	5.0	*	*

Notes:

Analyses performed by Eurofins TestAmerica in Denver, Colorado.

Analytes not listed are VOCs that were not detected above the reporting limit.

Color reported in color units

°C = degrees Celsius

mg/L = milligrams per liter

PCU = platinum-cobalt units

SU = Standard Units

µS/cm = microsiemens per centimeter

µg/L = micrograms per liter

* = not reported at or above the MRL (Method Reporting Limit)

— = Not Applicable

^ = The Paul Bunyon water supply well was resampled on 3/31/22

Table 9. Cation-Anion Balance
Semi-Annual Monitoring Event No. 1 - January 2023
Hidden Valley Landfill, Pierce County, Washington

Cations	mg/L					meq/L					% of Total		
	Ca	Mg	K	Na	Total	Ca	Mg	K	Na	Total	Na+K	Ca	Mg
MW-10S	34	10	2.2	9.2	55.40	1.70	0.82	0.06	0.40	2.98	15	57	28
MW-11S	25	7.5	5.7	20	58.20	1.25	0.62	0.15	0.87	2.88	35	43	21
MW-12S	23	6.6	10	17	56.60	1.15	0.54	0.26	0.74	2.69	37	43	20
MW-13S	21	5.9	2.9	11	40.80	1.05	0.49	0.07	0.48	2.09	26	50	23
MW-14S	32	9.5	6.8	20	68.30	1.60	0.78	0.17	0.87	3.42	31	47	23
MW-15S	25	7.7	9.1	16	57.80	1.25	0.63	0.23	0.70	2.81	33	44	23
MW-17S	28	9.2	15	21	73.20	1.40	0.76	0.38	0.91	3.45	38	40	22
MW-18S	31	9.3	8.0	21	69.30	1.55	0.77	0.20	0.91	3.43	33	45	22
MW-29S	25	7.3	3.3	22	57.60	1.25	0.60	0.08	0.96	2.89	36	43	21
FMMW-1	19	5.4	2.8	18	45.20	0.95	0.44	0.07	0.78	2.25	38	42	20
FMMW-2	35	11	12	24	82.00	1.75	0.91	0.31	1.04	4.00	34	44	23
MW-10D	36	11	2.2	9.5	58.70	1.80	0.91	0.06	0.41	3.17	15	57	29
MW-11D(2)	20	8.7	2.3	8.2	39.20	1.00	0.72	0.06	0.36	2.13	20	47	34
MW-12D	33	13	3.2	21	70.20	1.65	1.07	0.08	0.91	3.71	27	44	29
MW-13D	27	10	2.6	11	50.60	1.35	0.82	0.07	0.48	2.72	20	50	30
MW-14D	27	8.1	8.3	14	57.40	1.35	0.67	0.21	0.61	2.84	29	48	24
MW-15D	27	11	3.0	19	60.00	1.35	0.91	0.08	0.83	3.16	29	43	29
MW-18D	24	9.4	2.9	12	48.30	1.20	0.77	0.07	0.52	2.57	23	47	30
MW-14R	8.8	5.0	2.2	5.7	21.70	0.44	0.41	0.06	0.25	1.15	26	38	36
MW-20R	8.8	4.5	2.3	6.0	21.60	0.44	0.37	0.06	0.26	1.13	28	39	33
MW-26R	23	10	2.5	6.9	42.40	1.15	0.82	0.06	0.30	2.33	16	49	35

Anions	mg/L					meq/L					% of Total			Total Ions (meq/L)	Cation - Anion Balance	Applicable Ratio (%)	Ratio Exceedance
	Alk	Cl	NO_3	SO_4	Total	Alk	Cl	NO_3	SO_4	Total	Cl	Alk	SO_4				
MW-10S	94	8.3	0.20	10	112.50	1.54	0.23	0.00	0.21	1.99	12	78	10	4.96	19.93	10	Exceeds
MW-11S	100	34	3.9	8.4	146.30	1.64	0.96	0.06	0.17	2.84	34	58	6	5.72	0.78	5	-
MW-12S	56	11	8.0	15	90.00	0.92	0.31	0.13	0.31	1.67	19	55	19	4.36	23.35	10	Exceeds
MW-13S	61	15	1.9	9.8	87.70	1.00	0.42	0.03	0.20	1.66	26	60	12	3.74	11.44	10	Exceeds
MW-14S	48	20	0.20	3.2	71.40	0.79	0.56	0.00	0.07	1.42	40	55	5	4.84	41.33	10	Exceeds
MW-15S	140	9.2	0.20	3.2	152.60	2.30	0.26	0.00	0.07	2.63	10	87	3	5.44	3.40	5	-
MW-17S	160	12	0.20	10.0	182.20	2.62	0.34	0.00	0.21	3.17	11	83	7	6.63	4.20	5	-
MW-18S	180	14	4.9	14	212.90	2.95	0.39	0.08	0.29	3.72	11	79	8	7.15	4.01	5	-
MW-29S	120	12	0.20	15	147.20	1.97	0.34	0.00	0.31	2.62	13	75	12	5.51	4.87	5	-
FMMW-1	92	9.2	1.3	14	116.50	1.51	0.26	0.02	0.29	2.08	12	73	14	4.33	3.86	10	-
FMMW-2	130	21	10	8.8	169.80	2.13	0.59	0.16	0.18	3.07	19	69	6	7.07	13.22	5	Exceeds
MW-10D	76	5.2	1.8	8.0	91.00	1.25	0.15	0.03	0.17	1.59	9	78	10	4.76	33.26	10	Exceeds
MW-11D(2)	87	5.6	1.9	8.7	103.20	1.43	0.16	0.03	0.18	1.80	9	79	10	3.93	8.49	10	-
MW-12D	140	9.0	0.92	7.7	157.62	2.30	0.25	0.01	0.16	2.72	9	84	6	6.44	15.34	5	Exceeds
MW-13D	110	13	1.4	12	136.40	1.80	0.37	0.02	0.25	2.44	15	74	10	5.16	5.29	5	Exceeds
MW-14D	98	12	0.20	9.8	120.00	1.61	0.34	0.00	0.20	2.15	16	75	9	4.99	13.69	10	Exceeds
MW-15D	130	9.1	0.20	10	149.30	2.13	0.26	0.00	0.21	2.60	10	82	8	5.76	9.66	5	Exceeds
MW-18D	110	6.9	1.8	8.1	126.80	1.80	0.19	0.03	0.17	2.20	9	82	8	4.76	7.80	10	-
MW-14R	53	1.8	0.20	4.2	59.20	0.87	0.05	0.00	0.09	1.01	5	86	9	2.17	6.67	10	-
MW-20R	46	1.8	0.20	3.6	51.60	0.75	0.05	0.00	0.07	0.88	6	85	8	2.01	12.23	10	Exceeds
MW-26R	100	5.3	0.20	11.0	116.50	1.64	0.15	0.00	0.23	2.02	7	81	11	4.36	7.19	10	-

Notes:
mg/L = milligrams per liter
meq/L = milliequivalents per liter
Total alkalinity concentration, reported as calcium carbonate (CaCO3), is converted to the bicarbonate (HCO3-) ion by multiplying by a factor of 1.2.
Cation / anion balance equation is the equivalent percent difference in cations minus anions divided by the sum of cations and anions [(cations-anions)/(anions+cations)*100].
The MRL was used for analytes that were non-detect
A 10% difference threshold is used if the total cation-anion sums are < 5.0 meq/liter.
A 5% difference threshold is used if the total cation-anion sums are > or = to 5.0 meq/liter.
— = Not Applicable

Table 1. 2023 Main Sump and Side-Slope Liner Area Performance Data
Semi - Annual Monitoring Event No. 2 - July 2023
Hidden Valley Landfill, Pierce County, Washington

Month	Main Sump Monthly Leachate Volume - Cell 1 (gallons)	Side-Slope Sump Monthly Leachate Volume - Cell 2 (gallons)	Side-Slope Sump Monthly Leakage Flow[a] - Cell 2 (gallons/month)	Monthly Rainfall (inches)
January	13,521	698	0	4.85
February	12,123	952	0	6.00
March	7,827	11	0	5.20
April	11,547	0	0	9.35
May	18,929	0	0	1.85
June	6,706	0	0	2.80
July	1,790	0	0	0.20
August	3,077	0	0	0.35
September	11,908	0	0	3.80
October	3,397	0	0	5.10
November	1,270	0	0	6.58
December	10,160	0	0	14.35
Year to date:	102,255	1,661	0	60.43

Notes:

a = Leakage is fluid pumped from the leak detection sump as recorded by LRI staff.

Table 2. Water Level Elevations - July 18, 2023
Semi - Annual Monitoring Event No. 2 - July 2023
Hidden Valley Landfill, Pierce County, Washington

Location	Well Casing Elevation	Depth to Water (FT)	Water Level Elevation
Shallow Perched Aquifer			
MW-10S	463.65	32.25	431.40
MW-11S	520.03	97.17	422.86
MW-12S	493.41	69.18	424.23
MW-13S	452.26	29.42	422.84
MW-14S	481.30	54.60	426.70
MW-15S	506.78	79.78	427.00
MW-17S	555.97	133.02	422.95
MW-18S	541.43	133.60	407.83
MW-29S	450.65	20.91	429.74
FMMW-1	546.03	139.63	406.40
FMMW-2	539.96	147.17	392.79
BC-4S	530.25	126.14	404.11
Upper Regional Aquifer			
MW-10D	464.09	36.25	427.84
MW-11D	520.10		520.10
MW-11D(2)	519.53	99.18	420.35
MW-12D	493.49	72.32	421.17
MW-13D	450.19	30.05	420.14
MW-14D	481.39	57.11	424.28
MW-15D	509.09	85.91	423.18
MW-18D	541.79	134.41	407.38
Lower Regional Aquifer			
MW-14R	480.26	124.79	355.47
MW-20R	472.90	115.15	357.75
MW-26R	485.40	75.65	409.75
BC-4R	530.31	160.03	370.28

Updated well casing elevation with survey data from 5/23/2018

Table 3. Field Parameters
Semi - Annual Monitoring Event No. 2 - July 2023
Hidden Valley Landfill, Pierce County, Washington

Location	Sample Number	Date	Method	pH	Specific Conductivity	Temperature
Units				(SU)	(µS/cm)	(°C)
HVL Cleanup Level				—	700	—
WAC 173-200				6.5-8.5	700[b]	—
Shallow Perched Aquifer						
(BG) MW-10S	HVL-071923-11	7/19/23	DP	**6.25**	308	13.4
MW-11S	HVL-071823-02	7/18/23	DP	**5.90**	299	14.5
MW-12S	HVL-071923-20	7/19/23	DB	**6.08**	287	18.4
MW-13S	HVL-071823-24	7/18/23	DP	**5.85**	186	11.8
MW-14S	HVL-071823-01	7/18/23	DP	**6.04**	383	15.6
MW-15S	HVL-071923-07	7/19/23	DP	**6.20**	276	16.3
MW-17S	HVL-071923-27	7/19/23	DP	**6.05**	349	19.0
MW-18S	HVL-071923-10	7/19/23	DP	**6.04**	289	16.6
MW-29S	HVL-071823-26	7/18/23	DP	**6.31**	283	13.6
FMMW-1	HVL-071823-23	7/18/23	DP	**6.25**	363	17.6
FMMW-2	HVL-071823-21	7/18/23	DP	6.51	249	16.5
Upper Regional Aquifer						
(BG) MW-10D	HVL-071823-16	7/19/23	DP	**6.33**	330	13.7
MW-11D(2)	HVL-071823-06	7/18/23	DP	6.94	211	14.6
MW-12D	HVL-071923-18	7/19/23	DP	**6.46**	385	16.2
MW-13D	HVL-071823-22	7/18/23	DP	**6.10**	229	12.6
MW-14D	HVL-071823-03	7/18/23	DP	**5.97**	372	14.3
MW-15D	HVL-071923-09	7/19/23	DP	6.68	288	15.1
MW-18D	HVL-071923-08	7/19/23	DP	6.67	268	16.4
Lower Regional Aquifer						
MW-14R	HVL-071923-05	7/19/23	DP	8.07	100	13.1
MW-20R	HVL-071923-14	7/19/23	DP	7.18	97	10.9
MW-26R	HVL-071923-12	7/19/23	DP	7.77	213	11.6

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**

b = Secondary Drinking Water Standard
BG = Background
°C = degrees Celsius
DP = dedicated bladder-pump
DB = disposable bailer
µS/cm = microsiemens per centimeter
— = not analyzed or not applicable

Table 4. Inorganic Parameters
Semi - Annual Monitoring Event No. 2 - July 2023
Hidden Valley Landfill, Pierce County, Washington

Location		Alkalinity, Total	Ammonia	Chloride	Nitrate	Sulfate	Total Dissolved Solids	Total Organic Carbon	Total Suspended Solids
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL		10.0	0.1	0.2-1.2	0.2	0.2-1.0	10	1.0	4.0
HVL Cleanup Level		—	—	250	10	250	500	—	—
WAC 173-200 Criteria		—	—	250[b]	10[a]	250[b]	500[b]	—	—
Shallow Perched Aquifer									
(BG)	MW-10S	*	*	8.3	*	10	*	1	*
	MW-11S	81	*	34	3.9	8.4	32	1.5	*
	MW-12S	81	1.1	11	8	15	150	1.9	6
	MW-13S	62	*	15	1.9	9.8	120	1.2	*
	MW-14S	*	0.53	20	*	3.2	*	2.6	*
	MW-15S	*	2.9	9.2	*	3.2	*	1.7	*
	MW-17S	*	5	12	*	10	*	1.8	*
	MW-18S	130	*	14	4.9	14	160	1.6	*
	MW-29S	100	*	12	0.47	15	130	1.2	4.4
	FMMW-1	86	*	9.2	1.3	14	24	1.8	*
	FMMW-2	130	*	21	10	8.8	140	7.8	*
Upper Regional Aquifer									
(BG)	MW-10D	*	*	*	*	*	*	*	*
	MW-11D(2)	84	*	5.6	1.9	8.7	150	*	*
	MW-12D	160	*	9	0.92	7.7	170	1.1	*
	MW-13D	100	*	13	1.4	12	110	*	*
	MW-14D	*	3.4	12	*	9.8	*	1.8	*
	MW-15D	*	*	9.1	*	10	*	*	*
	MW-18D	100	*	6.9	1.8	8.1	100	*	*
Lower Regional Aquifer									
	MW-14R	*	*	1.8	*	4.2	*	*	*
	MW-20R	*	*	1.8	*	3.6	*	*	*
	MW-26R	*	*	5.3	*	11	*	*	*

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**

Analyses performed by Eurofins TestAmerica in Denver, Colorado

H = Due to a Fedex shipping delay, parameter analyzed outside specified holding time

— = not analyzed or not applicable

* = not reported at or above the MRL (Method Reporting Limit)

a = Primary Drinking Water Standard

b = Secondary Drinking Water Standard

BG = Background/upgradient wells

mg/L = milligrams per liter

Table 5. Dissolved Metals
Semi - Annual Monitoring Event No. 2 - July 2023
Hidden Valley Landfill, Pierce County, Washington

Location	Iron	Manganese	Calcium	Magnesium	Potassium	Sodium
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL	0.005	0.001	0.2	0.1	2.0	1.0
HVL Cleanup Level	0.30	0.05	—	—	—	—
WAC 173-200 Criteria	0.30[b]	0.05[b]	—	—	—	—
Shallow Perched Aquifer						
(BG) MW-10S	ND	ND	34	11	2	9.2
MW-11S	ND	ND	24	7.5	5.7	20
MW-12S	0.04	**0.47**	23	6.6	10	17
MW-13S	ND	ND	21	5.2	2.9	11
MW-14S	**0.52**	**0.99**	35	11	6.8	20
MW-15S	0.15	**1.1**	25	7.7	9.1	14
MW-17S	0.0054	**1.2**	28	8.7	14	21
MW-18S	ND	ND	22	6.9	8	21
MW-29S	0.17	**0.42**	22	6.8	3.3	22
FMMW-1	ND	0.036	19	9.6	11	21
FMMW-2	ND	ND	35	11	3	18
Upper Regional Aquifer						
(BG) MW-10D	ND	ND	36	11	2.2	8.7
MW-11D(2)	ND	ND	20	8.7	2.2	7.4
MW-12D	ND	ND	33	13	3.2	21
MW-13D	ND	ND	27	7.9	2.5	11
MW-14D	**7.9**	**1.7**	29	9.3	8.3	14
MW-15D	ND	0.0023	25	11	3	19
MW-18D	0.011	ND	24	9.7	2.9	12
Lower Regional Aquifer						
MW-14R	0.047	**0.19**	8.8	4.7	2.1	5
MW-20R	ND	ND	7.8	4.5	2.3	6
MW-26R	**0.82**	**0.45**	22	10	2.4	6.9

Notes:

Parameter concentrations that are greater than site cleanup levels or WAC 173-200 criteria are shown in **bold**

Analyses performed by Eurofins TestAmerica in Denver, Colorado

BG = Background

mg/L = milligrams per liter

* = not reported at or above the MRL (Method Reporting Limit)

— = not analyzed or not applicable

Table 6. Volatile Organic Compounds
Semi - Annual Monitoring Event No. 2 - July 2023
Hidden Valley Landfill, Pierce County, Washington

Location		Tetrachloroethene
Units		µg/L
MRL		0.5
HVL Cleanup Level		—
WAC 173-200 Criteria		0.80
Shallow Perched Aquifer		
(BG)	MW-10S	*
	MW-11S	*
	MW-12S	*
	MW-13S	*
	MW-14S	*
	MW-15S	*
	MW-17S	*
	MW-18S	*
	MW-29S	*
	FMMW-1	*
	FMMW-2	*
Upper Regional Aquifer		
(BG)	MW-10D	*
	MW-11D(2)	**1.3**
	MW-12D	*
	MW-13D	*
	MW-14D	*
	MW-15D	**1.0**
	MW-18D	*
Lower Regional Aquifer		
	MW-14R	*
	MW-20R	*
	MW-26R	*
Quality Control Samples		
	Field Blank	*
	Trip Blank	*

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**

Analyses performed by Eurofins TestAmerica in Denver, Colorado

Volatile organic compounds not listed were not present at concentrations exeeding the MRL

BG = Background

µg/L = micrograms per liter

* = not reported at or above the MRL (Method Reporting Limit)

— = not analyzed or not applicable

Table 7. Duplicate Sample Evaluation
Semi - Annual Monitoring Event No. 2 - July 2023
Hidden Valley Landfill, Pierce County, Washington

Parameter	MRL	MW-11D(2)	MW-11D(2) (Duplicate)	RPD (%)
Dissolved Metals (mg/L)				
Calcium	0.2	19	19	0.0
Magnesium	0.1	8.4	8.5	1.2
Potassium	2.0	2.2	2.1	4.7
Sodium	1.0	7.4	7.5	1.3
Inorganic Parameters (mg/L)				
Alkalinity	10.0	81	83	2.4
Chloride	0.6	6.6	6.7	1.5
Nitrate as N	0.2	1.8	1.9	5.4
Sulfate	0.5	8.8	8.7	1.1
Total Dissolved Solids	10	150	140	6.9
Total Suspended Solids	4	4	4	0.0
Volatile Organic Compounds (ug/L)				
Tetrachloroethene	0.5	1.3	1.2	8.0

Notes:

Analysis performed by Eurofins TestAmerica in Denver, Colorado

Analytes not listed were not present at concentrations exceeding the MRL

H = Parameter analyzed outside specified holding time

RPD = relative percent difference

mg/L = milligrams per liter

*= RPD based on result as compared to the Reporting Limit (RL) for a non-detection in the compared sample

Table 8. Water Supply Wells
Semi - Annual Monitoring Event No. 2 - July 2023
Hidden Valley Landfill, Pierce County, Washington

Parameter	Units	MRL	Corliss	Paul Bunyan
Field Parameters				
pH	SU	—	7.10	7.07
Specific Conductivity	µS/cm	—	310	306
Temperature	°C	—	32.2	18.13
Volatile Organic Compounds				
2-Butanone (MEK)	µg/L	0.5	*	*
Acetone	µg/L	0.5	*	*
Metals (total)				
Arsenic	mg/L	0.005	*	*
Iron	mg/L	0.01	0.0087	0.15
Manganese	mg/L	0.001	*	*
Zinc	mg/L	0.01	0.014	0.025
Inorganic Parameters				
Ammonia	mg/L	0.1	*	*
Chemical Oxygen Demand	mg/L	10	—	—
Chloride	mg/L	1.2	7.0	8.8
Nitrate	mg/L	0.2	0.94	1.9
Nitrite	mg/L	0.5	*	*
Sulfate	mg/L	0.2	14	13
Total Organic Carbon	mg/L	1.0	*	*
Other				
Color	PCU	5.0	*	*

Notes:

Analyses performed by Eurofins TestAmerica in Denver, Colorado.

Analytes not listed are VOCs that were not detected above the reporting limit.

Color reported in color units

°C = degrees Celsius

mg/L = milligrams per liter

PCU = platinum-cobalt units

SU = Standard Units

µS/cm = microsiemens per centimeter

µg/L = micrograms per liter

* = not reported at or above the MRL (Method Reporting Limit)

— = Not Applicable

^ = The Paul Bunyon water supply well was resampled on 3/31/22

Table 9. Cation-Anion Balance
Semi - Annual Monitoring Event No. 2 - July 2023
Hidden Valley Landfill, Pierce County, Washington

Cations	mg/L					meq/L					% of Total		
	Ca	Mg	K	Na	Total	Ca	Mg	K	Na	Total	Na+K	Ca	Mg
MW-10S	34	11	2.0	8.5	55.50	1.70	0.91	0.05	0.37	3.02	14	56	30
MW-11S	24	7.5	6	18	55.50	1.20	0.62	0.15	0.78	2.75	34	44	22
MW-12S	21	6.3	10	16	53.30	1.05	0.52	0.26	0.70	2.52	38	42	21
MW-13S	18	5.2	2.5	8.5	34.20	0.90	0.43	0.06	0.37	1.76	25	51	24
MW-14S	35	11	6.9	20	72.90	1.75	0.91	0.18	0.87	3.70	28	47	24
MW-15S	22	7.0	8.5	14	51.50	1.10	0.58	0.22	0.61	2.50	33	44	23
MW-17S	26	8.7	14	20	68.70	1.30	0.72	0.36	0.87	3.24	38	40	22
MW-18S	22	6.9	8	18	54.60	1.10	0.57	0.20	0.78	2.65	37	41	21
MW-29S	22	6.8	2.5	21	52.30	1.10	0.56	0.06	0.91	2.63	37	42	21
FMMW-1	29	9.6	11.0	21	70.60	1.45	0.79	0.28	0.91	3.43	35	42	23
FMMW-2	19	5.7	3	18	45.70	0.95	0.47	0.08	0.78	2.28	38	42	21
MW-10D	36	11	2.1	8.7	57.80	1.80	0.91	0.05	0.38	3.13	14	57	29
MW-11D(2)	19	8.4	2.2	7.4	37.00	0.95	0.69	0.06	0.32	2.02	19	47	34
MW-12D	35	13	3.5	21	72.50	1.75	1.07	0.09	0.91	3.82	26	46	28
MW-13D	22	7.9	2.5	9.5	41.90	1.10	0.65	0.06	0.41	2.23	21	49	29
MW-14D	29	9.3	7.9	13	59.20	1.45	0.77	0.20	0.57	2.98	26	49	26
MW-15D	25	11	2.8	17	55.80	1.25	0.91	0.07	0.74	2.96	27	42	31
MW-18D	24	9.9	3.1	11	48.00	1.20	0.81	0.08	0.48	2.57	22	47	32
MW-14R	7.9	4.7	2.1	5.0	19.70	0.39	0.39	0.05	0.22	1.05	26	37	37
MW-20R	7.8	4.1	2.1	5.4	19.40	0.39	0.34	0.05	0.23	1.02	28	38	33
MW-26R	22	9.9	2.4	6.4	40.70	1.10	0.81	0.06	0.28	2.25	15	49	36

Anions	mg/L					meq/L					% of Total			Total Ions (meq/L)	Cation - Anion Balance	Applicable Ratio (%)	Ratio Exceedance
	Alk	Cl	NO_3	SO_4	Total	Alk	Cl	NO_3	SO_4	Total	Cl	Alk	SO_4				
MW-10S	94	8.3	0.20	10	112.50	1.54	0.23	0.00	0.21	1.99	12	78	10	5.01	20.68	5	Exceeds
MW-11S	100	34	3.9	8	146.30	1.64	0.96	0.06	0.17	2.84	34	58	6	5.59	1.52	5	-
MW-12S	56	11	8	15	90.00	0.92	0.31	0.13	0.31	1.67	19	55	19	4.19	20.27	10	Exceeds
MW-13S	61	15	1.9	9.8	87.70	1.00	0.42	0.03	0.20	1.66	26	60	12	3.42	2.99	10	-
MW-14S	48	20	0.20	3.2	71.40	0.79	0.56	0.00	0.07	1.42	40	55	5	5.12	44.49	5	Exceeds
MW-15S	140	9.2	0.20	3.2	152.60	2.30	0.26	0.00	0.07	2.63	10	87	3	5.13	2.43	5	-
MW-17S	160	12	0.20	10.0	182.20	2.62	0.34	0.00	0.21	3.17	11	83	7	6.42	1.06	5	-
MW-18S	180	14	4.9	14	212.90	2.95	0.39	0.08	0.29	3.72	11	79	8	6.36	16.83	5	Exceeds
MW-29S	120	12	0.20	15	147.20	1.97	0.34	0.00	0.31	2.62	13	75	12	5.26	0.25	5	-
FMMW-1	92	9.2	1.3	14	116.50	1.51	0.26	0.02	0.29	2.08	12	73	14	5.51	24.52	5	Exceeds
FMMW-2	130	21	10	9	169.80	2.13	0.59	0.16	0.18	3.07	19	69	6	5.35	14.80	5	Exceeds
MW-10D	76	5.2	1.8	8.0	91.00	1.25	0.15	0.03	0.17	1.59	9	78	10	4.72	32.73	10	Exceeds
MW-11D(2)	87	5.6	1.9	8.7	103.20	1.43	0.16	0.03	0.18	1.80	9	79	10	3.81	5.80	10	-
MW-12D	140	9.0	0.92	7.7	157.62	2.30	0.25	0.01	0.16	2.72	9	84	6	6.54	16.73	5	Exceeds
MW-13D	110	13	1.4	12	136.40	1.80	0.37	0.02	0.25	2.44	15	74	10	4.67	4.66	10	-
MW-14D	98	12.0	0.20	9.8	120.00	1.61	0.34	0.00	0.20	2.15	16	75	9	5.13	16.12	5	Exceeds
MW-15D	130	9.1	0.20	10	149.30	2.13	0.26	0.00	0.21	2.60	10	82	8	5.56	6.54	5	Exceeds
MW-18D	110	6.9	1.8	8.1	126.80	1.80	0.19	0.03	0.17	2.20	9	82	8	4.77	7.85	10	-
MW-14R	53	1.8	0.20	4.2	59.20	0.87	0.05	0.00	0.09	1.01	5	86	9	2.06	2.02	10	-
MW-20R	46	1.8	0.20	3.6	51.60	0.75	0.05	0.00	0.07	0.88	6	85	8	1.90	6.96	10	-
MW-26R	100	5.3	0.20	11.0	116.50	1.64	0.15	0.00	0.23	2.02	7	81	11	4.27	5.40	10	-

Notes:
mg/L = milligrams per liter
meq/L = milliequivalents per liter
Total alkalinity concentration, reported as calcium carbonate (CaCO3), is converted to the bicarbonate (HCO3-) ion by multiplying by a factor of 1.2.
Cation / anion balance equation is the equivalent percent difference in cations minus anions divided by the sum of cations and anions [(cations-anions)/(anions+cations)*100].
The MRL was used for analytes that were non-detect
A 10% difference threshold is used if the total cation-anion sums are < 5.0 meq/liter.
A 5% difference threshold is used if the total cation-anion sums are > or = to 5.0 meq/liter.
— = Not Applicable

Table 10. Leachate Monitoring Results
May 2023
Hidden Valley Landfill, Pierce County, Washington

Parameters	MRL	Leachate-East Area	Leachate-Side Slope	Leak Detection-Side Slope	Hydraulic Gradient Control System
Volatile Organics (µg/L)					
1,4-Dichlorobenzene	0.5-0.8	1.8	*	*	*
2-Butanone (MEK)	6.0	*	*	*	*
Acetone	10.0	11	*	*	*
Benzene	0.5-0.8	0.67	3.3	1.7	*
Carbon disulfide	0.5-0.84	0.95	2.4	*	*
cis-1,2-Dichloroethene	0.5-0.75	*	*	8.7	*
Ethylbenzene	1.0	*	1.7	*	*
m-Xylene & p-Xylene	0.5-0.77	2.9	2.0	1.30	*
o-Xylene	0.5-0.95	1	0.72	*	*
Toluene	0.5-0.85	0.88	3.1	1.30	*
Total Metals (mg/L)					
Calcium	0.2-0.78	76	11	31	110
Iron	0.01-0.02	2.00	0.87	2.80	0.51
Magnesium	0.1-0.26	49	20	26	29
Manganese	0.005	1.4	0.076	0.25	3.5
Potassium	2-2.4	230	510	490	3.6
Sodium	1-3.7	2,200	6,700	5,100	19
Inorganic Parameters (mg/L)					
Alkalinity	10	3,200	7,400	6,200	410
Ammonia	0.1-2.2	270	530	410	*
Chloride	0.2-60	2,500	8,900	6,800	2.5
Nitrate as N	0.5-0.9	* H	*	*	*
Sulfate	0.2-5.0	67	440	150	13
Total Dissolved Solids	10-470	4,600	17,000	14,000	390
Total Organic Carbon - Quad	1-35	390	880	710	2.2
Total Suspended Solids	4.0	*	10.0	4.4	4.4
Field Parameters					
Dissolved Oxygen (mg/L)	—	5.25	0.49	2.93	8.01
Oxidation Reduction Potential (mV)	—	-83.3	269.2	-202.6	274.8
pH (SU)	—	7.17	8.04	7.59	6.59
Specific Conductivity (µS/cm)	—	12,261	35,383	27,080	706
Temperature (°C)	—	18.9	28.5	27.6	20.1
Turbidity (NTU)	—	126.7	21.1	56.5	12.6

Notes:

Analyses performed by Eurofins TestAmerica in Denver, Colorado.

Volatile organic compounds not listed were not present at concentrations exceeding the MRL

°C = degrees celcius

H = Sample was prepped or analyzed beyond specified holding time

mg/L = milligrams per liter

mV = millivolts

NTU = Nephelometric Turbidity Units

SU = standard units

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

— = not applicable or not analyzed

* = not reported at or above the MRL (Method Reporting Limit)

Appendix E

TIME SERIES PLOTS

Figure 1

Specific Conductivity

Shallow Perched Aquifer, Hidden Valley Landfill
Wells MW-11S, MW-12S, MW-13S, MW-14S, and MW-17S

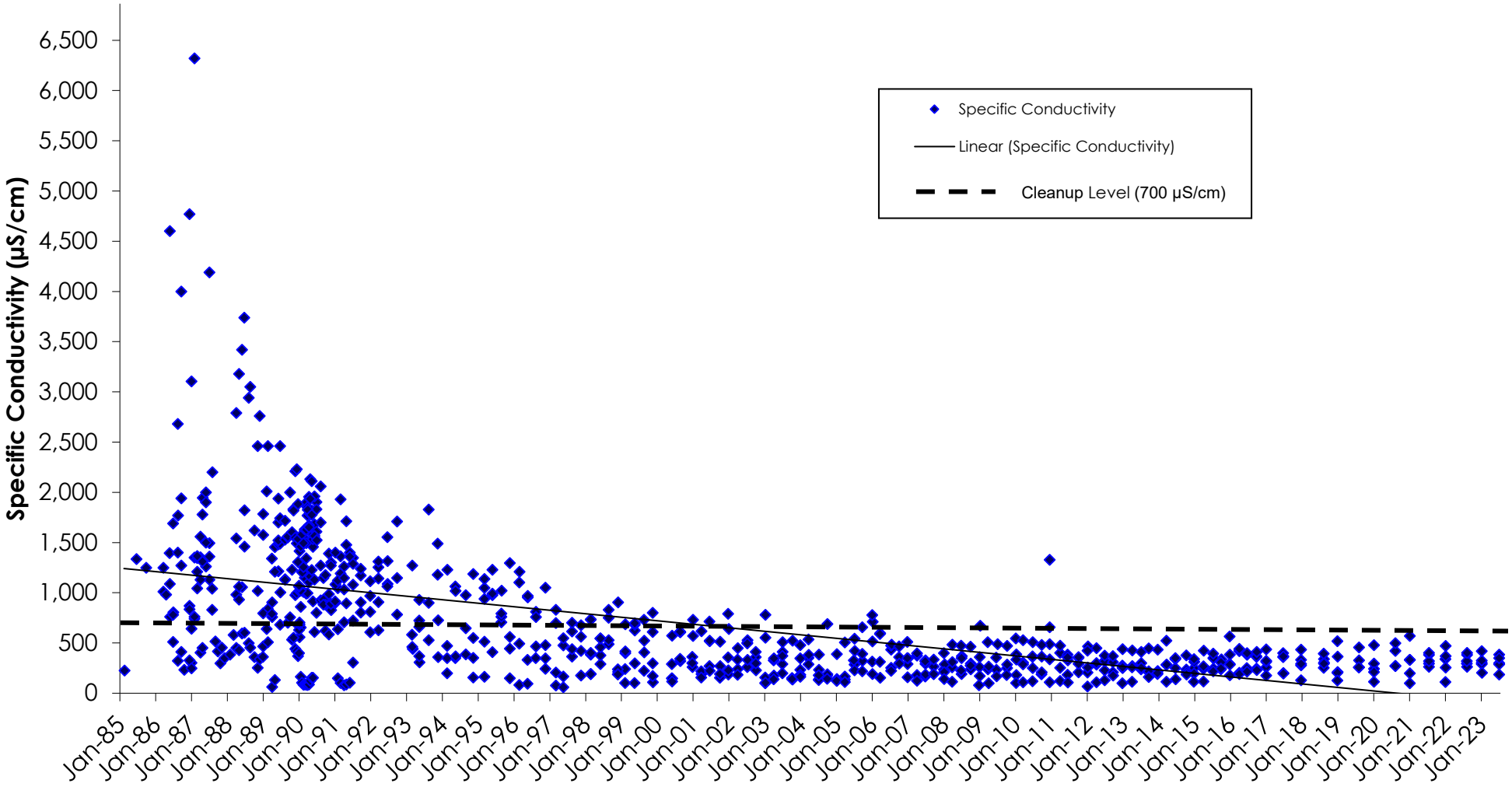


Figure 2

Ammonia

Shallow Perched Aquifer, Hidden Valley Landfill
Wells MW-11S, MW-12S, MW-13S, MW-14S, and MW-17S

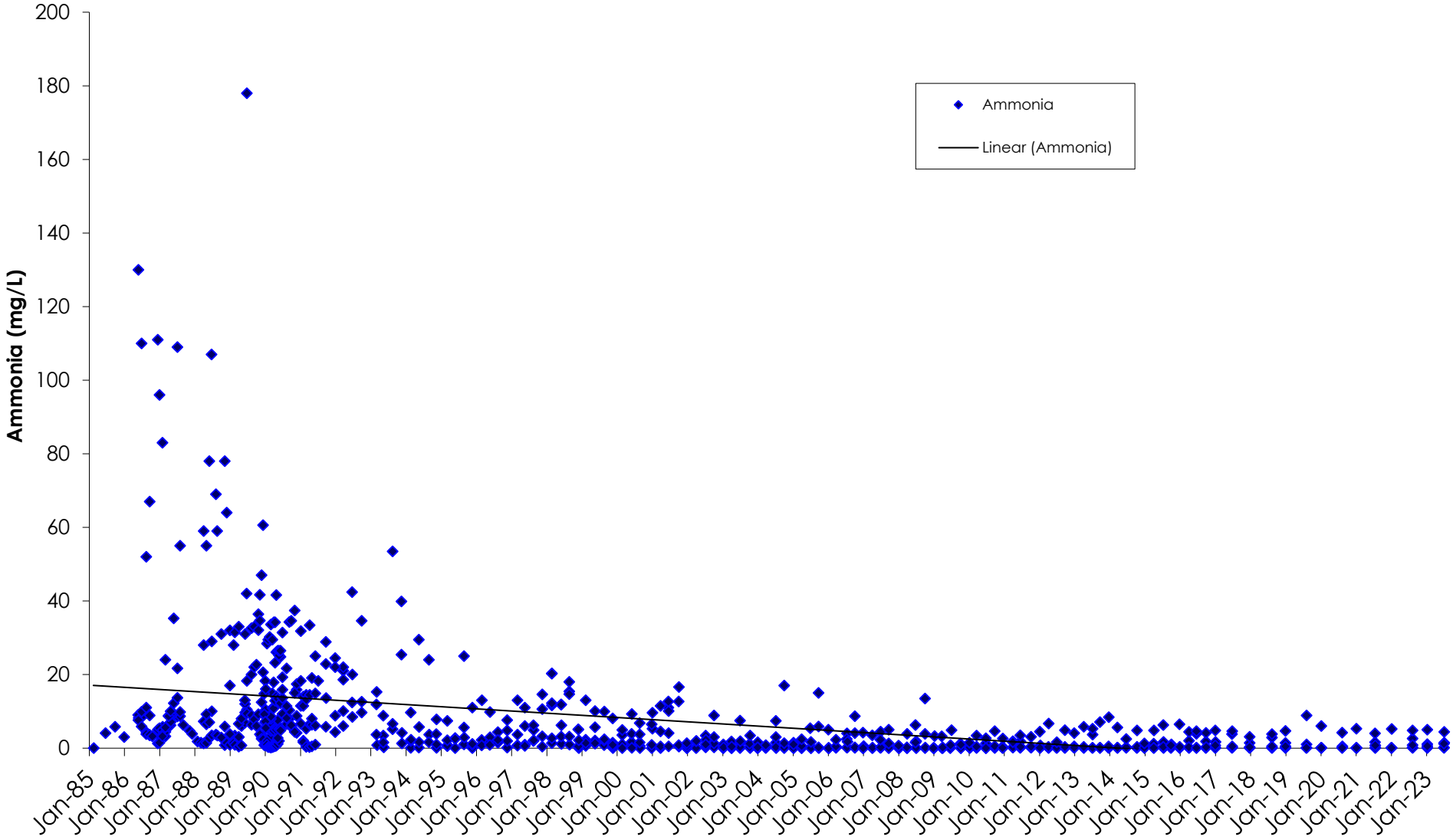


Figure 3

Nitrate

Shallow Perched Aquifer, Hidden Valley Landfill
Wells MW-11S, MW-12S, MW-13S, MW-14S, and MW-17S

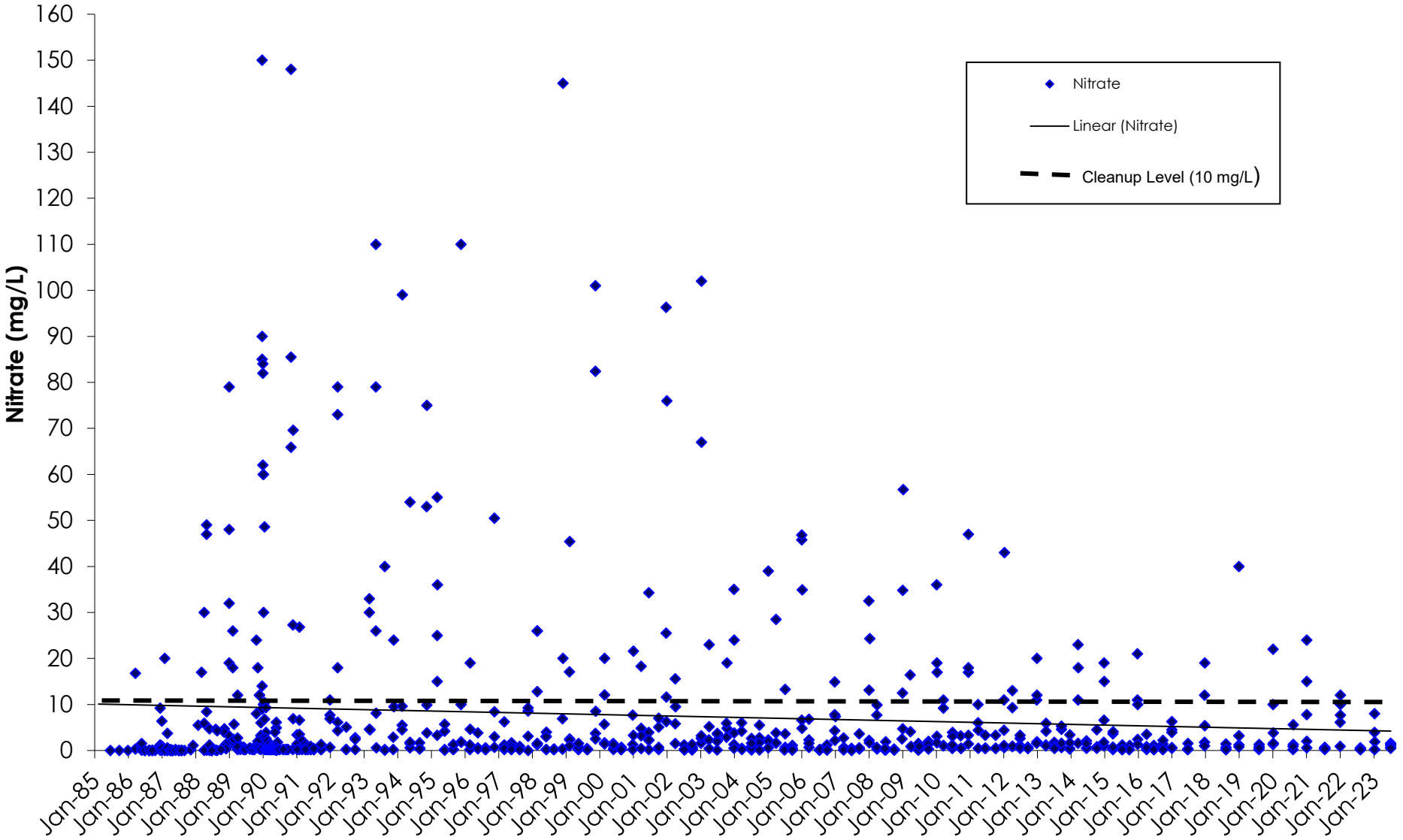


Figure 4

Dissolved Iron

Shallow Perched Aquifer, Hidden Valley Landfill
Wells MW-11S, MW-12S, MW-13S, MW-14S, and MW-17S

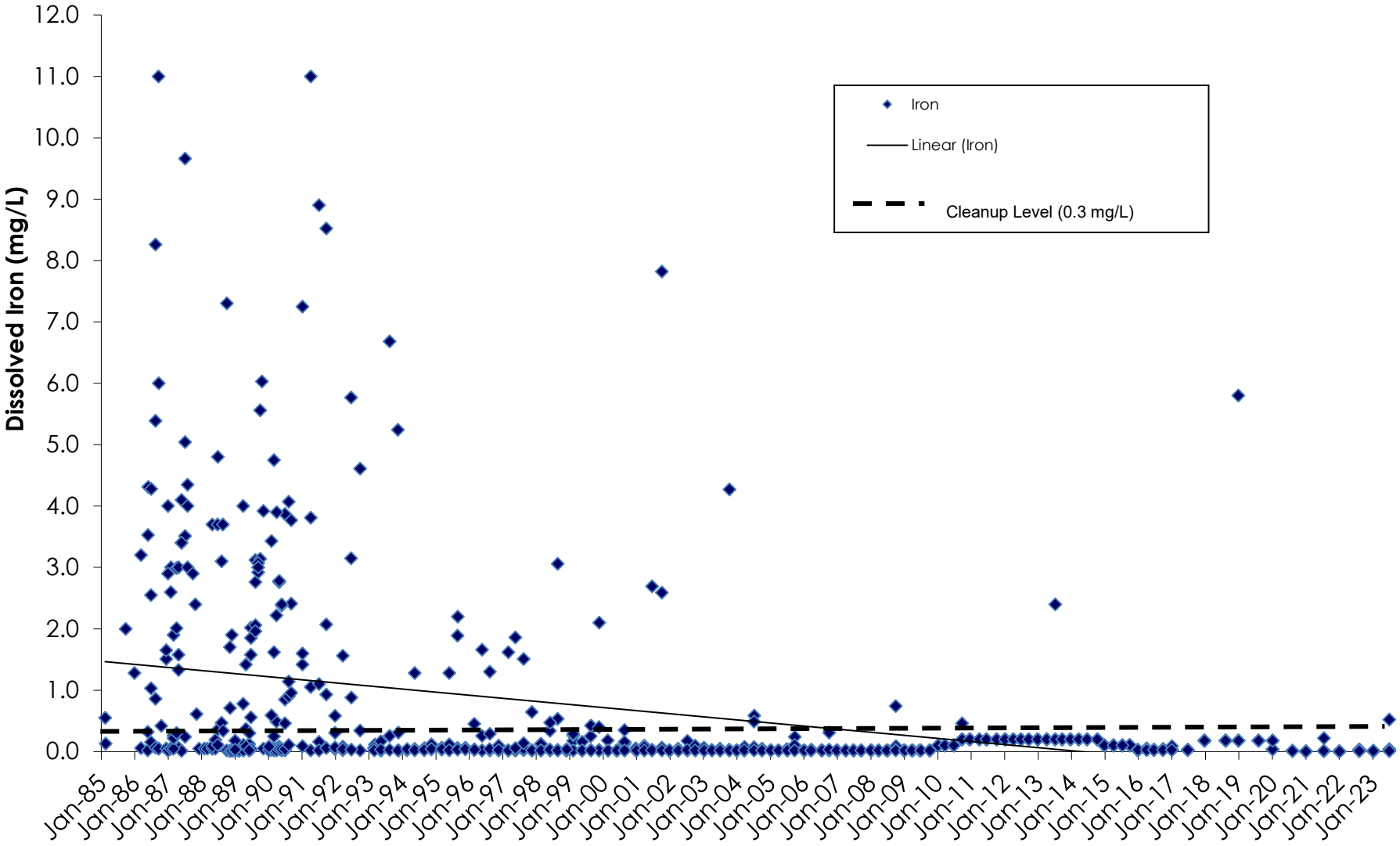


Figure 5

Dissolved Manganese

Shallow Perched Aquifer, Hidden Valley Landfill
Wells MW-11S, MW-12S, MW-13S, MW-14S, and MW-17S

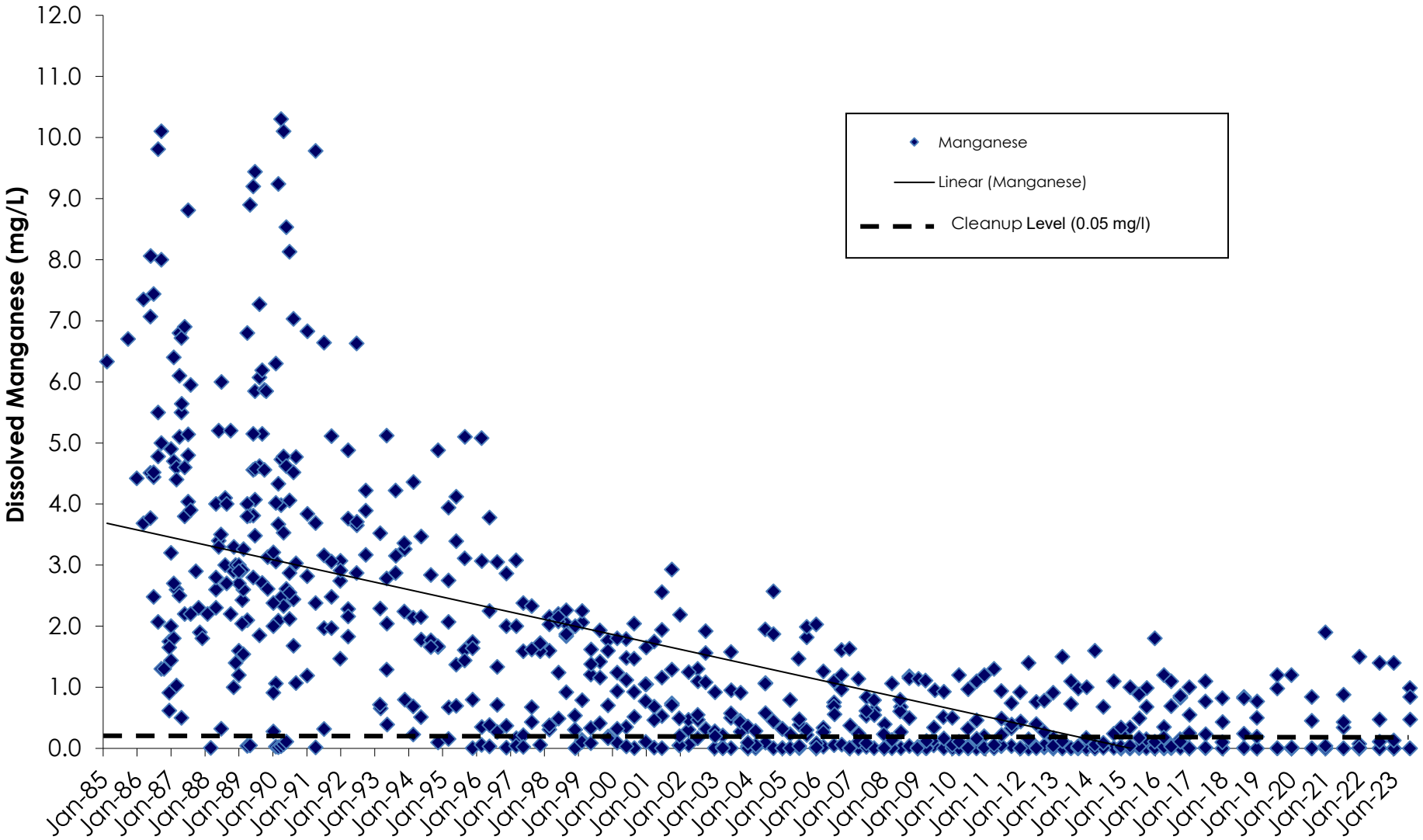


Figure 6

Specific Conductivity

Upper Regional Aquifer, Hidden Valley Landfill
Wells MW-11D(2), MW-12D, MW-13D, and MW-14D

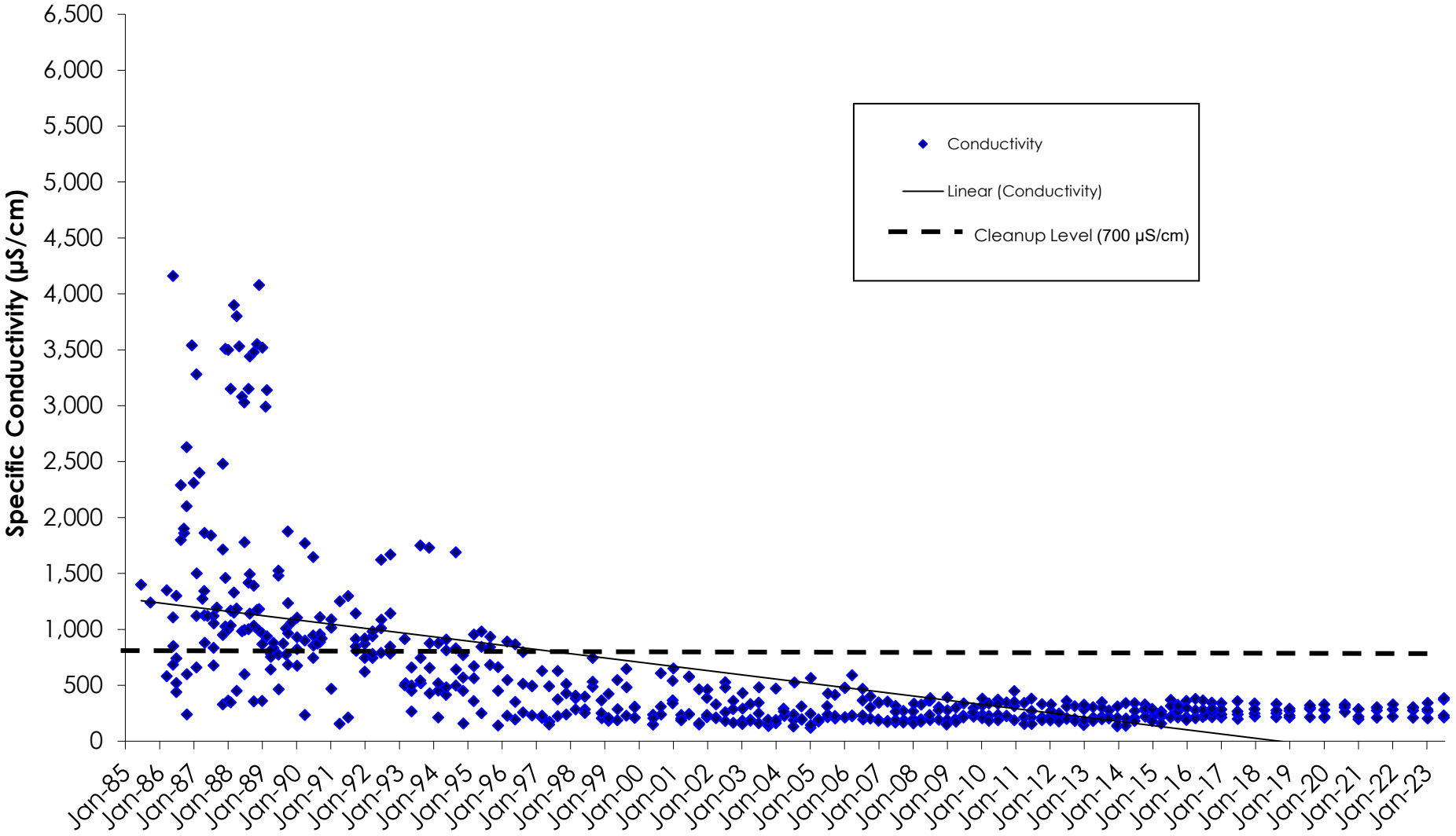


Figure 7

Ammonia

Upper Regional Aquifer, Hidden Valley Landfill
Wells MW-11D(2), MW-12D, MW-13D, and MW-14D

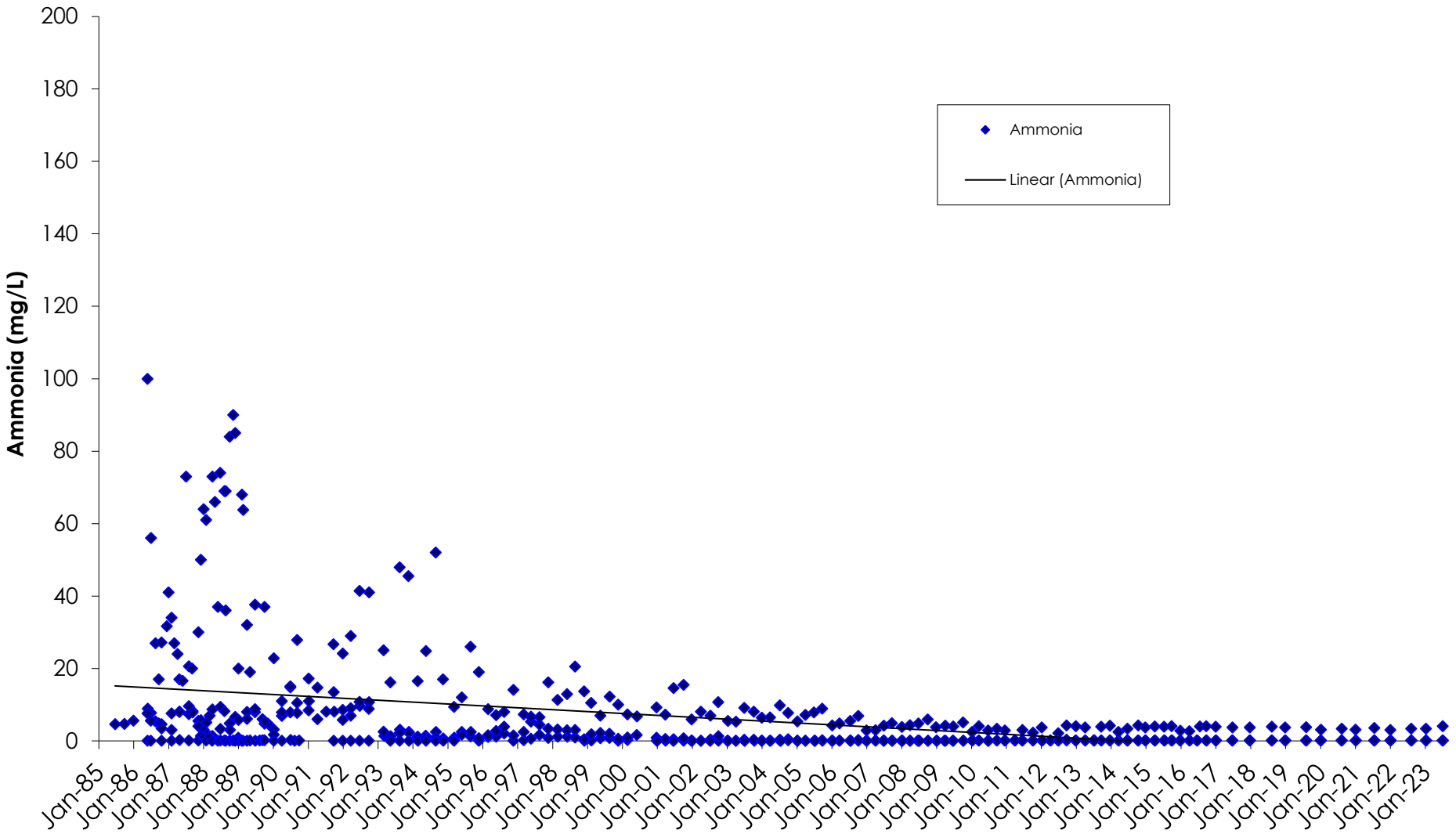


Figure 8

Nitrate

Upper Regional Aquifer, Hidden Valley Landfill
Wells MW-11D(2), MW-12D, MW-13D, and MW-14D

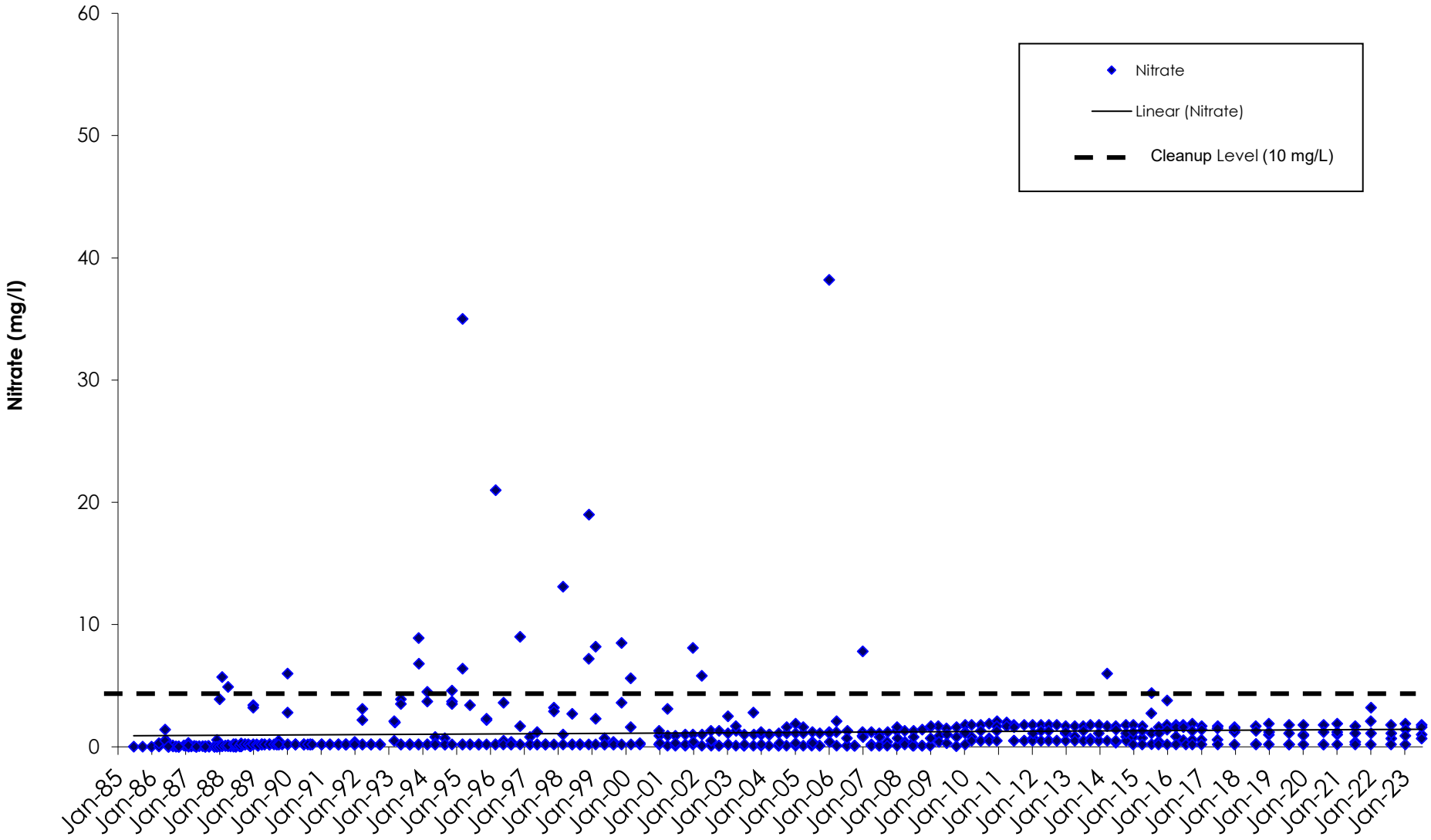


Figure 9

Dissolved Iron

Upper Regional Aquifer, Hidden Valley Landfill
Wells MW-11D(2), MW-12D, MW-13D, and MW-14D

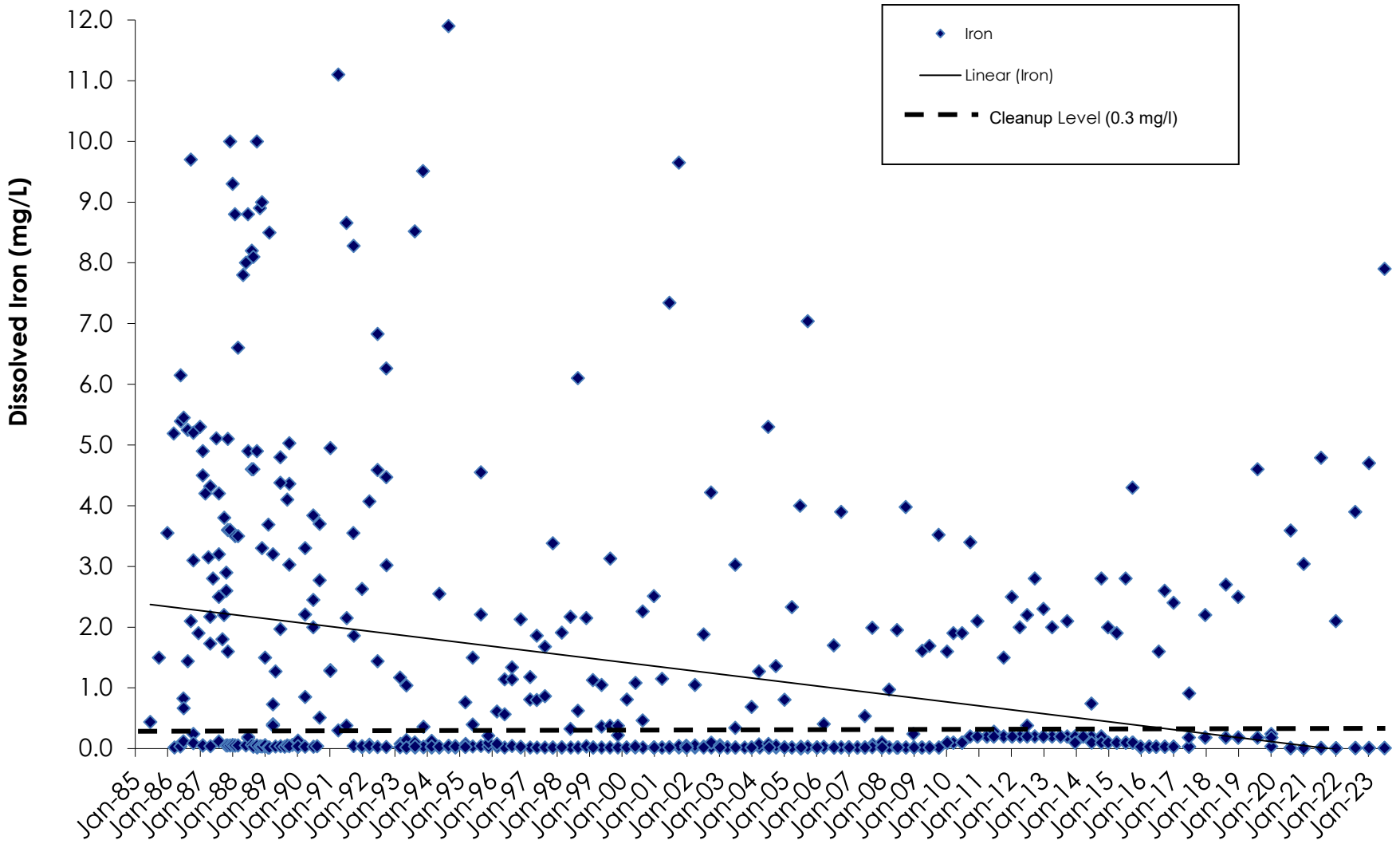


Figure 10

Dissolved Manganese

Upper Regional Aquifer, Hidden Valley Landfill

Wells MW-11D(2), MW-12D, MW-13D, and MW-14D

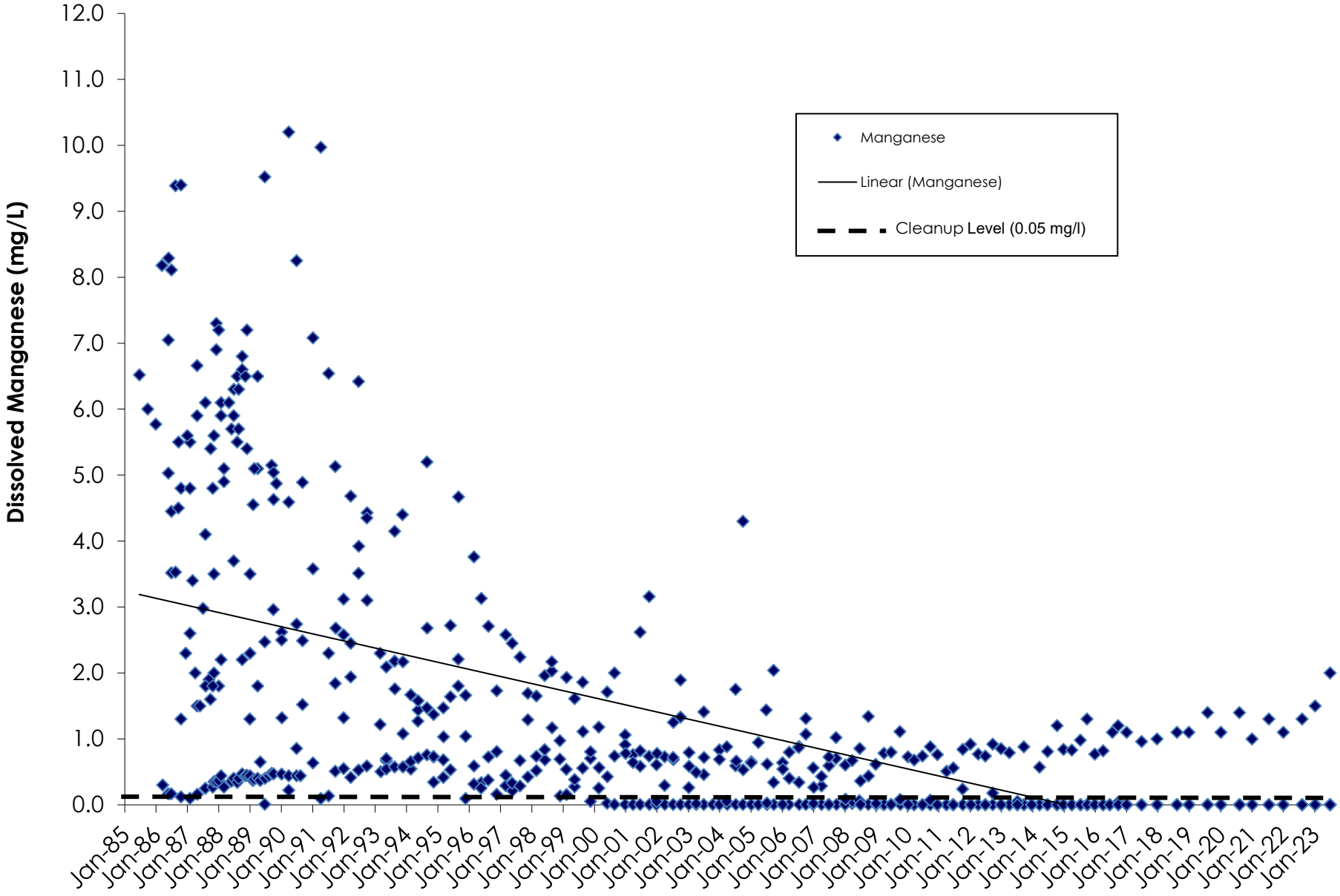


Figure 11

Nitrate

Shallow Perched Aquifer, Hidden Valley Landfill
Well MW-12S, 10 year Trend

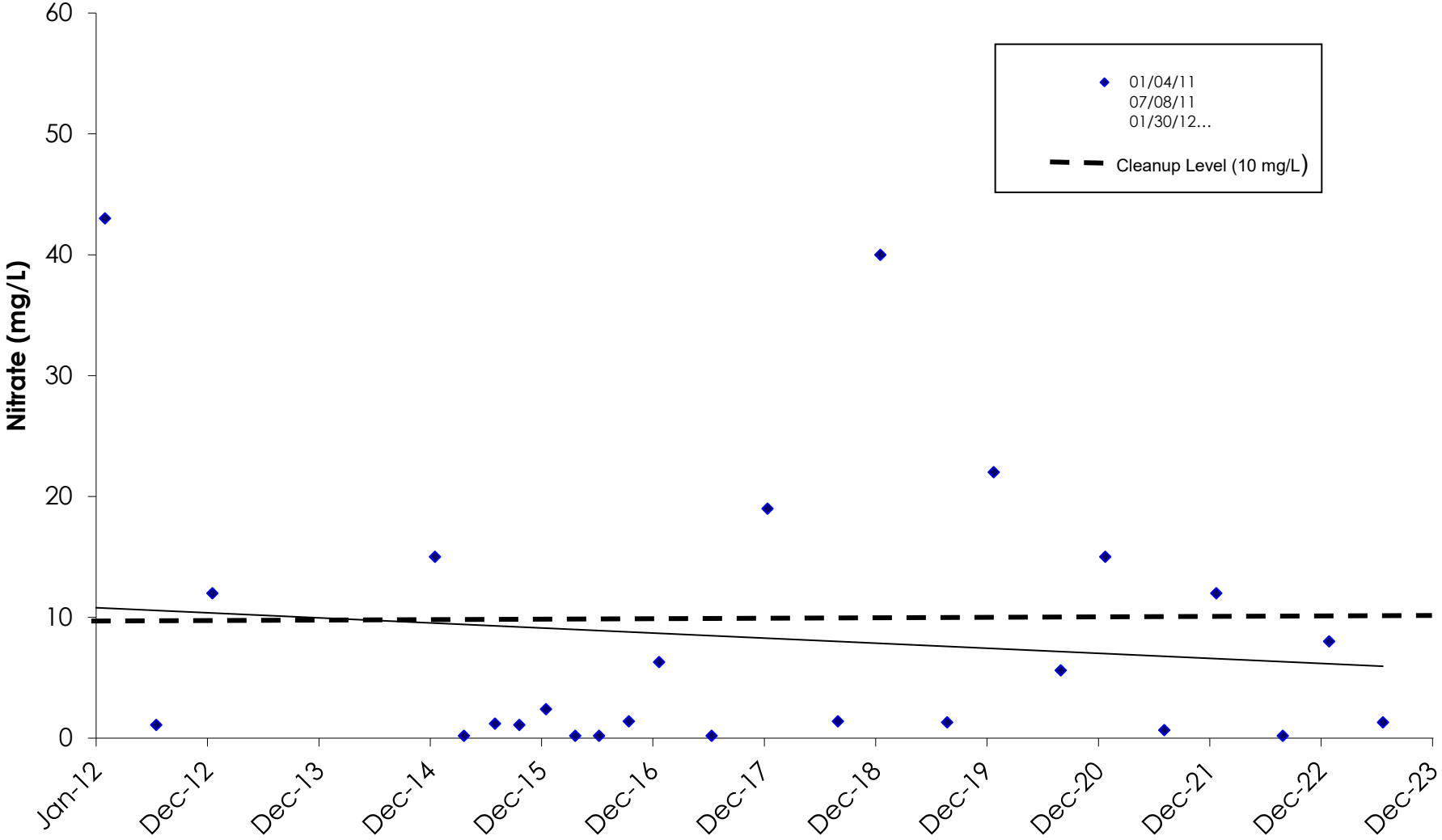


Figure 12

Dissolved Iron

Shallow Perched Aquifer, Hidden Valley Landfill
Well MW-13S, 10 year Trend

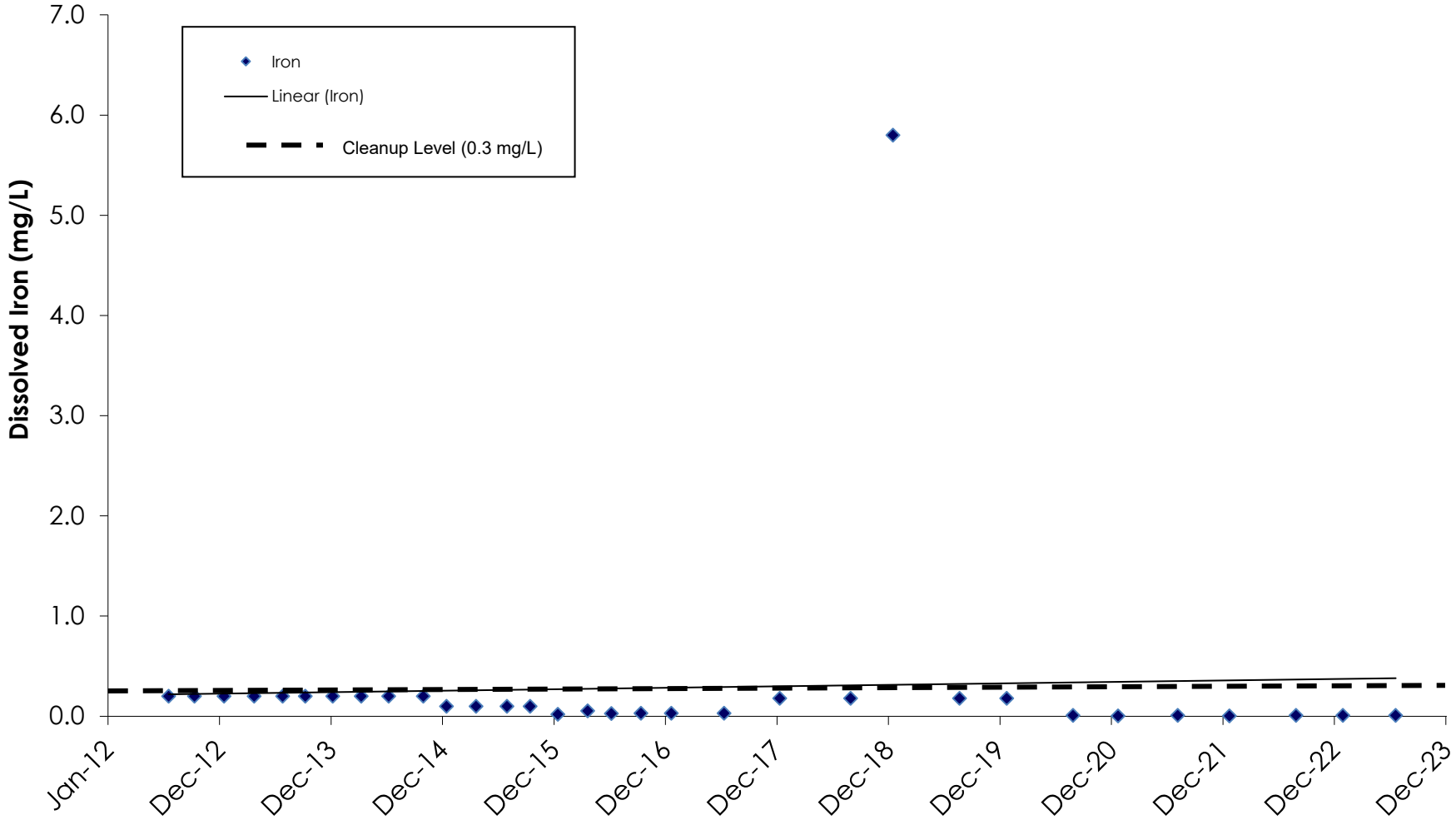


Figure 13

Dissolved Iron

Shallow Perched Aquifer, Hidden Valley Landfill

Well MW-14S, 10 year trend

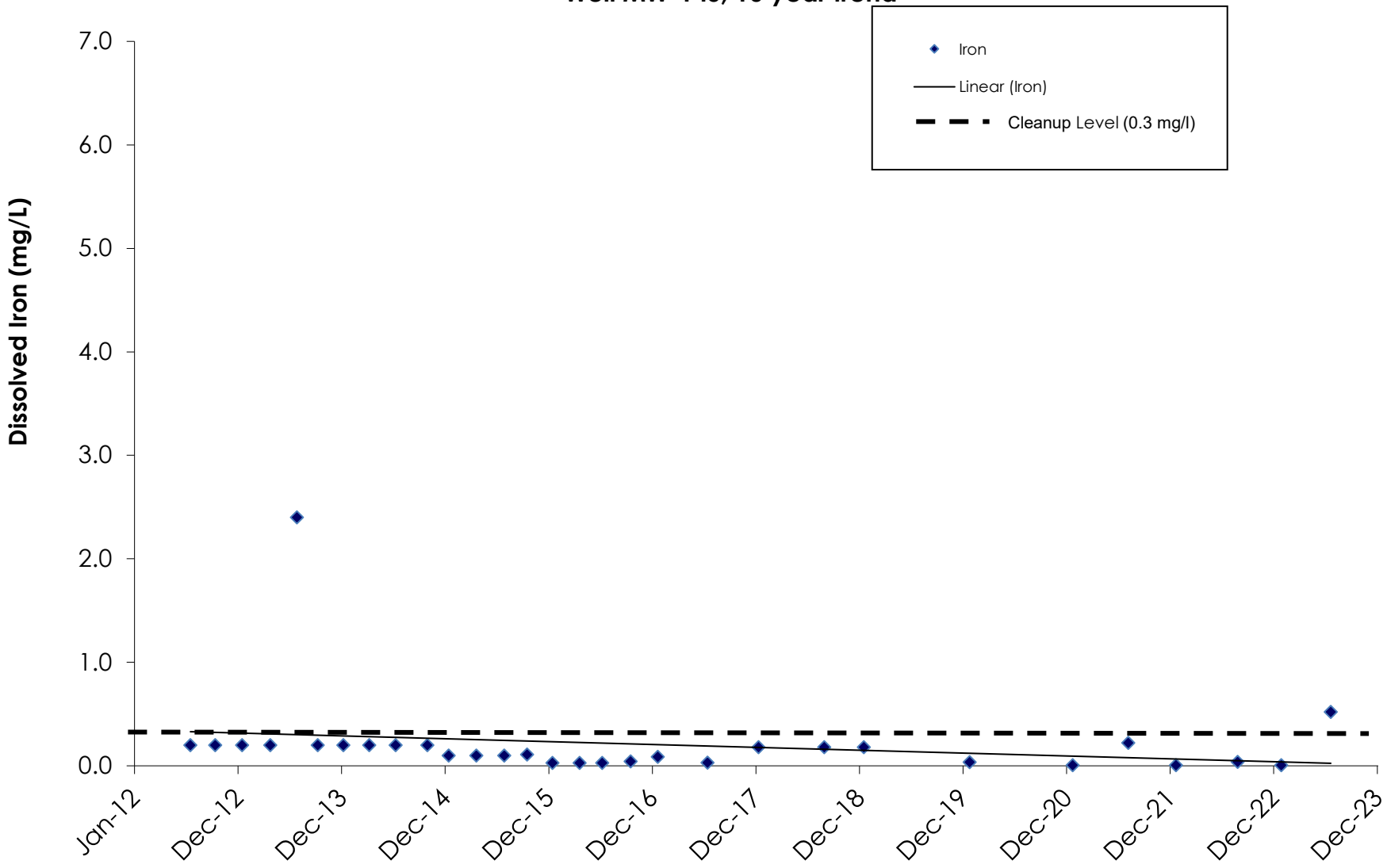


Figure 14

Dissolved Manganese

Shallow Perched Aquifer, Hidden Valley Landfill

Well MW-11S, 10 Year Trend

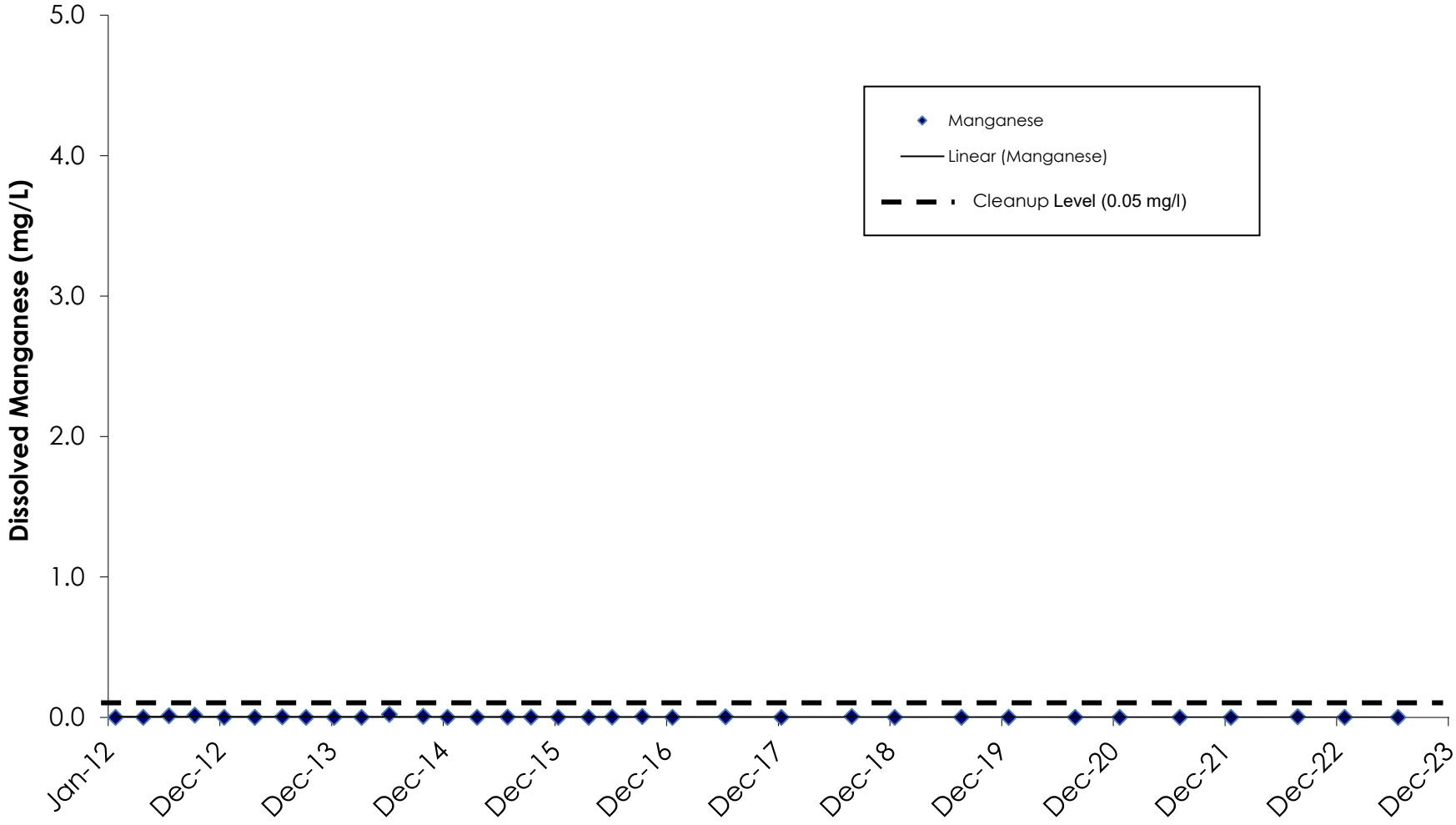


Figure 15

Dissolved Manganese

Shallow Perched Aquifer, Hidden Valley Landfill

Well MW-12S, 10 year trend

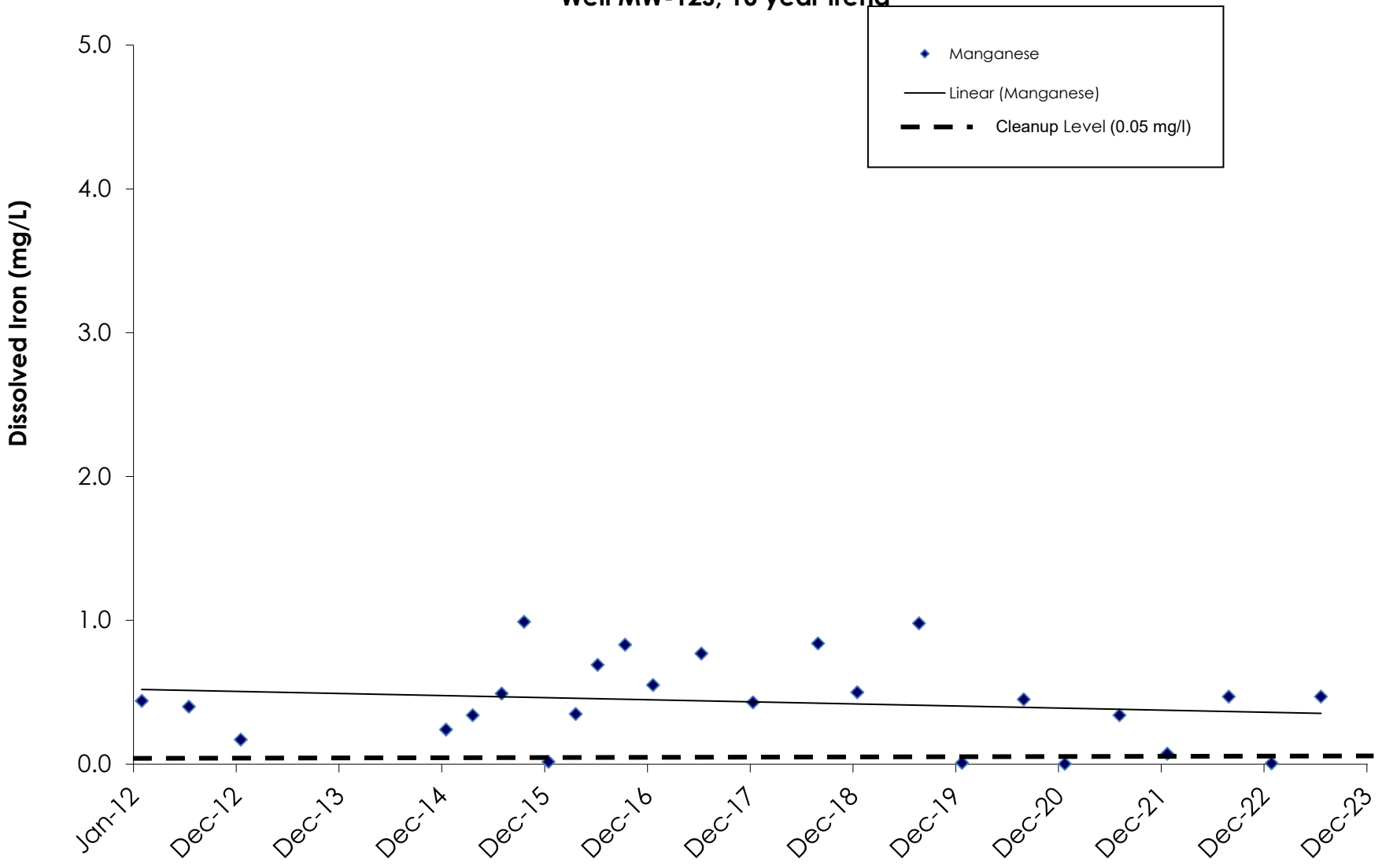


Figure 16

Dissolved Manganese

Shallow Perched Aquifer, Hidden Valley Landfill

Well MW-13S, 10 year trend

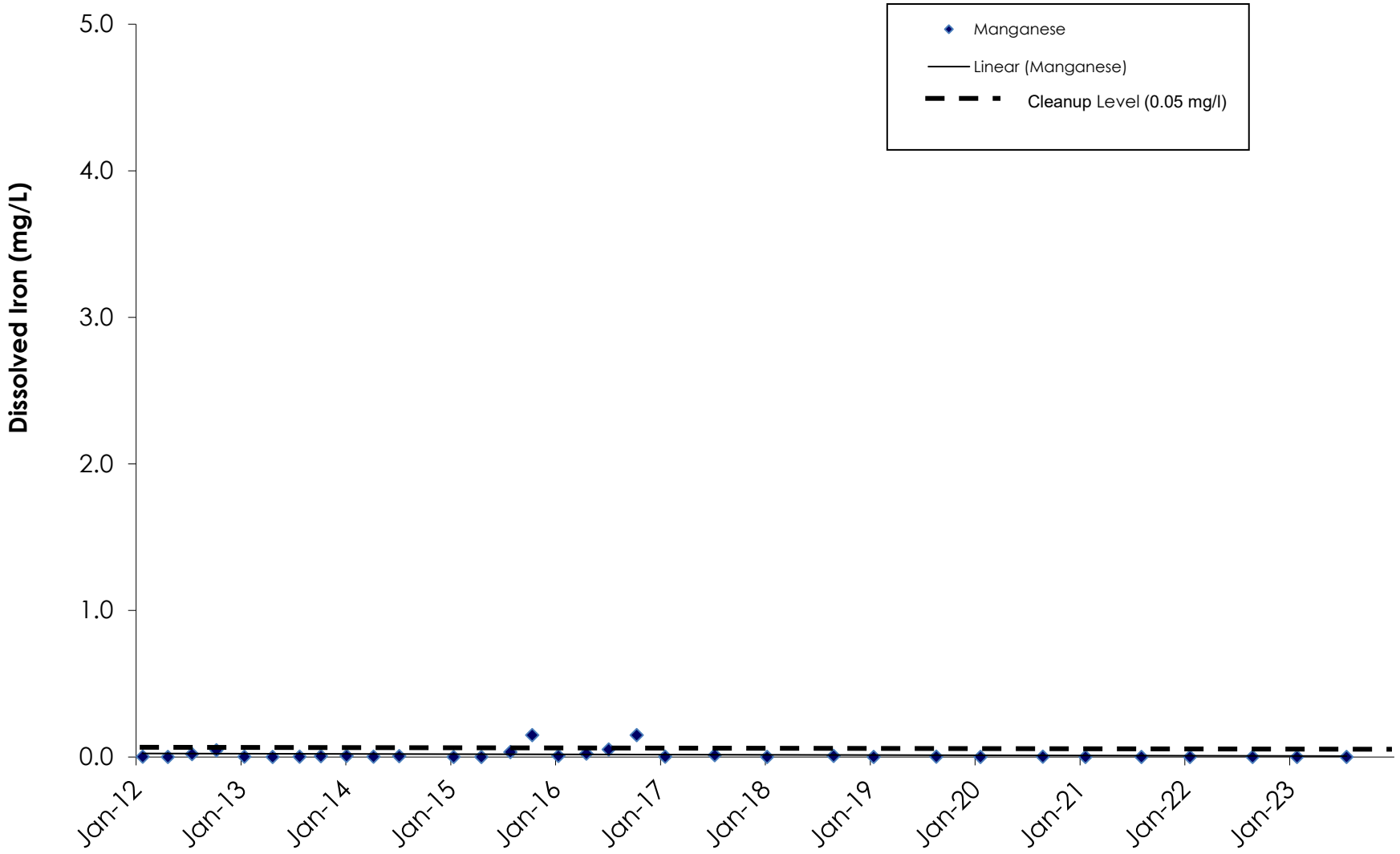


Figure 17

Dissolved Manganese

Shallow Perched Aquifer, Hidden Valley Landfill

Well MW-14S, 10 year trend

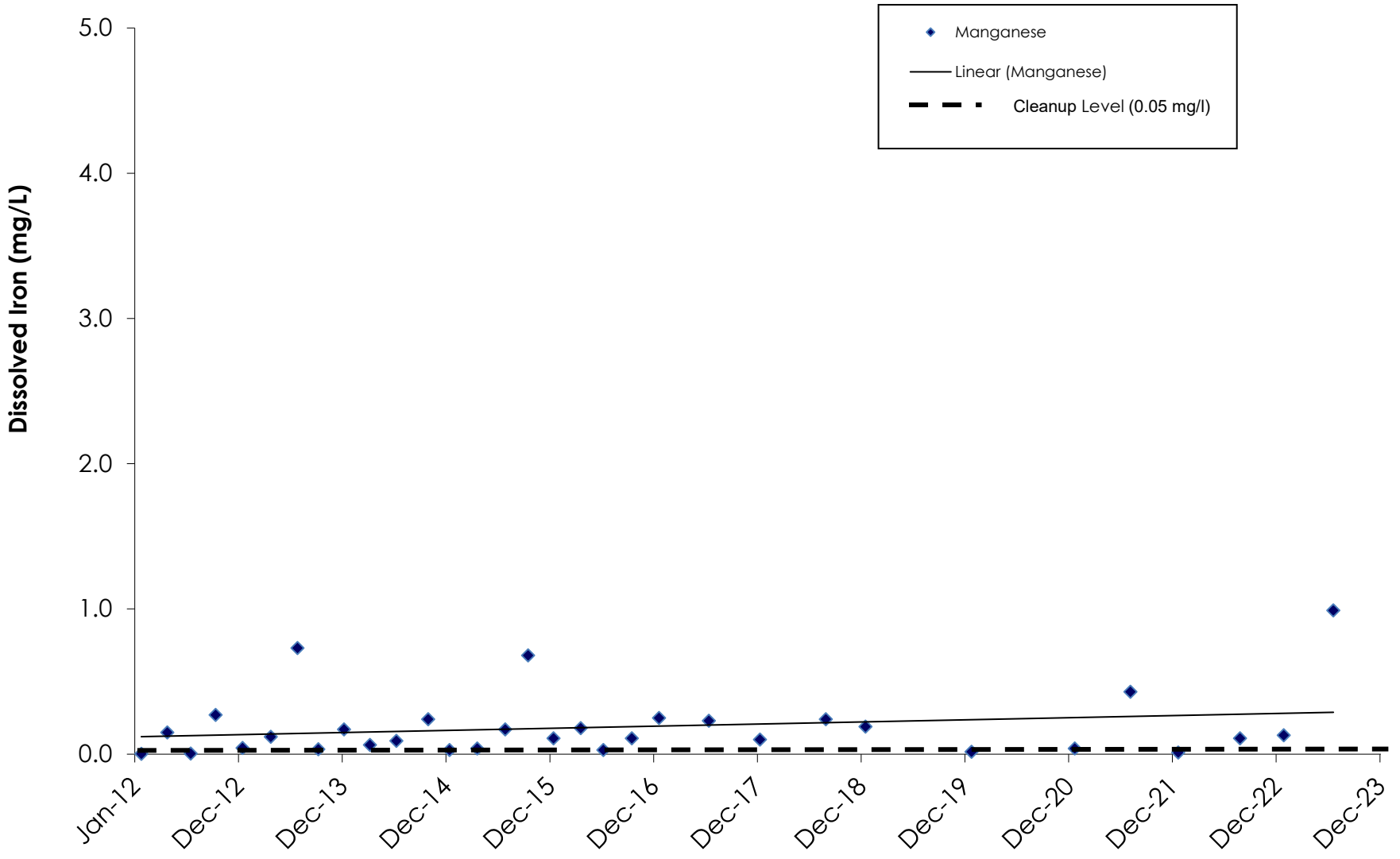


Figure 18

Dissolved Manganese

Shallow Perched Aquifer, Hidden Valley Landfill

Well MW-17S, 10 year trend

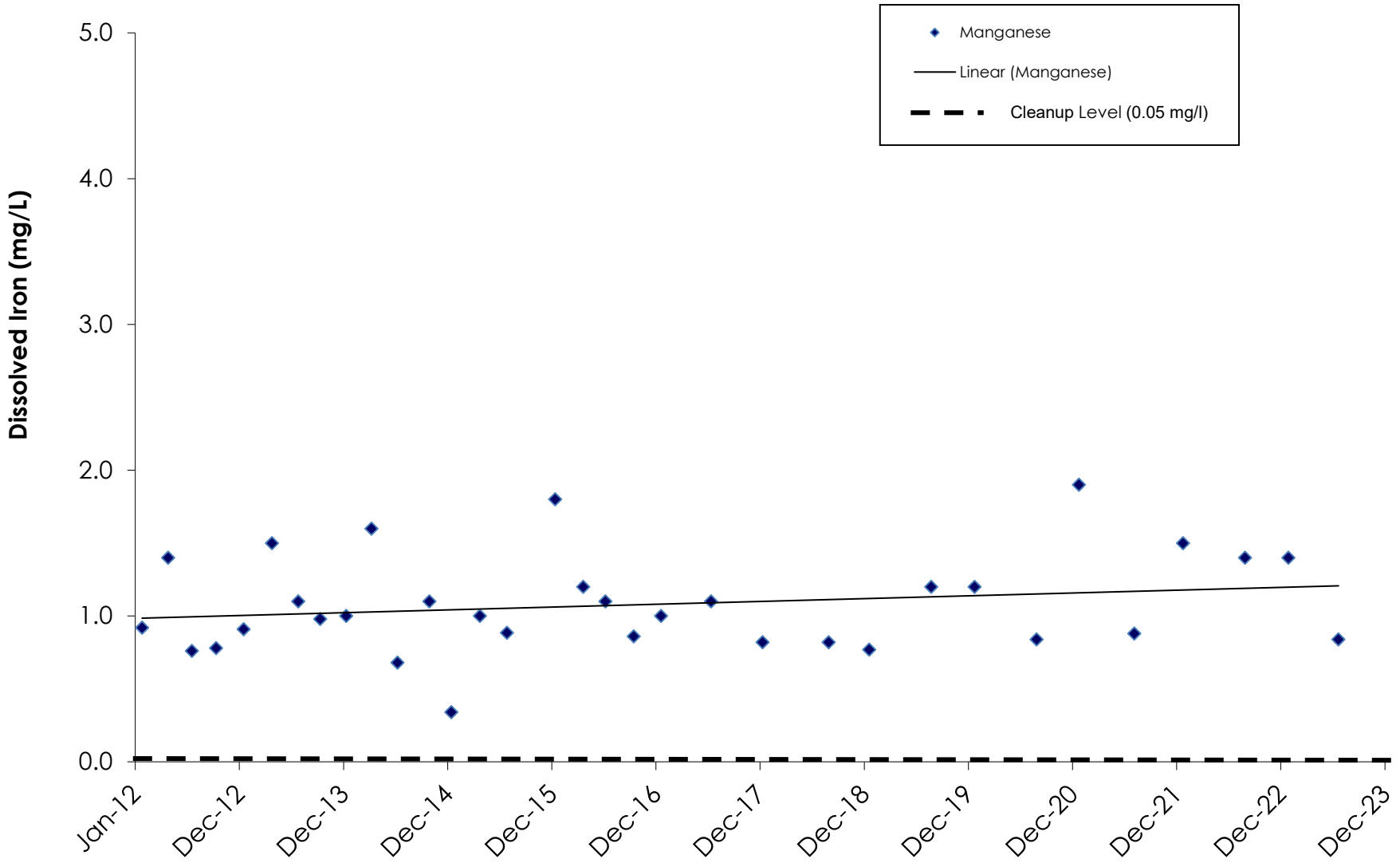


Figure 19

Dissolved Iron

Upper Regional Aquifer, Hidden Valley Landfill

Well MW-11D(2), 10 year trend

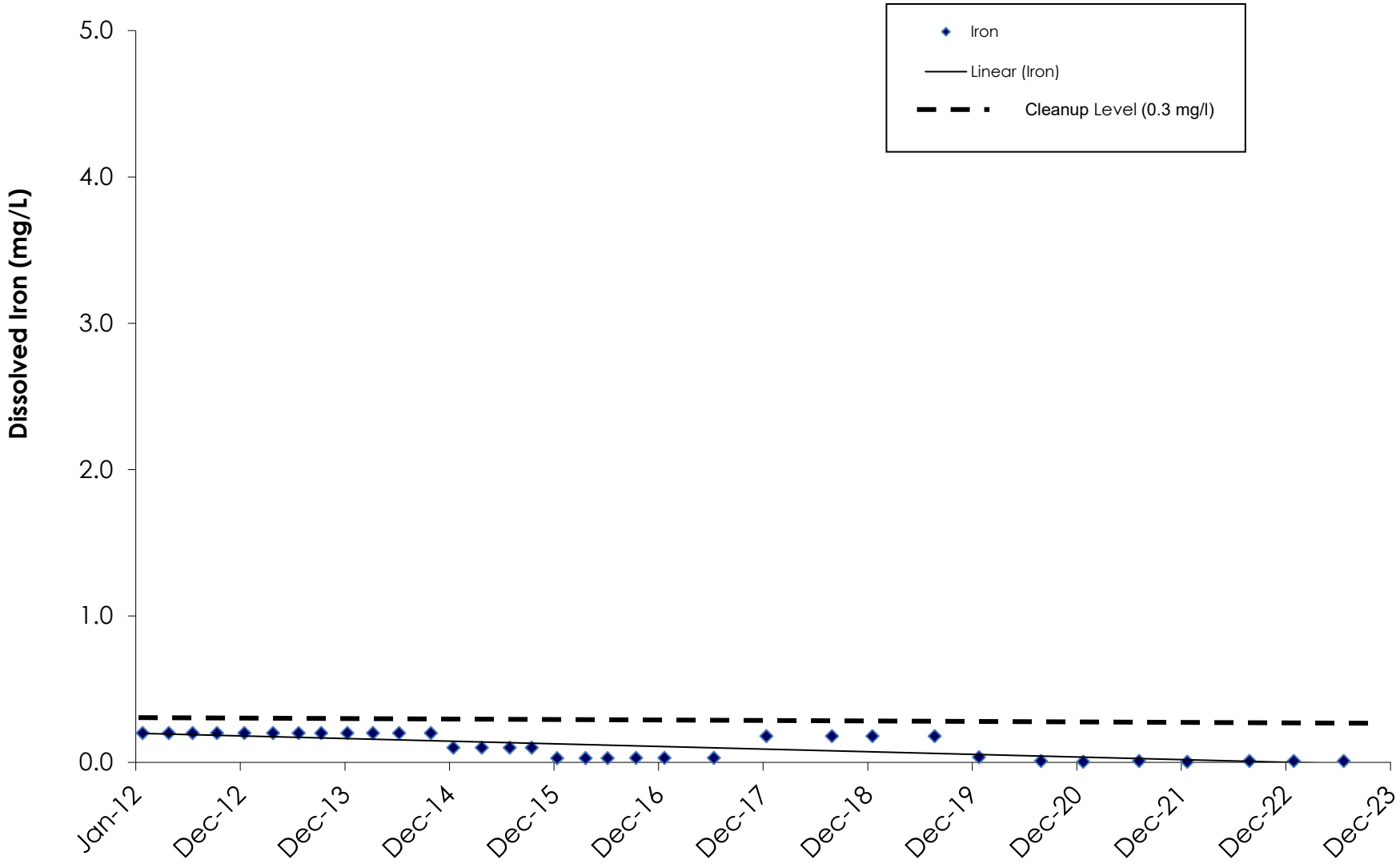


Figure 20

Dissolved Iron

Upper Regional Aquifer, Hidden Valley Landfill

Well MW-12D, 10 year trend

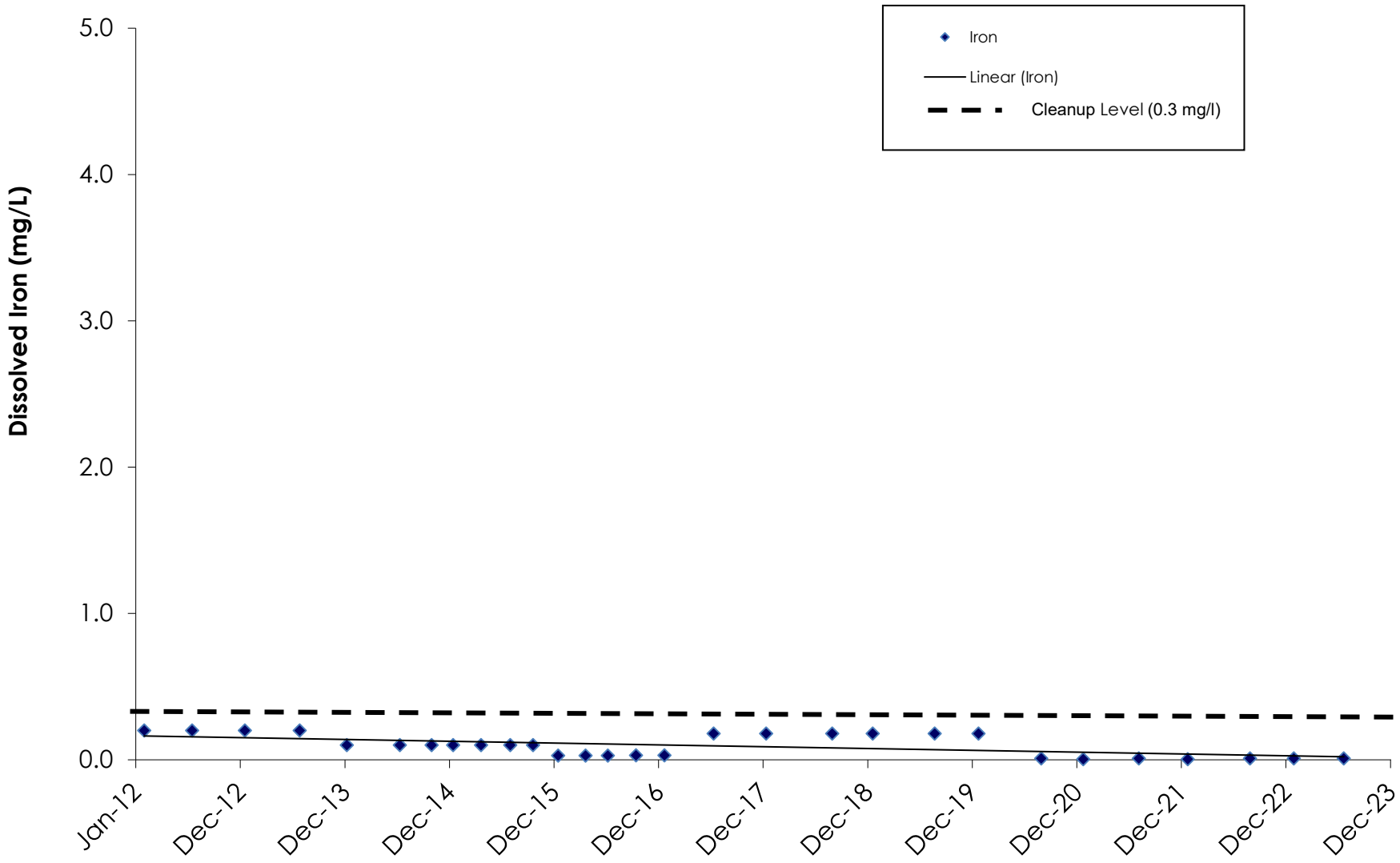


Figure 21

Dissolved Iron

Upper Regional Aquifer, Hidden Valley Landfill

Well MW-13D, 10 year trend

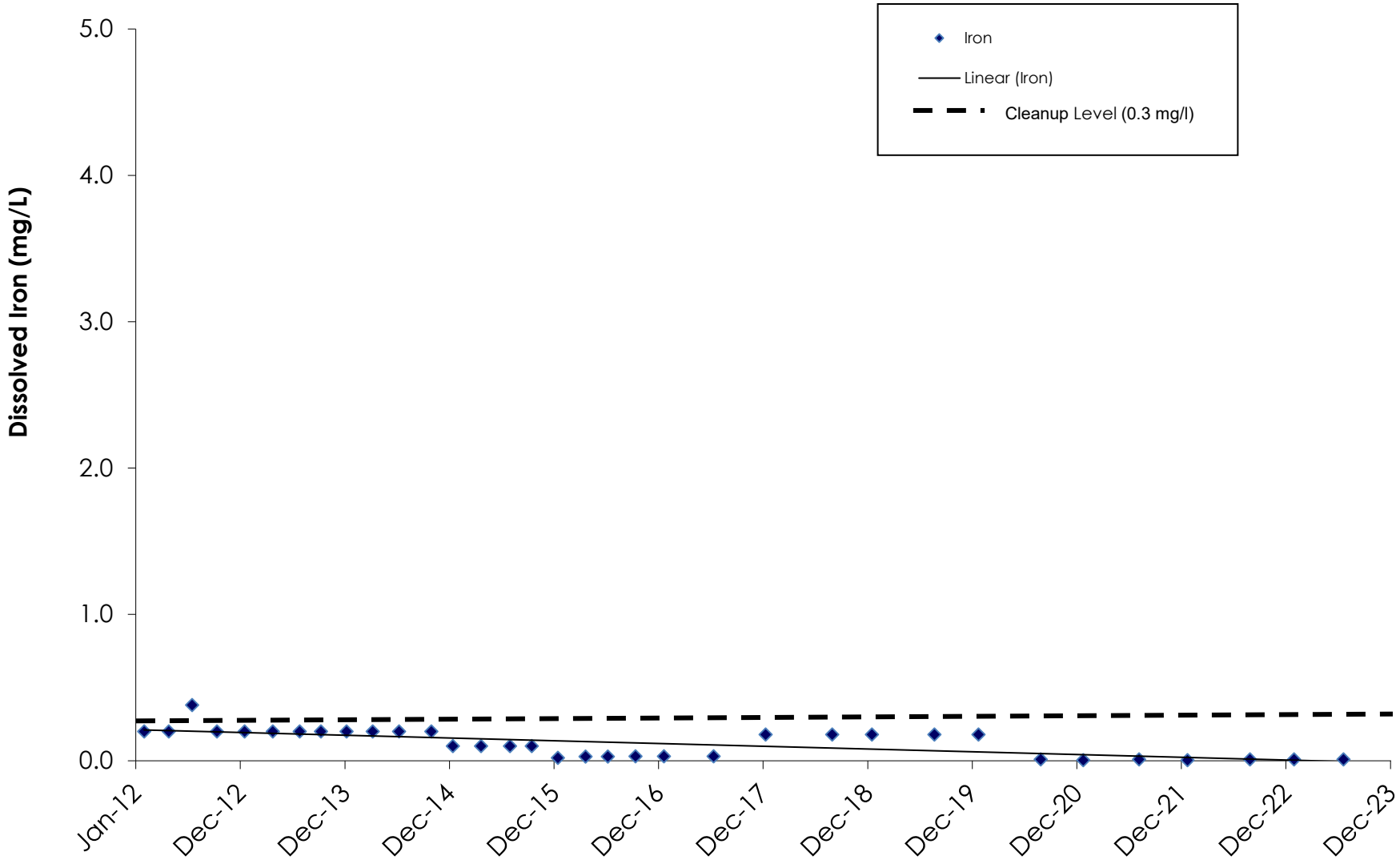


Figure 22

Dissolved Iron

Upper Regional Aquifer, Hidden Valley Landfill

Well MW-14D, 10 year trend

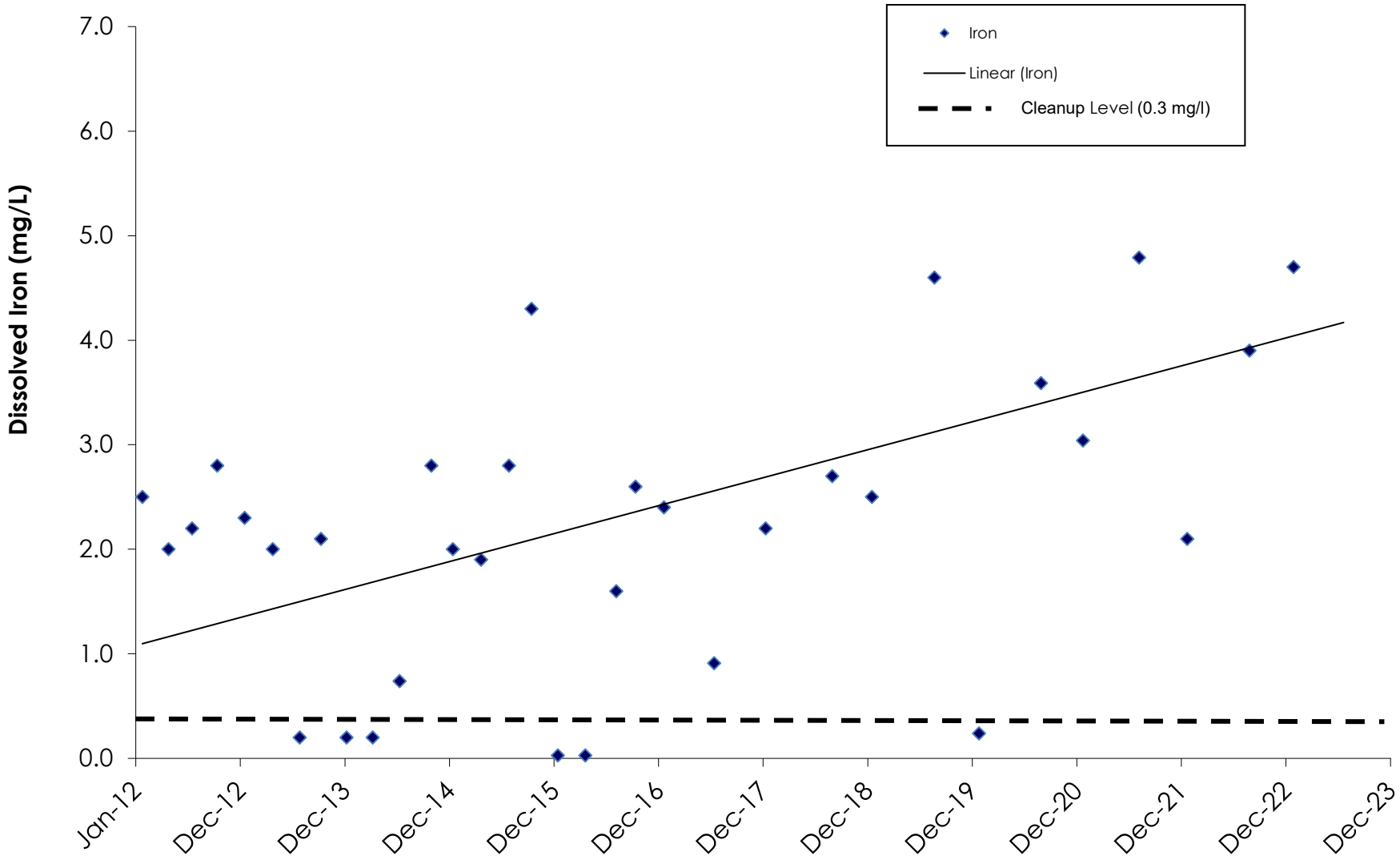


Figure 23

Dissolved Manganese

Upper Regional Aquifer, Hidden Valley Landfill

Well MW-11D(2), 10 year trend

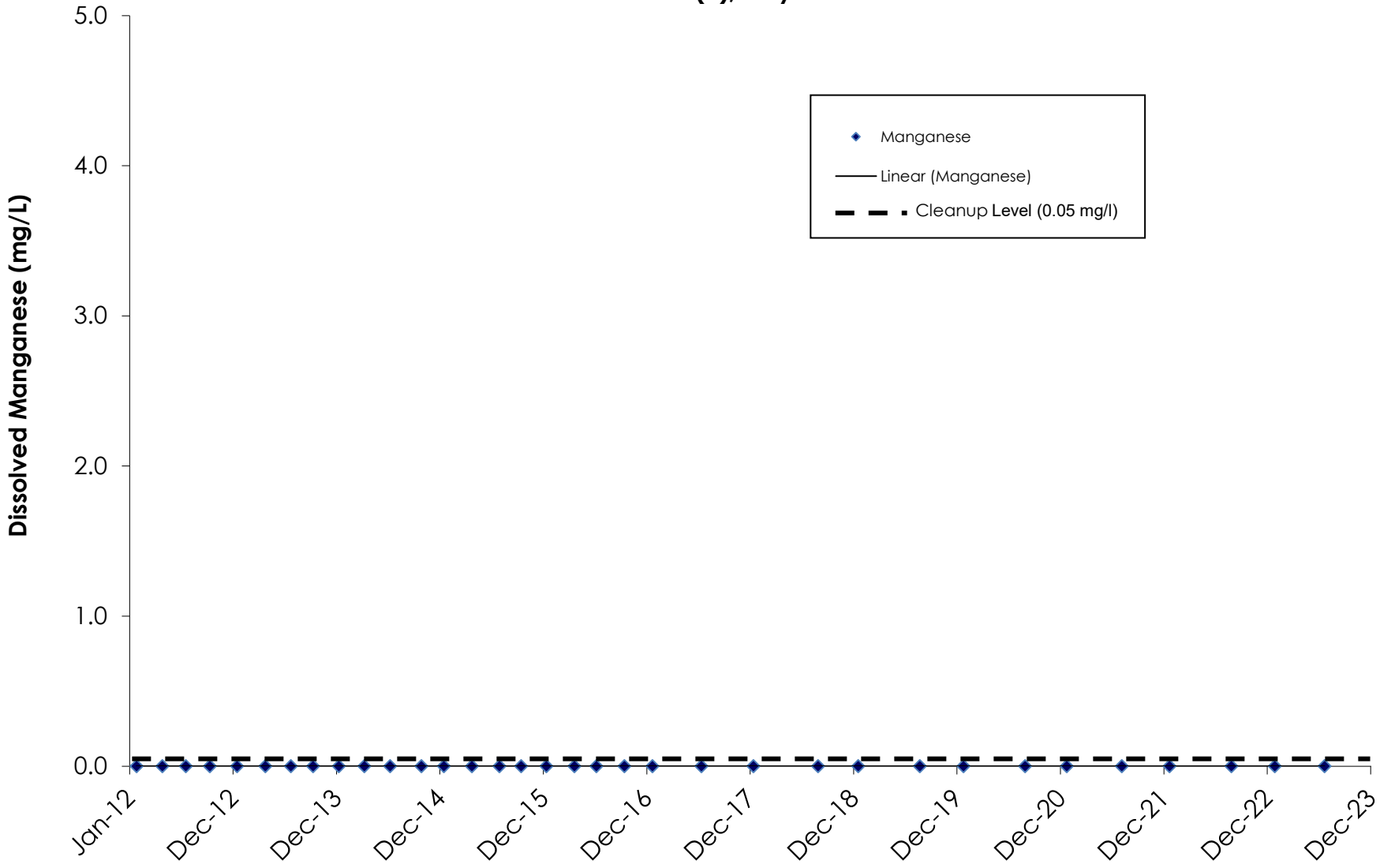


Figure 24

Dissolved Manganese

Upper Regional Aquifer, Hidden Valley Landfill

Well MW-12D, 10 year trend

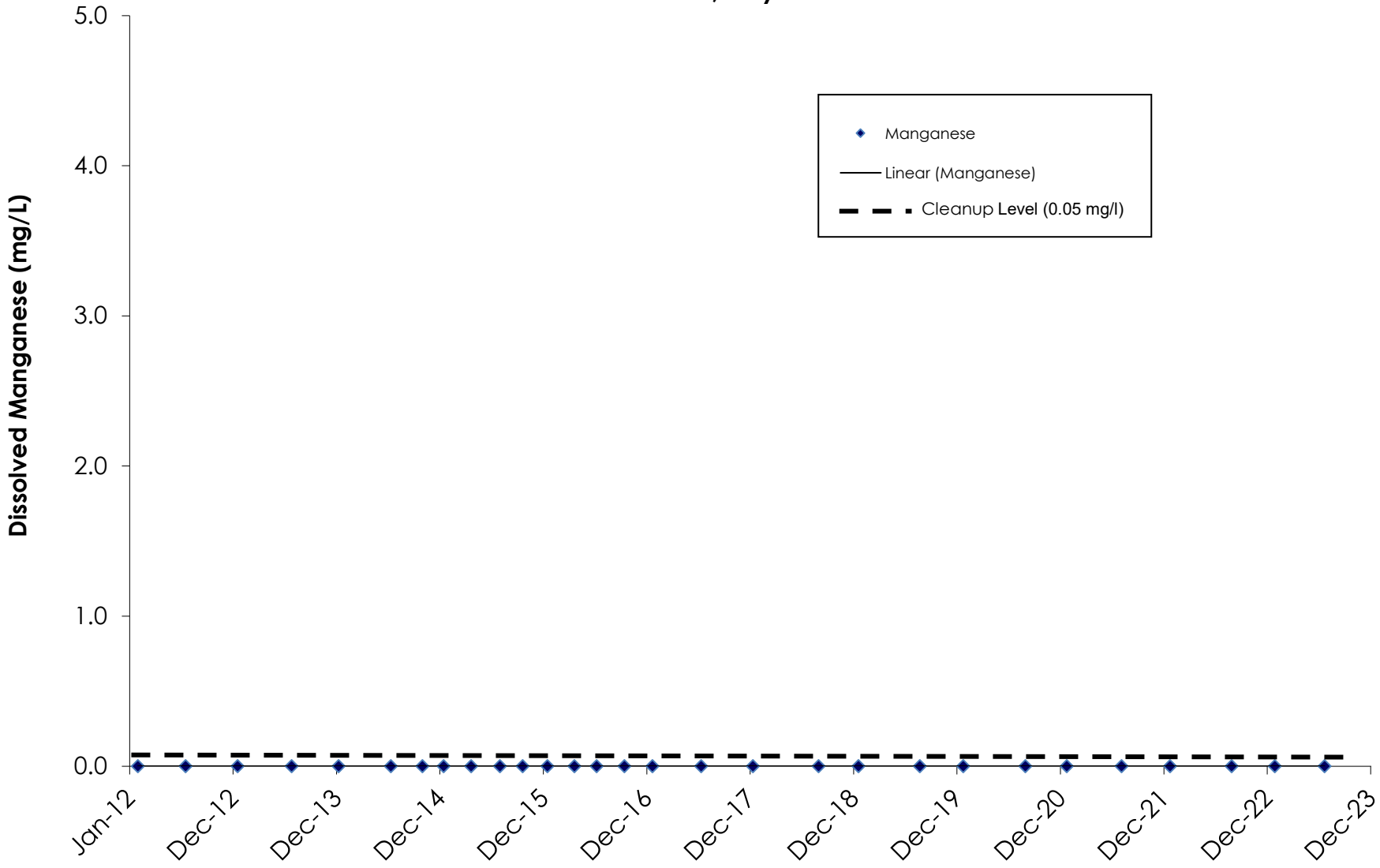


Figure 25

Dissolved Manganese

Upper Regional Aquifer, Hidden Valley Landfill

Well MW-13D, 10 year trend

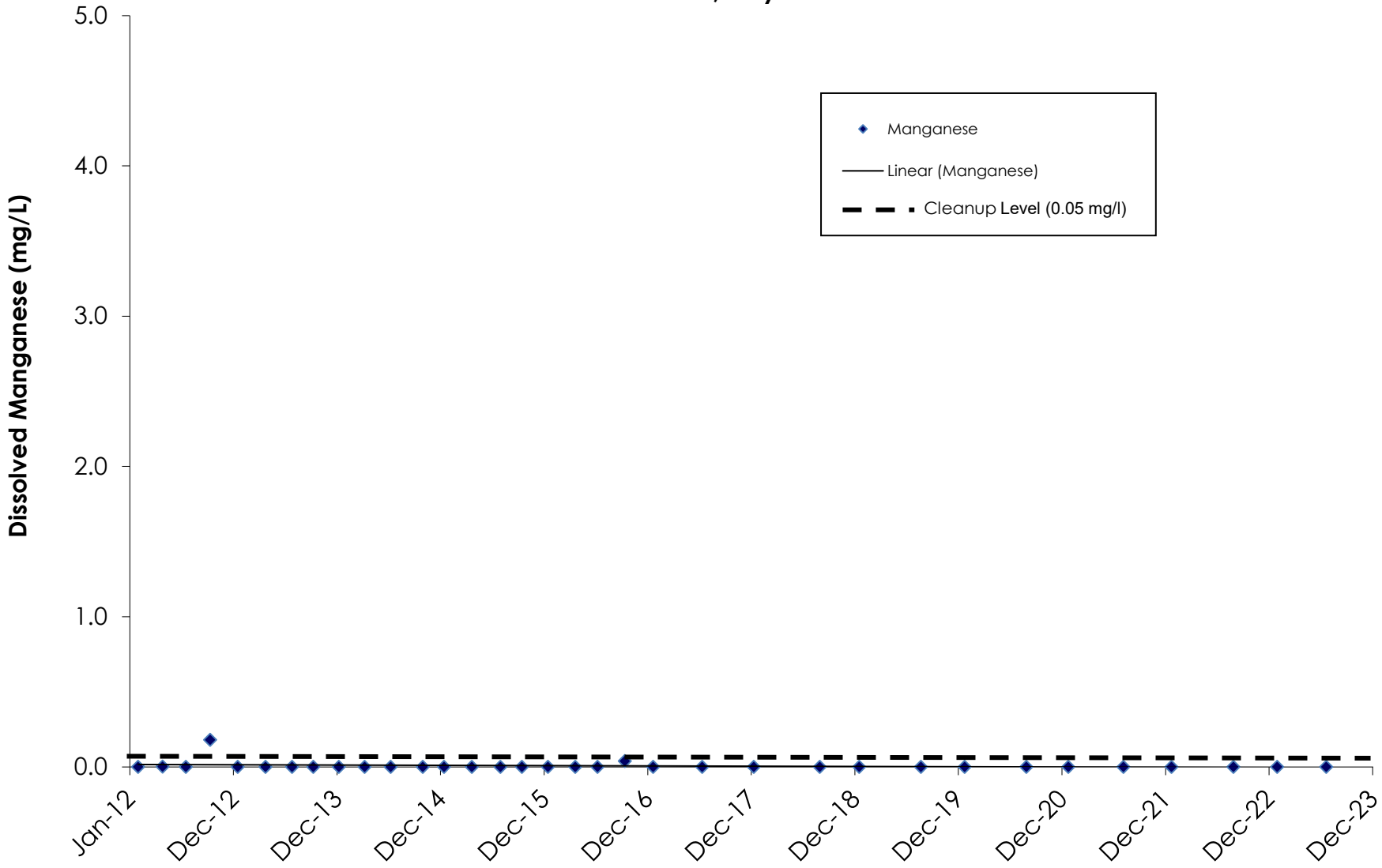
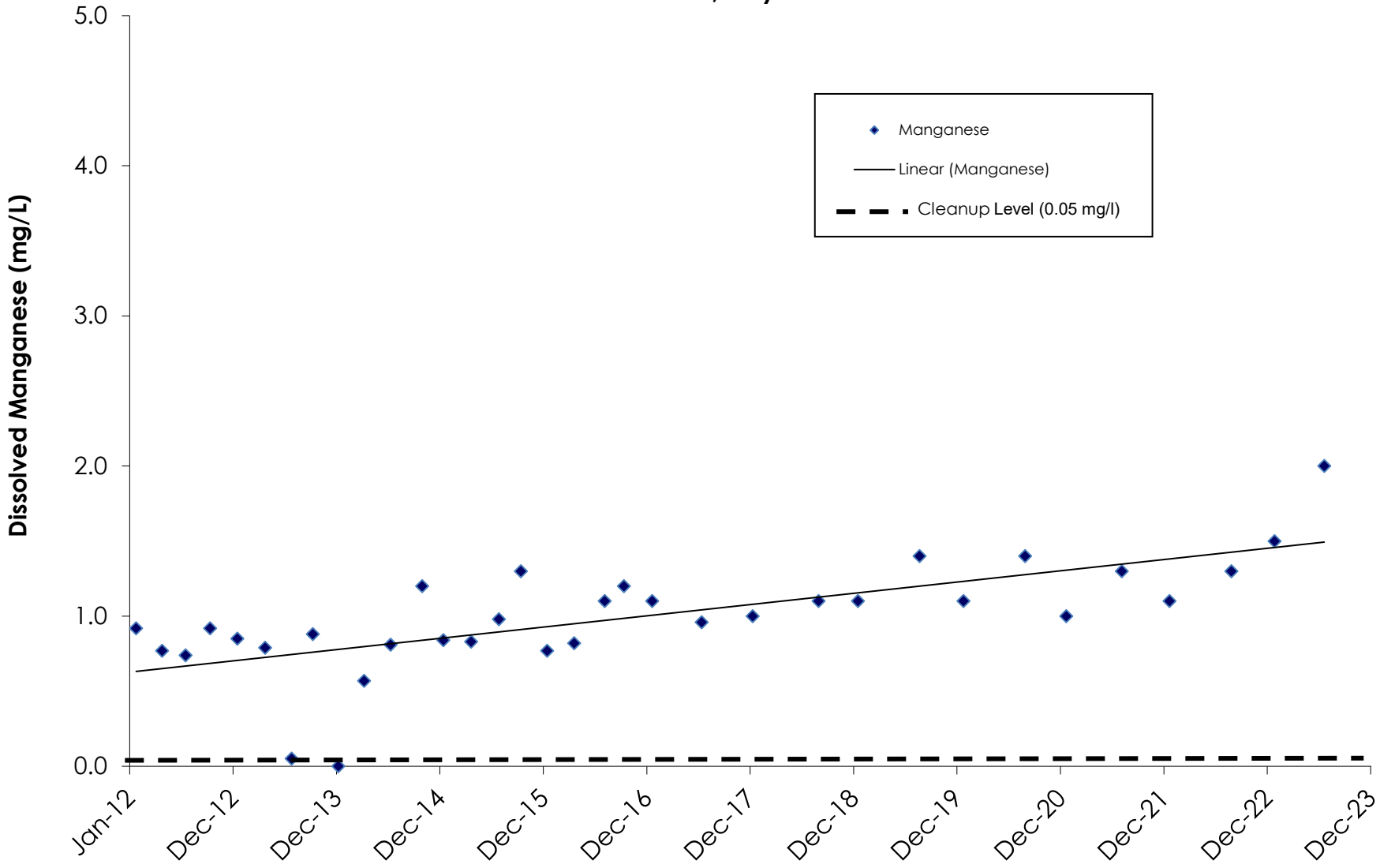


Figure 26

Dissolved Manganese

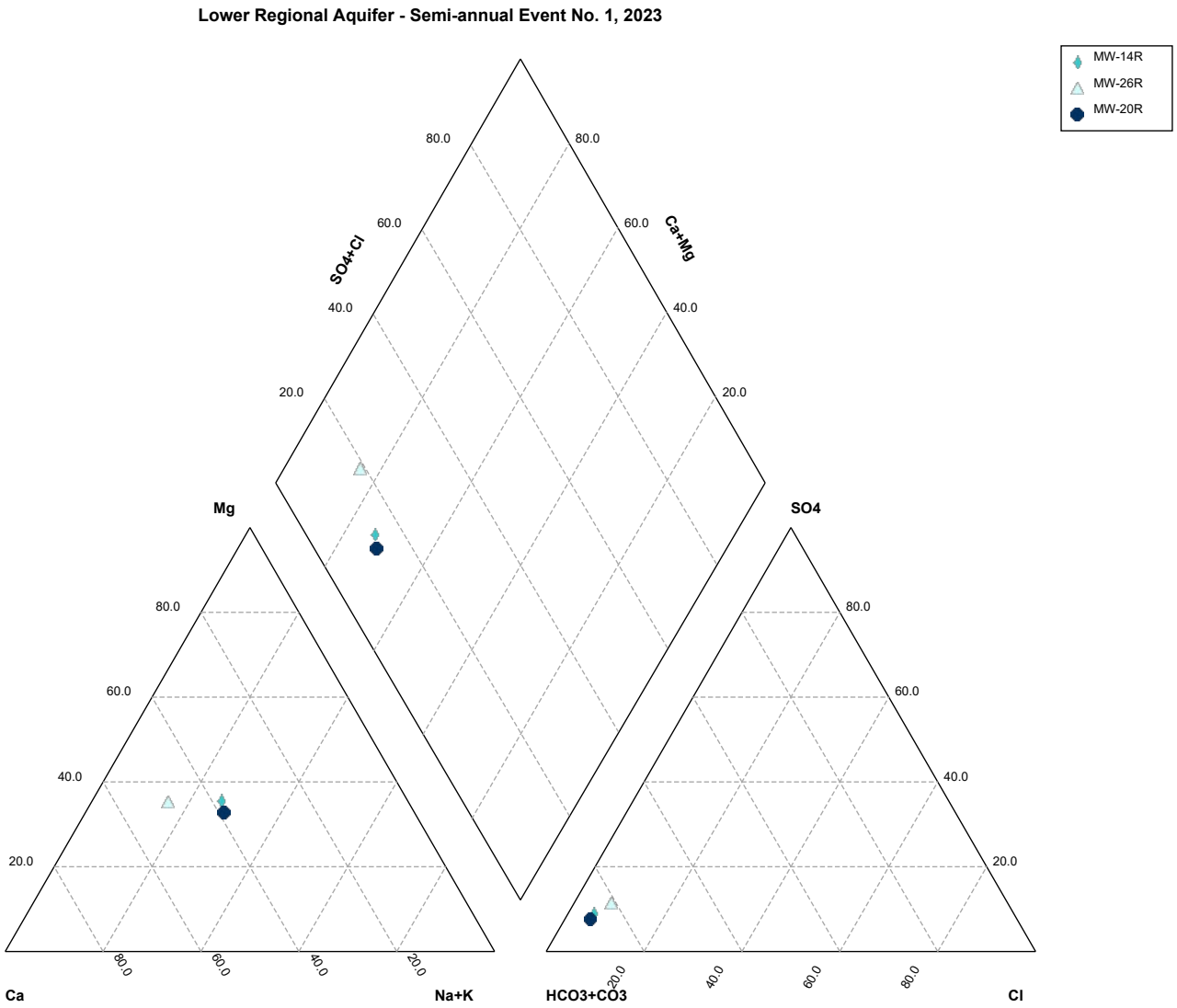
Upper Regional Aquifer, Hidden Valley Landfill

Well MW-14D, 10 year trend



Appendix F

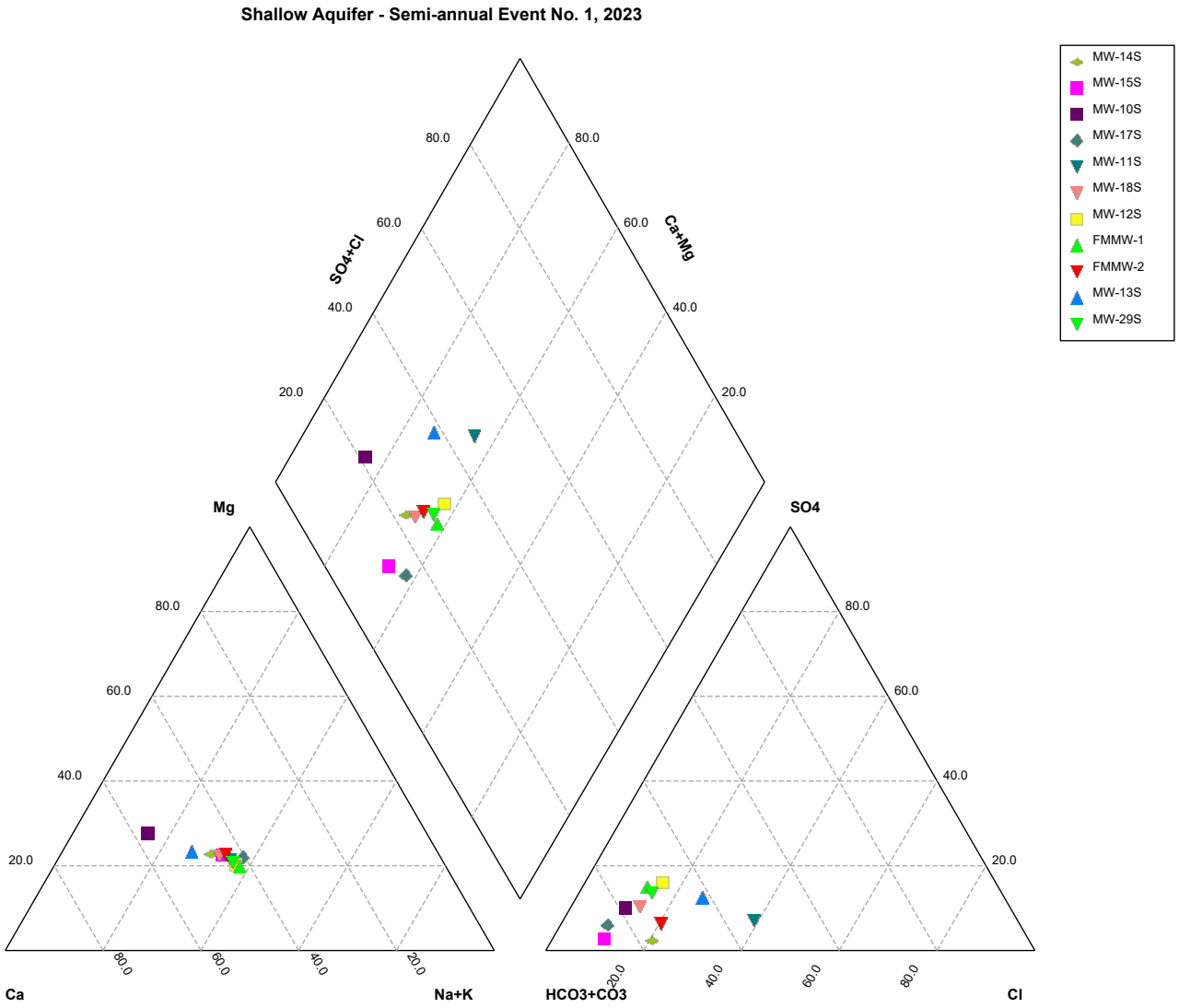
TRILINEAR DIAGRAMS



Hidden Valley Landfill

Lower Regional Aquifer Trilinear Diagram

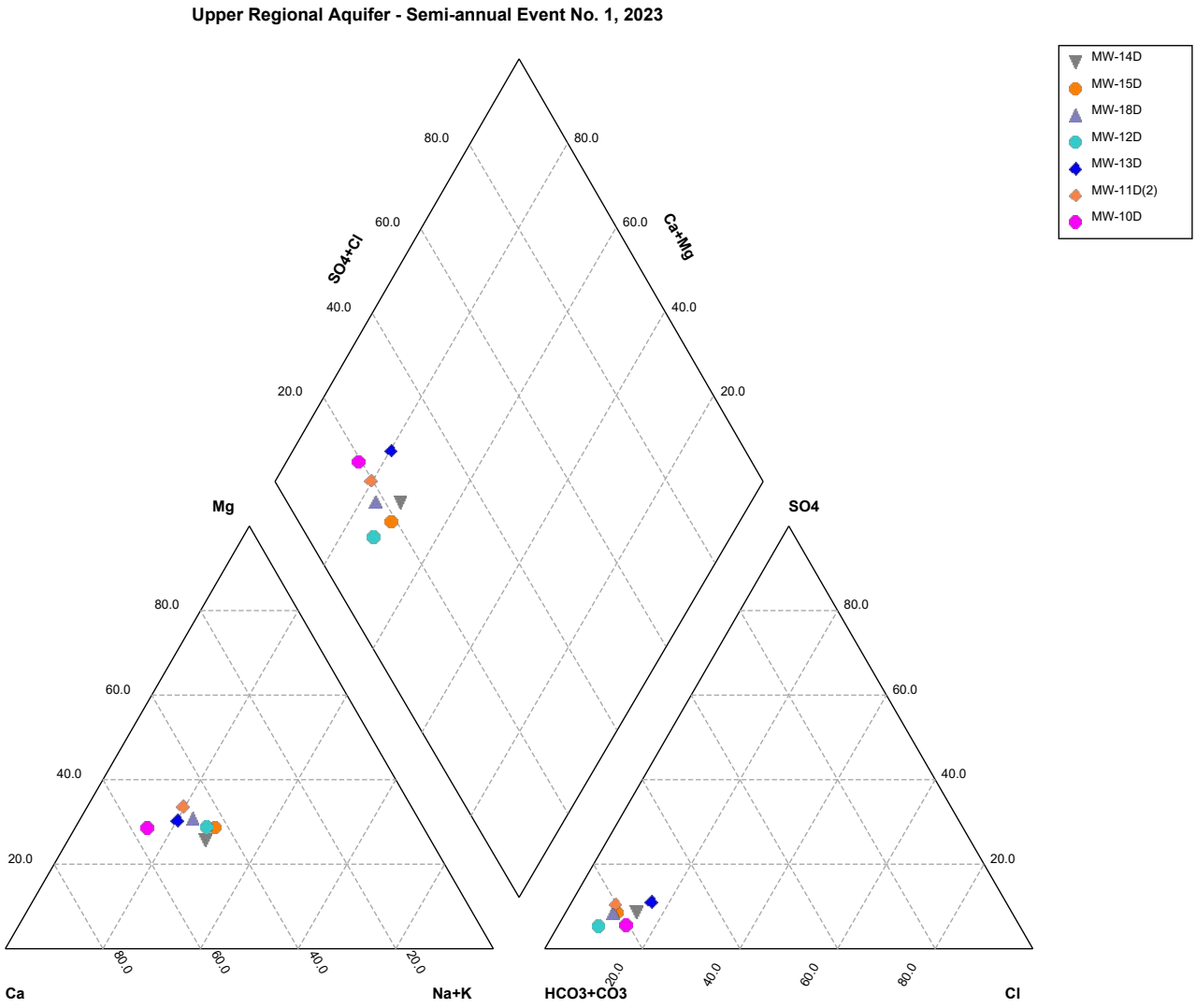
LRI Hidden Valley
04223002.03
June 19, 2023



Hidden Valley Landfill

Shallow Aquifer Trilinear Diagram

LRI Hidden Valley
04223002.03
June 19, 2023

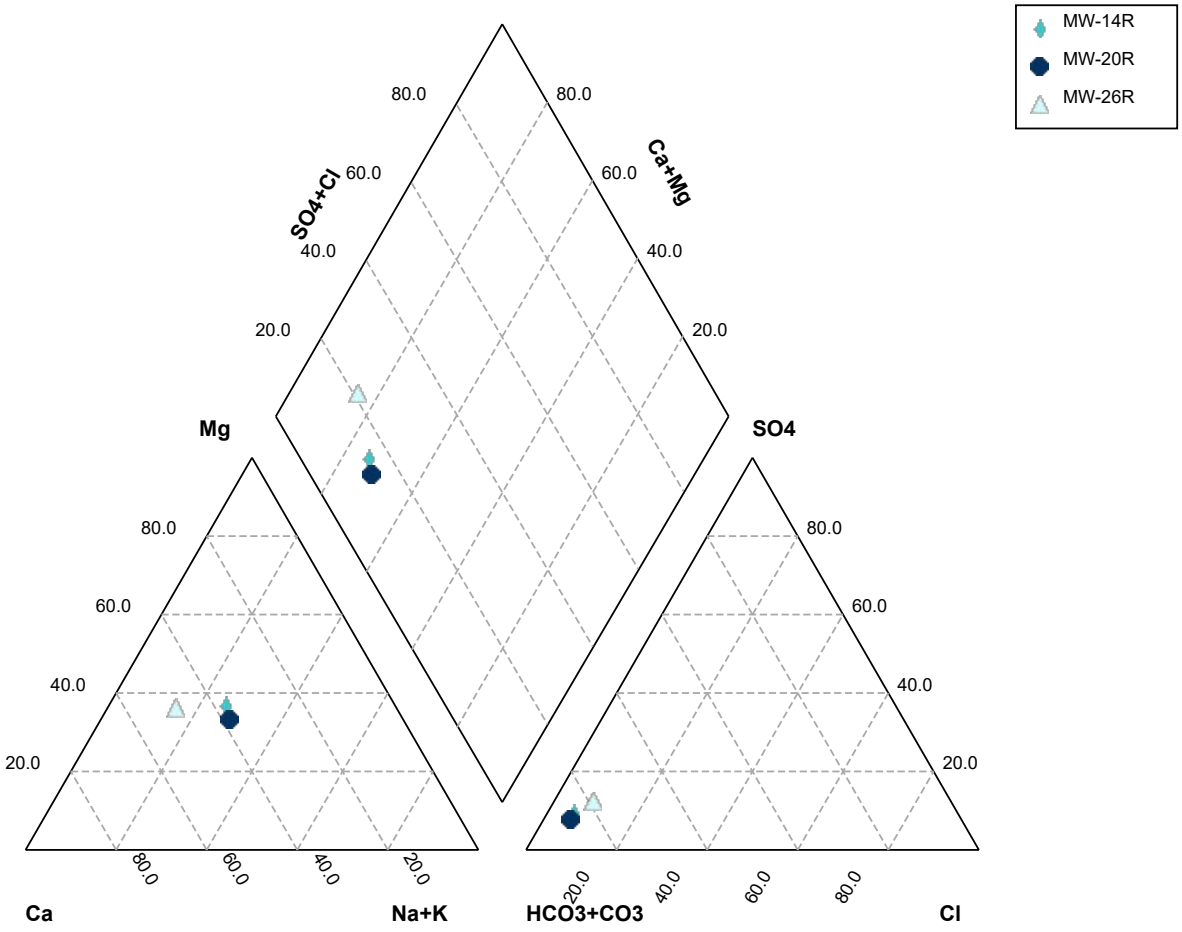


Hidden Valley Landfill

Upper Regional Aquifer Trilinear Diagram

LRI Hidden Valley
04223002.03
June 19, 2023

Lower Regional Aquifer - Semi-annual Event No. 2, 2023

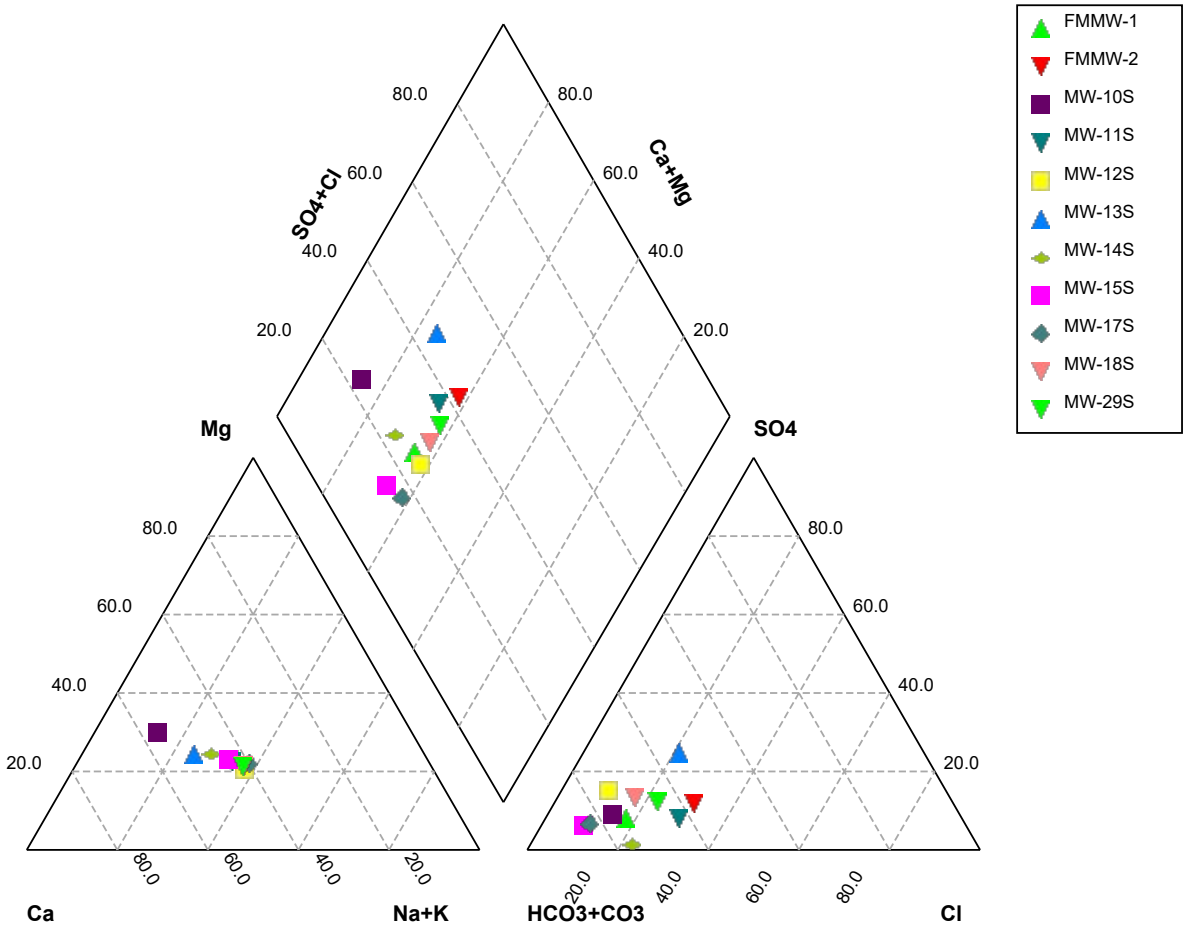


Hidden Valley Landfill

Lower Regional Aquifer Trilinear Diagram

LRI Hidden Valley
04223002.03
August 25, 2023

Shallow Aquifer - Semi-annual Event No. 2, 2023

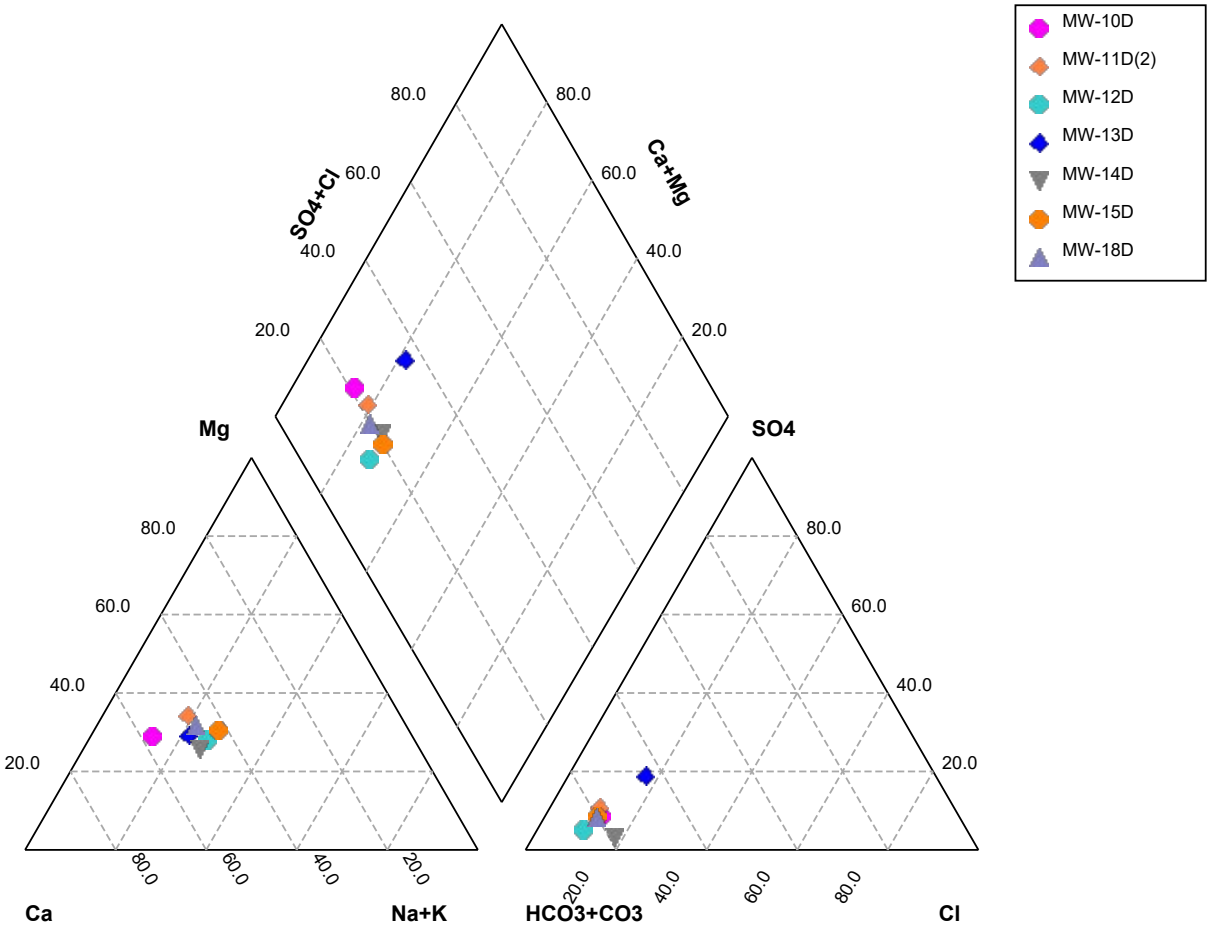


Hidden Valley Landfill

Shallow Aquifer Trilinear Diagram

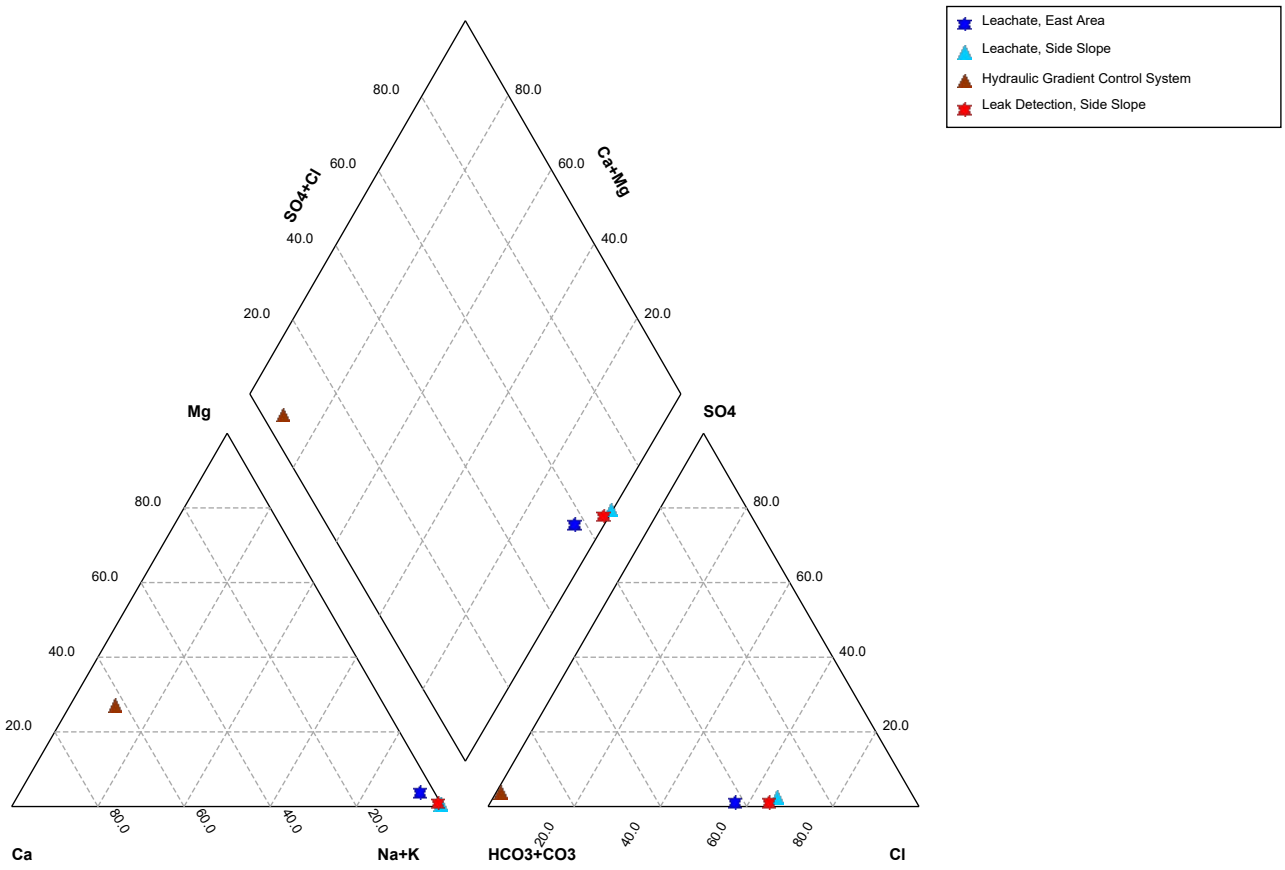
LRI Hidden Valley
04223002.03
August 25, 2023

Upper Regional Aquifer - Semi-annual Event No. 2, 2023



Hidden Valley Landfill Upper Regional Aquifer Trilinear Diagram	**LRI Hidden Valley** 04223002.03 August 25, 2023

Leachate and Leak Detection Locations - May, 2023



Hidden Valley Landfill Leachate and Leak Detection Trilinear Diagram	**LRI Hidden Valley** 04223002.03 June 19, 2023

Appendix G

STATISTICAL CALCULATIONS

Statistical Summary of Groundwater Data - Inorganics
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	Specific Conductance		Alkalinity		Chloride		Ammonia		Nitrate		Sulfate		TDS		TOC	
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-10D																	
MW-10D	1/14/2019	258	258	110	110	5.7	5.7	0.1 L	0.05	0.85	0.85	9.2	9.2	180	180	1.0 L	1.0
MW-10D	8/20/2019	193	193	72	72	5.1	5.1	0.1 L	0.05	2.1	2.10	8.8	8.8	140	140	1.0 L	0.5
MW-10D	1/22/2020	265	265	110	110	8.9	8.9	0.1 L	0.05	1.3	1.30	11	11.0	160	160	1.0 L	1.0
MW-10D	8/25/2020	258	258	120	120	7.1	7.1	0.1 L	0.05	0.56	0.56	15	15.0	180	180	1.0 L	0.5
MW-10D	1/20/2021	193.9	194	82	82	5.4	5.4	0.1 L	0.05	2.3	2.30	8.6	8.6	110	110	1.0 L	0.5
MW-10D	8/3/2021	282	282	130	130	6.5	6.5	0.1 L	0.05	0.58	0.58	13	13.0	140	140	1.1 L	1.1
MW-10D	1/19/2022	194	194	76	76	5.2	5.2	0.1 L	0.05	1.8	1.80	8	8.0	130	130	1.0 L	0.5
MW-10D	8/24/2022	242	242	110	110	6.5	6.5	0.1 L	0.05	1	1.00	9.4	9.4	130	130	1.0 L	0.5
MW-10D	1/24/2023	277	277	100	100	10	10	0.1 L	0.05	1.8	1.80	8	8.0	130	130	1.0 L	0.5
MW-10D	7/19/2023	330	330	130	130	12	12	0.1 L	0.05	0.84	0.84	11	11.0	170	170	1.3	1.3
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		0		10		10		10		1	
Minimum conc.			193		72		5.1		0.050		0.56		8.0		110		0.5
Maximum conc.			282		130		12.0		0.05		2.3		15		180		1.1
Average conc.			236		104		7.2		0.050		1.3		10.2		147		0.7
Distribution			Lognormal		Lognormal		Lognormal		NC		Lognormal		Neither		Lognormal		NC
UCL 95			257		113		6.9		NC		2.2		15*		162		NC

Statistical Summary of Groundwater Data - Inorganics
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	Specific Conductance		Alkalinity		Chloride		Ammonia		Nitrate		Sulfate		TDS		TOC	
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-10S																	
MW-10S	1/14/2019	254	254	110	110	6.1	6.1	0.19	0.19	0.81	0.81	9.6	9.6	160	160	1.1	1.1
MW-10S	8/20/2019	306	306	130	130	7.7	7.7	0.1 L	0.05	0.2 L	0.10	17	17.0	180	180	1.6	1.6
MW-10S	1/21/2020	269	269	100	100	11	11.0	0.1 L	0.05	1.3	1.30	11	11.0	160	160	1.1	1.1
MW-10S	8/25/2020	298	298	110	110	7.2	7.2	0.1 L	0.05	0.87	0.87	15	15.0	180	180	1.4	1.4
MW-10S	1/20/2021	332	332	150	150	8.9	8.9	0.1 L	0.05	1.9	1.90	15	15.0	180	180	1.3	1.3
MW-10S	8/2/2021	282	282	120	120	7	7.0	0.1 L	0.05	0.66	0.66	11	11.0	150	150	1.1	1.1
MW-10S	1/18/2022	226	226	94	94	7.7	7.7	0.1 L	0.05	1.7	1.70	12	12.0	140	140	1.0 L	0.5
MW-10S	8/24/2022	243	243	100	100	6.6	6.6	0.1 L	0.05	1	1.00	9.5	9.5	130	130	1.0 L	0.5
MW-10S	1/24/2023	263	263	94	94	8.3	8.3	0.1 L	0.05	0.2 L	0.10	10	10.0	130	130	1.0	1.0
MW-10S	7/19/2023	308	308	120	120	13	13	0.1 L	0.05	0.92	0.92	11	11.0	170	170	1.3	1.3
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		3		9		10		10		8	
Minimum conc.			226		94		6.1		0.05		0.10		9.5		130		0.5
Maximum conc.			332		150		13.0		0.19		1.9		17		180		1.6
Average conc.			278		113		8.4		0.06		0.9		12		158		1.1
Distribution			Lognormal		Lognormal		Neither		NC		Lognormal		Lognormal		Lognormal		Neither
UCL 95			296		150*		11.0*		NC		1.9*		17.0*		170		1.6*

Statistical Summary of Groundwater Data - Inorganics
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	Specific Conductance		Alkalinity		Chloride		Ammonia		Nitrate		Sulfate		TDS		TOC	
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-11D(2)																	
MW-11D(2)	1/15/2019	211	211	82	82	5.6	5.6	0.1 L	0.05	1.9	1.9	9.4	9.4	140	140	1.0 L	0.5
MW-11D(2)	8/21/2019	215	215	83	83	5.5	5.5	0.1 L	0.05	1.8	1.8	9.3	9.3	150	150	1.0 L	0.5
MW-11D(2)	1/22/2020	210	210	83	83	5.8	5.8	0.1 L	0.05	1.8	1.8	9	9.0	140	140	1.0 L	0.5
MW-11D(2)	8/26/2020	328	328	86	86	5.4	5.4	0.1 L	0.05	1.8	1.8	8.3	8.3	150	150	1.0 L	0.5
MW-11D(2)	1/20/2021	197	197	86	86	5.1	5.1	0.1 L	0.05	1.9	1.9	7	7.0	150	150	1.0 L	0.5
MW-11D(2)	8/3/2021	209	209	89	89	5.0	5	0.1 L	0.05	1.7	1.7	7.8	7.8	320	320	1.0 L	0.5
MW-11D(2)	1/18/2022	218	218	87	87	5.2	5.2	0.1 L	0.05	2.1	2.1	7.8	7.8	130	130	1.0 L	0.5
MW-11D(2)	8/24/2022	207	207	84	84	5.2	5.2	0.1 L	0.05	1.8	1.8	8.0	8.0	120	120	1.0 L	0.5
MW-11D(2)	1/24/2023	202	202	87	87	5.6	5.6	0.1 L	0.05	1.9	1.9	8.7	8.7	140	140	1.0 L	0.5
MW-11D(2)	7/18/2023	211	211	81	81	6.6	6.6	0.1 L	0.05	1.8	1.8	8.8	8.8	150	150	1.0 L	0.5
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		0		10		10		10		0	
Minimum conc.			197		81		5.0		0.05		1.7		7.0		120		0.5
Maximum conc.			328		89		6.6		0.05		2.1		9.4		320		0.5
Average conc.			221		85		5.5		0.05		1.9		8.4		159		0.5
Distribution			Neither		Lognormal		Lognormal		NC		Lognormal		Lognormal		Neither		NC
UCL 95			328*		86		5.6		NC		1.9*		9.0		320*		NC

Statistical Summary of Groundwater Data - Inorganics
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	Specific Conductance		Alkalinity		Chloride		Ammonia		Nitrate		Sulfate		TDS		TOC	
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-11S																	
MW-11S	1/15/2019	211	211	54	54	17	17	0.1 L	0.05	3.2	3.2	7.4	7.4	140	140	1.0 L	0.5
MW-11S	8/21/2019	257	257	100	100	11	11	0.1 L	0.05	0.86	0.86	8.2	8.2	170	170	1.0 L	0.5
MW-11S	1/22/2020	244	244	62	62	19	19	0.1 L	0.05	3.8	3.8	9.1	9.1	170	170	1.0 L	0.5
MW-11S	8/26/2020	422	422	100	100	18	18	0.1 L	0.05	1.30	1.3	9	9	200	200	1.0 L	0.5
MW-11S	1/19/2021	333	333	90	90	16	16	0.1 L	0.05	7.8	7.8	15	15	210	210	1.1	1.1
MW-11S	8/3/2021	296	296	120	120	16	16	0.12	0.12	0.55	0.55	8.5	8.5	160	160	1.1	1.1
MW-11S	1/18/2022	340	340	100	100	19	19	0.1 L	0.05	6.1	6.1	11	11	210	210	1.0	1.0
MW-11S	8/24/2022	296	296	120	120	13	13	0.17	0.17	0.27	0.27	5.0	5.0	160	160	1.4	1.4
MW-11S	1/24/2023	302	302	100	100	34	34	0.1 L	0.05	3.9	3.9	8.4	8.4	32	32	1.5	1.5
MW-11S	7/18/2023	299	299	99	99	27	27	0.1 L	0.05	1.6	1.6	9.9	9.9	170	170	1.0 L	0.5
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		2		10		10		10		5	
Minimum conc.			211		54		11.0		0.05		0.27		5.0		32		0.5
Maximum conc.			422		120		34.0		0.17		7.8		15.0		210		1.5
Average conc.			300		95		19.0		0.07		2.9		9.2		162		0.9
Distribution			Lognormal		Lognormal		Lognormal		NC		Lognormal		Lognormal		Neither		Neither
UCL 95			332		108		17.8		NC		13.9		11.6		210*		1.4*

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-12S																	
MW-12S	1/14/2019	518	518	59	59	9.2	9.2	1.4	1.4	40.0	19.0	3.1	3.1	380	380	1.6	1.6
MW-12S	8/21/2019	326	326	160	160	10.0	10.0	1.0	2.9	1.3	1.4	8.70	8.7	220	220	1.7	1.7
MW-12S	1/21/2020	296	296	22	22	6.5	6.5	0.1 L	0.05	22.0	40.0	5.9	5.9	240	240	1.2	1.2
MW-12S	8/27/2020	272	272	110	110	12.0	12.0	0.5	1	5.6	1.3	5.30	5.3	230	230	1.8	1.8
MW-12S	1/20/2021	332	332	49	49	18.0	18.0	0.1 L	0.05	15.0	22.0	8.0	8	230	230	1.5	1.5
MW-12S	8/2/2021	381	381	180	180	12.0	12.0	1.6	0.5	0.7	5.6	1.0	0.98	180	180	1.9	1.9
MW-12S	1/19/2022	370	370	56	56	32.0	32.0	0.1 L	0.05	12.0	15.0	17.0	17	250	250	1.5	1.5
MW-12S	8/25/2022	364	364	160	160	11.0	11.0	2.6	1.6	0.2 L	0.1	9.6	9.6	220	220	1.7	1.7
MW-12S	1/24/2023	302	302	56	56	11.0	11.0	1.1	1.1	8.0	8.0	15.0	15.0	150	150	1.9	1.9
MW-12S	7/19/2023	287	287	100	100	8.0	8.0	1.5	1.5	1.3	1.3	16.0	16.0	180	180	1.4	1.4
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		7		9		10		10		10	
Minimum conc.			272		22		6.5		0.05		0.1		0.98		150		1.2
Maximum conc.			518		180		32.0		2.90		40.0		17.0		380		1.9
Average conc.			345		95		13.0		1.02		11.4		9.0		228		1.6
Distribution			Neither		Lognormal		Neither		Normal		Lognormal		Lognormal		Neither		Lognormal
UCL 95			518*		188		32.0*		1.8		40.0*		19.6		380*		1.9

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-12D																	
MW-12D	1/16/2019	291	291	160	160	8.7	8.7	0.1 L	0.05	1.2	1.2	7.1	7.1	200	200	1.0 L	0.5
MW-12D	8/21/2019	321	321	140	140	9.0	9.0	0.1 L	0.05	1.1	1.1	7.2	7.2	210	210	1.0 L	0.5
MW-12D	1/21/2020	330	330	160	160	9.4	9.4	0.1 L	0.05	0.9	0.93	6.8	6.8	200	200	1.0 L	0.5
MW-12D	8/27/2020	321	321	130	130	8.7	8.7	0.1 L	0.05	1.2	1.2	7.1	7.1	210	210	1.0 L	0.5
MW-12D	1/20/2021	286	286	140	140	8.1	8.1	0.1 L	0.05	1.2	1.2	5.8	5.8	190	190	1.0 L	0.5
MW-12D	8/2/2021	305	305	140	140	7.8	7.8	0.1 L	0.05	1.1	1.1	5.8	5.8	170	170	1.0 L	0.5
MW-12D	1/20/2022	329	329	140	140	8.5	8.5	0.1 L	0.05	1.1	1.1	6.7	6.7	190	190	1.0 L	0.5
MW-12D	8/25/2022	313	313	140	140	8.1	8.1	0.14	0.14	1.1	1.1	6.8	6.8	170	170	1.0 L	0.5
MW-12D	1/24/2023	343	343	140	140	9.0	9.0	0.1 L	0.05	0.92	0.92	7.7	7.7	170	170	1.1	1.1
MW-12D	7/19/2023	385	385	170	170	12.0	12	0.1 L	0.05	0.69	0.69	8	8	210	210	1.0 L	0.5
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		1		10		10		10		1	
Minimum conc.			286		130		7.8		0.05		0.7		5.8		170		0.5
Maximum conc.			385		170		12.0		0.14		1.2		8.0		210		1.1
Average conc.			322		146		8.9		0.06		1.1		6.9		192		0.6
Distribution			Lognormal		Neither		Lognormal		NC		Neither		Neither		Lognormal		NC
UCL 95			318		160*		8.8		NC		1.5*		7.6*		199		NC

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-13D																	
MW-13D	1/14/2019	270	270	100	100	8.9	8.9	0.1 L	0.05	0.99	1.0	13	13	180	180	1.0 L	0.5
MW-13D	8/20/2019	298	298	120	120	8.2	8.2	0.1 L	0.05	0.2	0.1	19	19	180	180	1.1	1.1
MW-13D	1/21/2020	280	280	100	100	13.0	13.0	0.1 L	0.05	1	1.0	12	12	170	170	1.0 L	0.5
MW-13D	8/25/2020	302	302	110	110	8.1	8.1	0.1 L	0.05	0.2	0.1	20	20	190	190	1.0 L	0.5
MW-13D	1/20/2021	287	287	130	130	8.9	8.9	0.1 L	0.05	1	1.0	11	11	160	160	1.0 L	0.5
MW-13D	8/3/2021	299	299	130	130	7.4	7.4	0.1 L	0.05	0.4	0.4	16	16	180	180	1.0 L	0.5
MW-13D	1/19/2022	285	285	110	110	12.0	12.0	0.1 L	0.05	3.2	3.2	13	13	180	180	1.0 L	0.5
MW-13D	8/25/2022	251	251	110	110	7.9	7.9	0.1 L	0.05	0.68	0.7	14	14	150	150	1.0 L	0.5
MW-13D	1/24/2023	269	269	110	110	13.0	13.0	0.1 L	0.05	1.4	1.4	12	12	110	110	1.0 L	0.5
MW-13D	7/18/2023	229	229	78	78	12.0	12.0	0.1 L	0.05	1	1.0	18	18	160	160	1.0 L	0.5
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		0		10		10		10		1	
Minimum conc.			229		78		7.4		0.05		0.10		11		110		0.5
Maximum conc.			302		130		13.0		0.05		3.2		20		190		1.1
Average conc.			277		110		9.9		0.05		1.0		14.8		166		0.6
Distribution			Lognormal		Lognormal		Neither		NC		Normal		Lognormal		Neither		NC
UCL 95			310		123		13.0*		NC		2.3		17.2		200*		1.1

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-13S																	
MW-13S	1/14/2019	204	204	70	70	8.0	8.0	0.1 L	0.05	1.2	1.2	15	15	150	150	1.1	1.1
MW-13S	8/20/2019	257	257	100	100	6.5	6.5	0.1 L	0.05	0.2 L	0.1	19.0	19.0	160	160	1.0 L	0.5
MW-13S	1/21/2020	210	210	64	64	15.0	15.0	0.1 L	0.05	1.3	1.3	10	10	150	150	1.0 L	0.5
MW-13S	8/25/2020	270	270	99	99	6.4	6.4	0.1 L	0.05	0.2 L	0.1	19	19	170	170	1.0 L	0.5
MW-13S	1/20/2021	198	198	75	75	5.0	5.0	0.1 L	0.05	2.0	2	6	6	140	140	1.0 L	0.5
MW-13S	8/3/2021	263	263	110	110	6.0	6.0	0.1 L	0.05	0.4	0.4	16	16	99	99	1.0 L	0.5
MW-13S	1/19/2022	256	256	61	61	14.0	14.0	0.1 L	0.05	7.7	7.7	13	13	170	170	1.0 L	0.5
MW-13S	8/25/2022	185	185	77	77	5.8	5.8	0.1 L	0.05	0.6	0.6	13	13	110	110	1.0 L	0.5
MW-13S	1/24/2023	202	202	61	61	15.0	15.0	0.1 L	0.05	1.9	1.9	10	10	120	120	1.0 L	0.5
MW-13S	7/18/2023	186	186	53	53	12.0	12.0	0.17	0.17	1.1	1.1	19	19	140	140	1.0 L	0.5
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		1		8		10		10		1	
Minimum conc.			185		53		5.0		0.05		0.1		5.6		99		0.5
Maximum conc.			270		110		15.0		0.17		7.7		19.0		170		1.1
Average conc.			223		77		9.4		0.06		1.6		13.9		141		0.6
Distribution			Lognormal		Lognormal		Lognormal		NC		Lognormal		Lognormal		Normal		NC
UCL 95			272		100		11.5		NC		7.0		19.3		169		1.2

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-14D																	
MW-14D	1/14/2019	230	230	88	88	8.3	8.3	3.7	3.7	0.2 L	0.1	9.3	9.3	160	160	1.9	1.9
MW-14D	8/20/2019	289	289	120	120	12.0	12.0	3.8	3.8	0.2 L	0.1	7.5	7.5	170	170	1.8	1.8
MW-14D	1/22/2020	219	219	89	89	6.2	6.2	3.1	3.1	0.2 L	0.1	7.9	7.9	130	130	2.0	2
MW-14D	8/26/2020	262	262	100	100	9.7	9.7	3.4	3.4	0.2 L	0.1	9.3	9.3	180	180	1.6	1.6
MW-14D	1/19/2021	219	219	89	89	7.0	7.0	3.1	3.1	0.2 L	0.1	7.6	7.6	120	120	1.9	1.9
MW-14D	8/3/2021	274	274	120	120	8.5	8.5	3.6	3.6	0.2 L	0.1	9.5	9.5	430	430	1.6	1.6
MW-14D	1/18/2022	221	221	98	98	8.5	8.5	3.0	3.0	0.2 L	0.1	6.9	6.9	150	150	1.6	1.6
MW-14D	8/24/2022	261	261	110	110	8.4	8.4	3.4	3.4	0.2 L	0.1	11.0	11.0	130	130	1.5	1.5
MW-14D	1/24/2023	304	304	98	98	12.0	12.0	3.4	3.4	0.2 L	0.1	9.8	9.8	130	130	1.8	1.8
MW-14D	7/18/2023	372	372	150	150	20.0	20.0	4.1	4.1	1.6	1.6	4.8	4.8	230	230	2.1	2.1
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		10		1		10		10		10	
Minimum conc.			219		88		6.2		3		0.1		4.8		120		1.5
Maximum conc.			372		150		20		4.1		1.6		11.0		430		2.1
Average conc.			265		106		10		3.5		0.3		8		183		1.8
Distribution			Lognormal		Lognormal		Lognormal		Lognormal		NC		Lognormal		Neither		Lognormal
UCL 95			262		107		10.2		3.7		NC		10.6		430*		1.8

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-14R																	
MW-14R	1/8/2018	105	105	44	44	1.6	1.6	0.1 L	0.05	0.2 L	0.01	3.5	3.5	120	120	1.0 L	0.5
MW-14R	8/27/2018	113	113	49	49	1.7	1.7	0.1 L	0.05	0.2 L	0.01	3.4	3.4	97	97	1.0 L	0.5
MW-14R	1/14/2019	104	104	48	48	1.6	1.6	0.1 L	0.05	0.2 L	0.01	3.6	3.6	100	100	1.0 L	0.5
MW-14R	8/20/2019	196	196	50	50	1.6	1.6	0.1 L	0.05	0.2 L	0.01	3.8	3.8	110	110	1.0 L	0.5
MW-14R	1/21/2020	104	104.2	48	48	1.6	1.6	0.1 L	0.05	0.2 L	0.01	3.7	3.7	80	80	1.0 L	0.5
MW-14R	8/25/2020	104	104	51	51	1.5	1.5	0.1	0.11	0.2 L	0.01	2.9	2.9	95	95	1.0 L	0.5
MW-14R	1/19/2021	78	78	53	53	1.5	1.5	0.1 L	0.05	0.2 L	0.01	3.7	3.7	100	100	1.0 L	0.5
MW-14R	8/2/2021	103	103	51	51	1.5	1.5	0.1 L	0.05	0.2 L	0.01	3.6	3.6	88	88	1.0 L	0.5
MW-14R	1/24/2023	108	108	53	53	1.8	1.8	0.1 L	0.05	0.2 L	0.01	4.2	4.2	10 L	5	1.0 L	0.5
MW-14R	7/19/2023	100	100	48	48	1.9	1.9	0.1 L	0.05	0.2 L	0.01	4.1	4.1	93	93	1.0 L	0.5
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		1		0		10		9		0	
Minimum conc.			78		44		1.5		0.05		0.0		2.9		5		0.5
Maximum conc.			196		53		1.9		0.11		0.0		4.2		120		0.5
Average conc.			112		50		1.6		0.06		0.0		3.7		89		0.5
Distribution			Neither		Lognormal		Neither		NC		NC		Neither		Lognormal		NC
UCL 95			196*		50		1.7*		NC		NC		3.8*		106		NC

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-14S																	
MW-14S	1/14/2019	127	127	46	46	3.1	3.1	0.48	0.48	0.8	0.8	5.5	5.5	95	95	1.9	1.9
MW-14S	1/22/2020	113	113	41	41	2.7	2.7	0.1 L	0.05	1.6	1.6	5.1	5.1	86	86	1.8	1.8
MW-14S	1/19/2021	98	98	39	39	2.4	2.4	0.1 L	0.05	0.6	0.6	3.4	3.4	56	56	1.8	1.8
MW-14S	8/3/2021	319	319	130	130	18.0	18.0	0.8	0.76	0.2 L	0.1	5.4	5.4	71	71	2.4	2.4
MW-14S	1/18/2022	111	111	48	48	3.6	3.6	0.1	0.05	0.91	0.91	4.4	4.4	76	76	1.6	1.6
MW-14S	8/24/2022	310	310	130	130	17.0	17.0	0.84	0.84	0.2 L.	0.1	3.6	3.6	160	160	2.5	2.5
MW-14S	1/24/2023	325	325	48	48	20.0	20.0	0.53	0.53	0.2 L	0.1	3.2	3.2	10 L	5	2.6	2.6
MW-14S	7/18/2023	383	383	160	160	27.0	27.0	1.2	1.2	0.71	0.71	2.5	2.5	230	230	2.6	2.6
No. Analyzed		8		8		8		8		8		8		8		8	
No. Detect		8		8		8		6		5		8		7		8	
Minimum conc.			98		39		2.4		0.05		0.1		2.5		5		1.6
Maximum conc.			383		160		27		1.2		1.6		5.5		230		2.6
Average conc.			223		80		11.7		0.495		0.6		4.1		97		2.2
Distribution			Neither		Neither		Neither		Neither		Neither		Lognormal		Lognormal		Lognormal
UCL 95			319*		130*		21*		0.84*		1.6*		6.0		138		2.2

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-15D																	
MW-15D	1/14/2019	286	286	120	120	9.3	9.3	0.1 L	0.05	0.7	0.7	9.6	9.6	190	190	1.0 L	0.5
MW-15D	8/20/2019	308	308	130	130	9.3	9.3	0.1 L	0.05	0.66	0.66	11.0	11.0	170	170	1.0 L	0.5
MW-15D	1/21/2020	309	309	130	130	9.4	9.4	0.1 L	0.05	0.66	0.66	11.0	11.0	180	180	1.0 L	0.5
MW-15D	8/26/2020	294	294	110	110	8.8	8.8	0.1 L	0.05	0.65	0.65	11.0	11.0	210	210	1.0 L	0.5
MW-15D	1/19/2021	279.8	279.8	120	120	9.3	9.3	0.1 L	0.05	0.67	0.67	11.0	11.0	160	160	1.0 L	0.5
MW-15D	8/2/2021	277	277	120	120	8.3	8.3	0.1 L	0.05	0.70	0.70	8.9	8.9	160	160	1.0 L	0.5
MW-15D	1/18/2022	157	157	130	130	8.6	8.6	0.1 L	0.05	0.80	0.80	10.0	10.0	170	170	1.0 L	0.5
MW-15D	8/25/2022	274	274	120	120	8.2	8.2	0.1 L	0.05	0.67	0.67	11.0	11.0	160	160	1.0 L	0.5
MW-15D	1/24/2023	284	284	130	130	9.1	9.1	0.1 L	0.05	0.2 L	0.1	10.0	10.0	10 L	5	1.0 L	0.5
MW-15D	7/19/2023	288	288	130	130	11.0	11.0	0.1 L	0.05	0.81	0.81	11.0	11.0	160	160	1.0 L	0.5
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		0		9		10		9		0	
Minimum conc.			157		110		8.2		0.05		0.10		8.9		5		0.5
Maximum conc.			309		130		11.0		0.05		0.81		11.0		210		0.5
Average conc.			276		124		9.1		0.05		0.64		10.5		157		0.5
Distribution			Neither		Neither		Neither		NC		Neither		Neither		Neither		NC
UCL 95			309*		130*		9.4*		NC		0.82*		11.0*		210*		NC

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-15S																	
MW-15S	1/14/2019	316	316	110	110	13.0	13.0	3.5	3.5	4.1	4.1	5.9	5.9	200	200	1.6	1.6
MW-15S	8/20/2019	376	376	160	160	15.0	15.0	4.1	4.1	0.29	0.29	3.9	3.9	200	200	1.8	1.8
MW-15S	1/21/2020	362	362	110	110	12.0	12.0	3.7	3.7	9.1	9.1	5.6	5.6	200	200	1.4	1.4
MW-15S	8/26/2020	333	333	120	120	15.0	15.0	3.1	3.1	0.37	0.37	10	10	210	210	1.7	1.7
MW-15S	1/19/2021	313	312.5	120	120	15.0	15.0	3.2	3.2	2.7	2.7	8.6	8.6	170	170	2.0	2
MW-15S	8/2/2021	315	315	140	140	15.0	15.0	3.4	3.4	0.2 L	0.1	4.8	4.8	220	220	1.7	1.7
MW-15S	1/18/2022	313	313	140	140	14.0	14.0	3.3	3.3	1.1	1.1	5.7	5.7	180	180	1.8	1.8
MW-15S	8/25/2022	297	297	130	130	12.0	12.0	3.0	3.0	0.2 L	0.1	4.2	4.2	160	160	1.6	1.6
MW-15S	1/24/2023	307	307	140	140	9.0	9.0	2.9	2.9	0.2 L	0.1	3.2	3.2	10 L	5	1.7	1.7
MW-15S	7/19/2023	276	276	130	130	8.3	8.3	3.2	3.2	0.2 L	0.1	7.4	7.4	160	160	1.5	1.5
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		10		6		10		9		10	
Minimum conc.			276		110		8.3		2.9		0.1		3.2		5		1.4
Maximum conc.			376		160		15.0		4.1		9.1		10.0		220		2.0
Average conc.			321		130		12.8		3.3		1.8		5.9		171		1.7
Distribution			Lognormal		Lognormal		Lognormal		Lognormal		Lognormal		Lognormal		Lognormal		Lognormal
UCL 95			338		136		15.5		3.6		13.2		8.6		201		1.9

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-17S																	
MW-17S	1/16/2019	364	364	160	160	12.0	12.0	4.7	4.7	3.2	3.2	2.4	2.4	230	230	1.9	1.9
MW-17S	8/22/2019	457	457	210	210	11.0	11.0	8.9	8.9	0.5	0.5	3.9	3.9	240	240	2.0	2.0
MW-17S	1/21/2020	478	478	170	170	11.0	11.0	6.0	6.0	10.0	10.0	5.4	5.4	270	270	1.7	1.7
MW-17S	8/25/2020	499	499	170	70	14.0	14.0	4.2	4.2	0.9	0.9	7.1	7.1	250	250	1.7	1.7
MW-17S	1/20/2021	571	571	160	160	16.0	16.0	5.3	5.3	24.0	24.0	5.3	5.3	320	320	1.7	1.7
MW-17S	8/2/2021	401	401	180	180	14.0	14.0	4.0	4.0	0.4	0.4	3.5	3.5	220	220	1.6	1.6
MW-17S	1/20/2022	471	471	160	160	15.0	15.0	5.2	5.2	10.0	10.0	5.4	5.4	270	270	1.6	1.6
MW-17S	8/25/2022	401	401	180	180	13.0	13.0	4.8	4.8	0.2 L	0.1	1.7	1.7	150	150	1.9	1.9
MW-17S	1/24/2023	418	418	160	160	12.0	12.0	5.0	5.0	0.2 L	0.1	10.0	10.0	10 L	5	1.8	1.8
MW-17S	7/19/2023	349	349	150	150	11.0	11.0	4.4	4.4	0.5	0.5	9.5	9.5	200	200	1.7	1.7
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		10		8		10		9		10	
Minimum conc.			349		70		11.0		4.0		0.1		1.7		5		1.6
Maximum conc.			571		210		16.0		8.9		24		10.0		320		2.0
Average conc.			441		160		12.9		5.25		5.0		5.4		216		1.8
Distribution			Lognormal		Neither		Lognormal		Lognormal		Lognormal		Lognormal		Lognormal		Lognormal
UCL 95			485		210*		15.6		6.0		24.0*		6.0		267		1.9

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-18D																	
MW-18D	1/15/2019	251	251	98	98	7.3	7.3	0.1 L	0.05	1.7	1.7	7.4	7.4	150	150	1.0 L	0.5
MW-18D	8/21/2019	266	266	110	110	7.0	7	0.1 L	0.05	1.6	1.6	8.0	8.0	170	170	1.0 L	0.5
MW-18D	1/22/2020	250	250	100	100	6.7	6.7	0.1 L	0.05	1.6	1.6	7.8	7.8	160	160	1.0 L	0.5
MW-18D	8/25/2020	320	320	92	92	6.7	6.7	0.1 L	0.05	1.7	1.7	7.9	7.9	160	160	1.0 L	0.5
MW-18D	1/19/2021	254	254	110	110	7.2	7.2	0.1 L	0.05	1.6	1.6	8.1	8.1	150	150	1.0 L	0.5
MW-18D	8/3/2021	251	251	110	110	6.2	6.2	0.1 L	0.05	1.4	1.4	7.3	7.3	160	160	1.0 L	0.5
MW-18D	1/18/2022	263	263	110	110	6.5	6.5	0.1 L	0.05	1.8	1.8	7.4	7.4	160	160	1.0 L	0.5
MW-18D	8/24/2022	251	251	110	110	6.4	6.4	0.11	0.11	1.7	1.7	7.5	7.5	140	140	1.0 L	0.5
MW-18D	1/24/2023	246	246	110	110	6.9	6.9	0.1 L	0.05	1.8	1.8	8.1	8.1	100	100	1.0 L	0.5
MW-18D	7/19/2023	268	268	100	100	8.4	8.4	0.1 L	0.05	1.7	1.7	8.0	8.0	170	170	1.0 L	0.5
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		1		10		10		10		0	
Minimum conc.			246		92		6.2		0.05		1.4		7.3		100		0.5
Maximum conc.			320		110		8.4		0.11		1.8		8.1		170		0.5
Average conc.			262		105		6.9		0.06		1.7		7.8		152		0.5
Distribution			Neither		Neither		Lognormal		NC		Lognormal		Normal		Neither		NC
UCL 95			320*		110*		7.1		NC		1.7		7.8		190*		NC

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-18S																	
MW-18S	1/15/2019	337	337	130	130	14	14	0.1 L	0.5	3.1	3.1	4.7	4.7	200	200	1.3	1.3
MW-18S	8/21/2019	346	346	140	140	12	12	0.1 L	0.5	3.20	3.2	7.5	7.5	220	220	1.2	1.2
MW-18S	1/22/2020	383	383	140	140	18	18	0.1 L	0.5	4.9	4.9	9.7	9.7	230	230	1.2	1.2
MW-18S	8/25/2020	389	389	120	120	12	12	0.1 L	0.5	1.6	1.6	7.9	7.9	200	200	1.1	1.1
MW-18S	1/19/2021	472	472	190	190	16	16	0.1 L	0.5	4.7	4.7	13.0	13.0	260	260	1.3	1.3
MW-18S	8/3/2021	334	334	150	150	12	12	0.1 L	0.5	0.41	0.41	6.4	6.4	200	200	1.1	1.1
MW-18S	1/18/2022	449	449	180	180	17	17	0.1 L	0.5	4.5	4.5	11.0	11.0	260	260	1.4	1.4
MW-18S	8/24/2022	309	309	130	130	11	11	0.1 L	0.5	0.7	0.74	12.0	12.0	180	180	1.0	1
MW-18S	1/24/2023	344	344	180	180	14	14	0.1 L	0.5	4.9	4.9	14.0	14.0	160	160	1.6	1.6
MW-18S	7/19/2023	289	289	99	99	14	14	0.1 L	0.5	2.3	2.3	15	15	160	160	1.2	1.2
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		0		10		10		10		10	
Minimum conc.			289		99		11.0		0.50		0.4		4.7		160		1.0
Maximum conc.			472		190		18.0		0.50		4.9		15.0		260		1.6
Average conc.			365		146		14.0		0.50		3.0		10.1		207		1.2
Distribution			Lognormal		Neither		Lognormal		NC		Lognormal		Lognormal		Lognormal		Lognormal
UCL 95			412		190*		16.0		NC		16.5		11.1		241		1.4

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-20R																	
MW-20R	1/14/2019	100	100	42	42	1.6	1.6	0.1 L	0.05	0.2 L	0.1	2.9	2.9	110	110	1.0 L	0.5
MW-20R	8/21/2019	106	106	47	47	1.6	1.6	0.1 L	0.05	0.2 L	0.1	3.2	3.2	95	95	1.0 L	0.5
MW-20R	1/22/2020	102	102	47	47	1.6	1.6	0.1 L	0.05	0.2 L	0.1	3.1	3.1	93	93	1.0 L	0.5
MW-20R	8/25/2020	228	228	48	48	1.6	1.6	0.1 L	0.05	0.2 L	0.1	3.2	3.2	99	99	1.0 L	0.5
MW-20R	1/21/2021	99	98.9	45	45	1.4	1.4	0.1 L	0.05	0.2 L	0.1	2.5	2.5	110	110	1.0 L	0.5
MW-20R	8/2/2021	98	98	50	50	1.5	1.5	0.1 L	0.05	0.2 L	0.1	2.4	2.4	180	180	1.0 L	0.5
MW-20R	1/18/2022	107	107	46	46	1.5	1.5	0.1 L	0.05	0.2 L	0.1	3.0	3.0	88	88	1.0 L	0.5
MW-20R	8/24/2022	99	99	52	52	1.5	1.5	0.1 L	0.05	0.2 L	0.1	3.4	3.4	68	68	1.0 L	0.5
MW-20R	1/24/2023	100	100	46	46	1.8	1.8	0.1 L	0.05	0.2 L	0.1	3.6	3.6	10 L	5	1.0 L	0.5
MW-20R	7/19/2023	97	97	48	48	1.9	1.9	0.1 L	0.05	0.2 L	0.1	3.4	3.4	77	77	1.0 L	0.5
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		0		0		10		9		0	
Minimum conc.			97		42		1.4		0.05		0.1		2.4		5		0.5
Maximum conc.			228		52		1.9		0.05		0.1		3.6		180		0.5
Average conc.			114		47		1.6		0.05		0.1		3.1		93		0.5
Distribution			Neither		Lognormal		Lognormal		NC		NC		Neither		Neither		NC
UCL 95			228*		48		1.6		NC		NC		3.4*		180*		NC

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-26R																	
MW-26R	1/14/2019	203	203	84	84	4.6	4.6	0.1 L	0.05	0.2 L	0.10	9.5	9.5	150	150	1.0 L	0.5
MW-26R	8/20/2019	200	200	91	91	4.4	4.4	0.1 L	0.05	0.2 L	0.10	8.5	8.5	130	130	1.0 L	0.5
MW-26R	1/23/2020	211	211	94	94	4.6	4.6	0.1	0.14	0.2 L	0.10	10.0	10.0	130	130	1.0 L	0.5
MW-26R	8/25/2020	335	335	87	87	4.7	4.7	0.1 L	0.05	0.2 L	0.10	10.0	10.0	130	130	1.0 L	0.5
MW-26R	1/20/2021	215	215.2	100	100	4.8	4.8	0.1 L	0.05	0.2 L	0.10	11.0	11.0	130	130	1.0 L	0.5
MW-26R	8/2/2021	212	212	100	100	4.6	4.6	0.1 L	0.05	0.2 L	0.10	8.1	8.1	130	130	1.0 L	0.5
MW-26R	1/18/2022	231	231	100	100	4.6	4.6	0.1 L	0.05	0.2 L	0.10	9.9	9.9	140	140	1.0 L	0.5
MW-26R	8/24/2022	210	210	99	99	4.7	4.7	0.1 L	0.05	0.2 L	0.10	9.6	9.6	120	120	1.0 L	0.5
MW-26R	1/24/2023	219	219	100	100	5.3	5.3	0.1 L	0.05	0.2 L	0.10	3.6	3.6	10 L	5	1.0 L	0.5
MW-26R	7/19/2023	213	213	98	98	6.2	6.2	0.1 L	0.05	0.2 L	0.10	12.0	12.0	140	140	1.0 L	0.5
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		1		0		10		9		0	
Minimum conc.			200		84		4.4		0.05		0.10		3.6		5		0.5
Maximum conc.			335		100		6.2		0.14		0.10		12.0		150		0.5
Average conc.			225		95		4.9		0.06		0.10		9.2		121		0.5
Distribution			Neither		Neither		Lognormal		NC		NC		Lognormal		Neither		NC
UCL 95			335*		100*		4.7		NC		NC		10.0		150*		NC

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
FMMW-1																	
FMMW-1	1/15/2019	291	291	100	100	15.0	15	0.1 L	0.05	0.8	0.81	14	14	180	180	1.0 L	0.5
FMMW-1	8/21/2019	290	290	96	96	14.0	14	0.1 L	0.05	1.3	1.3	14.0	14.0	170	170	1.0 L	0.5
FMMW-1	1/21/2020	285	285	110	110	13.0	13	0.1 L	0.05	0.9	0.9	13	13	170	170	1.0 L	0.5
FMMW-1	8/26/2020	382	382	92	92	14.0	14	0.1 L	0.05	1.2	1.2	13	13	190	190	1.0 L	0.5
FMMW-1	1/19/2021	271	271	99	99	12.0	12	0.1 L	0.05	1.80	1.8	13	13	170	170	1.0	1.0
FMMW-1	8/3/2021	282	282	120	120	10.0	10	0.1 L	0.05	0.9	0.89	13	13	61	61	1.0 L	0.5
FMMW-1	1/19/2022	263	263	92	92	9.0	9.0	0.1 L	0.05	1.6	1.6	12	12	150	150	1.0 L	0.5
FMMW-1	8/24/2022	231	231	85	85	9.6	9.6	0.1 L	0.05	1.1	1.1	13	13	130	130	1.0 L	0.5
FMMW-1	1/24/2023	222	222	92	92	9.2	9.2	0.1 L	0.05	1.3	1.3	14	14	140	140	1.8	1.8
FMMW-1	7/18/2023	363	363	130	130	18.0	18	0.1 L	0.05	4.6	4.6	11	11	220	220	1.3	1.3
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		0		10		10		10		3	
Minimum conc.			222		85		9.0		0.05		0.81		11.0		61		0.5
Maximum conc.			382		130		18		0.05		4.6		14		220		1.8
Average conc.			288		102		12.4		0.05		1.6		13.0		158		0.8
Distribution			Neither		Lognormal		Neither		NC		Lognormal		Neither		Neither		NC
UCL 95			382*		105		15.0*		NC		1.9		16*		190*		NC

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Monitoring Well	Date	Specific Conductance		Alkalinity		Chloride		Ammonia		Nitrate		Sulfate		TDS		TOC	
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
FMMW-2																	
FMMW-2	1/15/2019	430	430	95	95	19.0	19.0	0.13	0.13	17.0	17.0	5.2	5.2	290	290	1.4	1.4
FMMW-2	8/21/2019	417	417	140	140	16.0	16.0	0.1 L	0.5	5.3	5.3	6.7	6.7	240	240	1.3	1.3
FMMW-2	1/21/2020	438	438	120	120	20.0	20.0	0.1 L	0.5	13.0	13.0	8.7	8.7	270	270	1.2	1.2
FMMW-2	8/27/2020	374	374	130	130	15.0	15.0	0.1 L	0.5	4.3	4.3	8.0	8.0	240	240	1.3	1.3
FMMW-2	1/19/2021	481	481	150	150	18.0	18.0	0.1 L	0.5	11.0	11.0	21.0	21.0	300	300	1.2	1.2
FMMW-2	8/3/2021	364	364	150	150	15.0	15.0	0.1 L	0.5	2.3	2.3	8.1	8.1	240	240	1.2	1.2
FMMW-2	1/19/2022	443	443	130	130	15.0	15.0	0.1 L	0.5	11.0	11.0	16.0	16.0	280	280	1.1	1.1
FMMW-2	8/24/2022	355	355	150	150	14.0	14.0	0.37	0.37	1.2	1.2	5.8	5.8	200	200	1.3	1.3
FMMW-2	1/24/2023	405	405	130	130	21.0	21.0	0.1 L	0.5	10.0	10.0	8.8	8.8	24	24	7.8	7.8
FMMW-2	7/18/2023	249	249	74	74	23.0	23.0	0.1 L	0.5	1.5	1.5	12.0	12.0	140	140	1.0 L	0.5
No. Analyzed		10		10		10		10		10		10		10		10	
No. Detect		10		10		10		2		10		10		10		9	
Minimum conc.			249		74		14		0.13		1.2		5.2		24		0.5
Maximum conc.			481		150		23		0.50		17.0		21.0		300		7.8
Average conc.			396		127		17.6		0.45		7.7		10.0		222		1.8
Distribution			Lognormal		Normal		Neither		NC		Lognormal		Lognormal		Lognormal		Lognormal
UCL 95			432		140		20*		NC		21.6		13.4		272		1.3

Notes:

Inorganic parameters measured in mg/L

Bold indicates UCL 95 is greater than Cleanup Level.

J indicates analyte was detected below the established reporting limit but above the detection limit

H indicates analyte was analyzed outside of specified holding time

L indicates below the given method reporting limit (MRL).

NC indicates not calculated due to less than 50 percent detection frequency.

MW-14S was dry in August of 2019 and 2020 and therefore was not sampled

* UCL represents maximum concentration detected because the calculated value was greater than the data sample range or the distribution was neither lognormal nor normal.

Statistical calculations use one half the MRL for parameters that were not detected.

Statistical Summary of Groundwater Data - Dissolved Metals
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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-10D					
MW-10D	01/14/19	0.18 L	0.09	0.001 L	0.0005
MW-10D	08/20/19	0.18 L	0.09	0.001 L	0.0005
MW-10D	01/22/20	0.04 L	0.02	0.001 L	0.0005
MW-10D	08/25/20	0.01 L	0.01	0.001 L	0.0005
MW-10D	01/20/21	0.01	0.01	0.001 L	0.0005
MW-10D	08/03/21	0.01 L	0.005	0.001 L	0.0005
MW-10D	01/19/22	0.005 L	0.003	0.001 L	0.0005
MW-10D	08/24/22	0.02 L	0.008	0.002	0.0023
MW-10D	05/10/23	0.02 L	0.008	0.001 L	0.0005
MW-10D	07/19/23	0.02 L	0.008	0.001 L	0.0005
No. Analyzed		10		10	
No. Detect		1		1	
Minimum conc.			0.003		0.0005
Maximum conc.			0.090		0.0023
Average conc.			0.024		0.0007
Distribution			NC		NC
UCL 95			NC		NC
MW-10S					
MW-10S	01/14/19	0.18 L	0.090	0.001 L	0.0005
MW-10S	08/20/19	0.18 L	0.090	0.001 L	0.0005
MW-10S	01/21/20	0.18 L	0.090	0.001 L	0.0005
MW-10S	08/25/20	0.01 L	0.005	0.001 L	0.0005
MW-10S	01/20/21	0.01 L	0.003	0.001 L	0.0005
MW-10S	08/02/21	0.01 L	0.005	0.003	0.0028
MW-10S	01/18/22	0.005 L	0.0025	0.001 L	0.0005
MW-10S	08/24/22	0.02 L	0.008	0.001 L	0.0005
MW-10S	05/10/23	0.02 L	0.008	0.001 L	0.0005
MW-10S	07/19/23	0.02 L	0.008	0.001 L	0.0005
No. Analyzed		10		10	
No. Detect		0		1	
Minimum conc.			0.003		0.0005
Maximum conc.			0.090		0.0028
Average conc.			0.031		0.0007
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-11D(2)					
MW-11D(2)	01/15/19	0.18 L	0.090	0.001 L	0.0005
MW-11D(2)	08/21/19	0.18 L	0.090	0.001 L	0.0005
MW-11D(2)	01/22/20	0.04 L	0.018	0.001 L	0.0005
MW-11D(2)	08/26/20	0.01 L	0.005	0.001 L	0.0005
MW-11D(2)	01/20/21	0.005 L	0.003	0.001 L	0.0005
MW-11D(2)	08/03/21	0.01 L	0.005	0.001 L	0.0005
MW-11D(2)	01/18/22	0.005 L	0.0025	0.001 L	0.0005
MW-11D(2)	08/24/22	0.02 L	0.008	0.001 L	0.0005
MW-11D(2)	01/26/23	0.02 L	0.008	0.001 L	0.0005
MW-11D(2)	07/18/23	0.02 L	0.008	0.001 L	0.0005
No. Analyzed		10		10	
No. Detect		0		0	
Minimum conc.			0.003		0.0005
Maximum conc.			0.090		0.0005
Average conc.			0.024		0.0005
Distribution			NC		NC
UCL 95			NC		NC
MW-11S					
MW-11S	01/15/19	0.18 L	0.090	0.001 L	0.0005
MW-11S	08/21/19	0.18 L	0.090	0.0010 L	0.0005
MW-11S	01/22/20	0.04 L	0.018	0.001 L	0.0005
MW-11S	08/26/20	0.01 L	0.005	0.0011	0.0011
MW-11S	01/19/21	0.005 L	0.003	0.001 L	0.0005
MW-11S	08/03/21	0.01 L	0.005	0.001 L	0.0005
MW-11S	01/18/22	0.005 L	0.0025	0.001 L	0.0005
MW-11S	08/24/22	0.02 L	0.008	0.005	0.005
MW-11S	01/26/23	0.02 L	0.008	0.005	0.005
MW-11S	07/18/23	0.02 L	0.008	0.005	0.005
No. Analyzed		10		10	
No. Detect		0		4	
Minimum conc.			0.003		0.0005
Maximum conc.			0.090		0.0005
Average conc.			0.024		0.0005
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-12D					
MW-12D	01/16/19	0.18 L	0.090	0.001 L	0.0005
MW-12D	08/21/19	0.18 L	0.090	0.001 L	0.0005
MW-12D	01/21/20	0.18 L	0.090	0.001 L	0.0005
MW-12D	08/27/20	0.01 L	0.005	0.001 L	0.0005
MW-12D	01/20/21	0.01 L	0.003	0.001 L	0.0005
MW-12D	08/02/21	0.01 L	0.005	0.001 L	0.0005
MW-12D	01/20/22	0.005 L	0.0025	0.001 L	0.0005
MW-12D	08/25/22	0.02 L	0.008	0.001 L	0.0005
MW-12D	01/25/23	0.02 L	0.008	0.001 L	0.0005
MW-12D	07/19/23	0.02 L	0.008	0.001 L	0.0005
No. Analyzed		10		10	
No. Detect		0		0	
Minimum conc.			0.003		0.0005
Maximum conc.			0.090		0.0005
Average conc.			0.031		0.0005
Distribution			NC		NC
UCL 95			NC		NC
MW-12S					
MW-12S	01/14/19	0.18 L	0.090	0.5	0.5
MW-12S	08/21/19	0.18 L	0.090	0.98	0.98
MW-12S	01/21/20	0.18 L	0.090	0.0089	0.0089
MW-12S	08/27/20	0.01 L	0.005	0.45	0.45
MW-12S	01/20/21	0.01 L	0.003	0.0034	0.0034
MW-12S	08/02/21	0.01 L	0.005	0.34	0.34
MW-12S	01/19/22	0.005 L	0.0025	0.073	0.073
MW-12S	08/25/22	0.02 L	0.008	0.47	0.47
MW-12S	01/25/23	0.02 L	0.008	0.32	0.32
MW-12S	07/19/23	0.02 L	0.008	0.001 L	0.0005
No. Analyzed		10		10	
No. Detect		0		9	
Minimum conc.			0.003		0.001
Maximum conc.			0.090		0.980
Average conc.			0.031		0.315
Distribution			NC		Normal
UCL 95			NC		**0.59**

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-13D					
MW-13D	01/14/19	0.18 L	0.090	0.001 L	0.0005
MW-13D	08/20/19	0.18 L	0.090	0.001 L	0.0005
MW-13D	01/21/20	0.18 L	0.090	0.001 L	0.0005
MW-13D	08/25/20	0.01 L	0.005	0.001 L	0.0005
MW-13D	01/20/21	0.01 L	0.003	0.001 L	0.0005
MW-13D	08/03/21	0.01 L	0.005	0.001 L	0.0005
MW-13D	01/19/22	0.005 L	0.0025	0.001 L	0.0005
MW-13D	08/25/22	0.02 L	0.008	0.001 L	0.0005
MW-13D	01/25/23	0.02 L	0.008	0.001 L	0.0005
MW-13D	07/18/23	0.02 L	0.008	0.001 L	0.0005
No. Analyzed		10		10	
No. Detect		0		0	
Minimum conc.			0.003		0.0005
Maximum conc.			0.090		0.0005
Average conc.			0.031		0.0005
Distribution			NC		NC
UCL 95			NC		NC
MW-13S					
MW-13S	01/14/19	5.80	5.800	0.0010 L	0.0005
MW-13S	08/20/19	0.18 L	0.090	0.0033	0.0033
MW-13S	01/21/20	0.18 L	0.090	0.001 L	0.0005
MW-13S	08/25/20	0.01 L	0.005	0.0017	0.0017
MW-13S	01/20/21	0.01 L	0.003	0.001 L	0.0005
MW-13S	08/03/21	0.01 L	0.005	0.001 L	0.0005
MW-13S	01/19/22	0.005 L	0.0025	0.001 L	0.0005
MW-13S	08/25/22	0.02 L	0.008	0.001 L	0.0005
MW-13S	01/26/23	0.02 L	0.008	0.001 L	0.0005
MW-13S	07/18/23	0.02 L	0.008	0.001 L	0.0005
No. Analyzed		10		10	
No. Detect		1		2	
Minimum conc.			0.003		0.0005
Maximum conc.			5.800		0.003
Average conc.			0.602		0.001
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-14D					
MW-14D	01/14/19	2.50	2.50	1.1	1.1
MW-14D	08/20/19	4.60	4.60	1.4	1.4
MW-14D	01/22/20	0.24	0.24	1.1	1.1
MW-14D	08/26/20	3.59	3.59	1.4	1.4
MW-14D	01/19/21	3.04	3.04	1.0	1.0
MW-14D	08/03/21	4.79	4.79	1.3	1.3
MW-14D	01/18/22	2.10	2.10	1.1	1.1
MW-14D	08/24/22	3.90	3.90	1.3	1.3
MW-14D	05/10/23	4.70	4.70	1.7	1.7
MW-14D	07/18/23	7.90	7.90	2.0	2.0
No. Analyzed		10		10	
No. Detect		10		10	
Minimum conc.			0.240		1.00
Maximum conc.			7.90		2.00
Average conc.			3.74		1.34
Distribution			Normal		Neither
UCL 95			3.7		**1.4***
MW-14S					
MW-14S	01/14/19	0.18 L	0.09	0.19	0.2
MW-14S	01/22/20	0.04 L	0.02	0.017	0.0
MW-14S	01/19/21	0.01 L	0.00	0.04	0.0
MW-14S	08/03/21	0.221	0.221	0.43	0.4
MW-14S	01/18/22	0.005 L	0.00	0.011	0.0
MW-14S	08/24/22	0.038	0.04	0.11	0.1
MW-14S	05/10/23	0.005 L	0.0000	0.35	0.4
MW-14S	07/18/23	0.52	0.52	0.99	0.99
No. Analyzed		8		8	
No. Detect		3		8	
Minimum conc.			0.000		0.011
Maximum conc.			0.520		0.990
Average conc.			0.112		0.267
Distribution			NC		Lognormal
UCL 95			NC		**1.4**

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-14R					
MW-14R	01/14/19	0.18 L	0.09	0.001 L	0.00
MW-14R	08/20/19	0.18 L	0.09	0.19	0.19
MW-14R	01/21/20	0.18 L	0.09	0.180	0.1800
MW-14R	08/25/20	0.05	0.05	0.19	0.19
MW-14R	01/19/21	0.05	0.05	0.2	0.20
MW-14R	08/02/21	0.055	0.06	0.18	0.18
MW-14R	01/18/22	0.053	0.053	0.2	0.20
MW-14R	08/24/22	0.062	0.062	0.19	0.19
MW-14R	05/10/23	0.041	0.041	0.19	0.19
MW-14R	07/18/23	0.047	0.047	0.19	0.19
No. Analyzed		10		10	
No. Detect		7		9	
Minimum conc.			0.041		0.0005
Maximum conc.			0.090		0.20
Average conc.			0.063		0.171
Distribution			Neither		Neither
UCL 95			**0.09***		**0.20***
MW-15D					
MW-15D	01/14/19	0.18 L	0.09	0.026	0.026
MW-15D	08/20/19	0.18 L	0.09	0.026	0.026
MW-15D	01/21/20	0.18 L	0.09	0.028	0.028
MW-15D	08/26/20	0.01 L	0.01	0.018	0.018
MW-15D	01/19/21	0.01 L	0.00	0.031	0.031
MW-15D	08/02/21	0.01 L	0.005	0.0068	0.007
MW-15D	01/18/22	0.005 L	0.0025	0.0027	0.003
MW-15D	08/25/22	0.02 L	0.008	0.0068	0.0068
MW-15D	05/10/23	0.02 L	0.008	0.0023	0.0023
MW-15D	07/19/23	0.015 L	0.0075	0.005	0.0053
No. Analyzed		10		10	
No. Detect		0		10	
Minimum conc.			0.003		0.0023
Maximum conc.			0.090		0.03
Average conc.			0.031		0.015
Distribution			NC		Neither
UCL 95			NC		**0.06***

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-15S					
MW-15S	01/14/19	0.18 L	0.09	1.1	1.10
MW-15S	08/20/19	0.18 L	0.09	1.2	1.20
MW-15S	01/21/20	0.18 L	0.09	1.2	1.2
MW-15S	08/26/20	0.03	0.03	1.2	1.2
MW-15S	01/19/21	0.01 L	0.00	1.1	1.1
MW-15S	08/02/21	0.055	0.055	1.1	1.1
MW-15S	01/18/22	0.005 L	0.0025	1.1	1.1
MW-15S	08/25/22	0.16	0.160	1.1	1.1
MW-15S	05/10/23	0.170	0.1700	1.1	1.1
MW-15S	07/19/23	0.15	0.15	1.1	1.1
No. Analyzed		10		10	
No. Detect		5		10	
Minimum conc.			0.003		1.100
Maximum conc.			0.170		1.20
Average conc.			0.084		1.1
Distribution			NC		Neither
UCL 95			NC		**1.2***
MW-17S					
MW-17S	01/16/19	0.18 L	0.09	0.77	0.77
MW-17S	08/22/19	0.18 L	0.09	1.2	1.20
MW-17S	01/21/20	0.18 L	0.09	1.2	1.20
MW-17S	08/25/20	0.01 L	0.01	0.84	0.8
MW-17S	01/20/21	0.01 L	0.00	1.9	1.9
MW-17S	08/02/21	0.01 L	0.005	0.88	0.88
MW-17S	01/20/22	0.005 L	0.0025	1.5	1.5
MW-17S	08/25/22	0.02 L	0.008	1.4	1.40
MW-17S	05/10/23	0.02 L	0.008	1.2	1.2
MW-17S	07/19/23	0.02 L	0.008	0.84	0.84
No. Analyzed		10		10	
No. Detect		0		10	
Minimum conc.			0.003		0.77
Maximum conc.			0.090		1.9
Average conc.			0.031		1.173
Distribution			NC		Lognormal
UCL 95			NC		1.4

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-18D					
MW-18D	01/15/19	0.18 L	0.09	0.001 L	0.0005
MW-18D	08/21/19	0.41	0.41	0.001 L	0.0005
MW-18D	01/22/20	0.18 L	0.09	0.001 L	0.0005
MW-18D	08/25/20	0.01 L	0.01	0.001 L	0.0005
MW-18D	01/19/21	0.01 L	0.00	0.001 L	0.0005
MW-18D	08/03/21	0.01 L	0.005	0.001 L	0.0005
MW-18D	01/18/22	0.005 L	0.0025	0.001 L	0.0005
MW-18D	08/24/22	0.02 L	0.008	0.001 L	0.0005
MW-18D	01/25/23	0.02 L	0.008	0.001 L	0.0005
MW-18D	07/19/23	0.02 L	0.008	0.001 L	0.0005
No. Analyzed		10		10	
No. Detect		1		0	
Minimum conc.			0.003		0.0005
Maximum conc.			0.410		0.0005
Average conc.			0.063		0.0005
Distribution			NC		NC
UCL 95			NC		NC
MW-18S					
MW-18S	01/15/19	0.18 L	0.09	0.0010 L	0.0005
MW-18S	08/21/19	0.18 L	0.09	0.0010 L	0.0005
MW-18S	01/22/20	0.04 L	0.02	0.0010 L	0.0005
MW-18S	08/25/20	0.01 L	0.01	0.0010 L	0.0005
MW-18S	01/19/21	0.005 L	0.003	0.0010 L	0.0005
MW-18S	08/03/21	0.01	0.013	0.0010 L	0.0005
MW-18S	01/18/22	0.005 L	0.0025	0.0010 L	0.0005
MW-18S	08/24/22	0.015 L	0.008	0.0010 L	0.0005
MW-18S	01/25/23	0.015 L	0.008	0.0010 L	0.0005
MW-18S	07/19/23	0.015 L	0.008	0.0010 L	0.0005
No. Analyzed		10		10	
No. Detect		1		0	
Minimum conc.			0.003		0.0005
Maximum conc.			0.090		0.0005
Average conc.			0.024		0.0005
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-20R					
MW-20R	01/14/19	0.18 L	0.09	0.001 L	0.0005
MW-20R	08/21/19	0.18 L	0.09	0.001 L	0.0005
MW-20R	01/22/20	0.04 L	0.02	0.001 L	0.0005
MW-20R	08/25/20	0.01 L	0.01	0.001 L	0.0005
MW-20R	01/21/21	0.005 L	0.003	0.001 L	0.0005
MW-20R	08/02/21	0.01 L	0.005	0.001 L	0.0005
MW-20R	01/18/22	0.005 L	0.0025	0.001 L	0.0005
MW-20R	08/24/22	0.02 L	0.008	0.001 L	0.0005
MW-20R	05/10/23	0.02 L	0.008	0.001 L	0.0005
MW-20R	07/19/23	0.02 L	0.008	0.001 L	0.0005
No. Analyzed		10		10	
No. Detect		0		0	
Minimum conc.			0.003		0.0005
Maximum conc.			0.090		0.0005
Average conc.			0.024		0.001
Distribution			NC		NC
UCL 95			NC		NC
MW-26R					
MW-26R	01/14/19	0.58	0.58	0.39	0.39
MW-26R	08/20/19	0.67	0.67	0.41	0.41
MW-26R	01/23/20	0.14	0.14	0.42	0.42
MW-26R	08/25/20	0.711	0.71	0.42	0.42
MW-26R	01/20/21	0.753	0.75	0.43	0.43
MW-26R	08/02/21	0.742	0.742	0.44	0.44
MW-26R	01/18/22	0.78	0.780	0.45	0.45
MW-26R	08/24/22	0.82	0.820	0.47	0.47
MW-26R	05/10/23	0.74	0.74	0.46	0.46
MW-26R	07/19/23	0.82	0.82	0.45	0.45
No. Analyzed		10		10	
No. Detect		10		10	
Minimum conc.			0.140		0.39
Maximum conc.			0.820		0.47
Average conc.			0.676		0.434
Distribution			Neither		Lognormal
UCL 95			**0.82***		0.43

Statistical Summary of Groundwater Data - Dissolved Metals
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
FMMW-1					
FMMW-1	01/15/19	0.18 L	0.090	0.001 L	0.0005
FMMW-1	08/21/19	0.18 L	0.090	0.001 L	0.0005
FMMW-1	01/21/20	0.18 L	0.090	0.001 L	0.0005
FMMW-1	08/26/20	0.01 L	0.005	0.001 L	0.0005
FMMW-1	01/19/21	0.01 L	0.003	0.001 L	0.0005
FMMW-1	08/03/21	0.01 L	0.005	0.0011	0.0011
FMMW-1	01/19/22	0.01 L	0.003	0.001 L	0.0005
FMMW-1	08/24/22	0.02	0.023	0.001 L	0.0005
FMMW-1	01/25/23	0.01 L	0.003	0.001 L	0.0005
FMMW-1	07/18/23	0.01 L	0.003	0.036	0.0360
No. Analyzed		10		10	
No. Detect		1		2	
Minimum conc.			0.003		0.0005
Maximum conc.			0.090		0.0360
Average conc.			0.031		0.0041
Distribution			NC		NC
UCL 95			NC		NC
FMMW-2					
FMMW-2	01/15/19	0.18 L	0.09	0.079	0.0790
FMMW-2	08/21/19	0.18 L	0.09	0.011	0.011
FMMW-2	01/21/20	0.18 L	0.09	0.001 L	0.001
FMMW-2	08/27/20	0.01 L	0.01	0.0029	0.003
FMMW-2	01/19/21	0.01 L	0.00	0.001 L	0.0005
FMMW-2	08/03/21	0.01 L	0.005	0.015	0.0150
FMMW-2	01/19/22	0.005 L	0.0025	0.001 L	0.0005
FMMW-2	08/24/22	0.02 L	0.008	0.018	0.018
FMMW-2	01/25/23	0.02 L	0.008	0.038	0.0380
FMMW-2	07/18/23	0.02 L	0.008	0.001 L	0.0005
No. Analyzed		10		10	
No. Detect		0		6	
Minimum conc.			0.003		0.0005
Maximum conc.			0.090		0.0790
Average conc.			0.031		0.017
Distribution			NC		Lognormal
UCL 95			NC		0.25

Notes:

Metals measured in mg/L

MW-14S was dry in August of 2019 and 2020 and therefore was not sampled

Bold indicates UCL 95 is greater than Cleanup Level.

L indicates below the given method reporting limit (MRL).

NC indicates not calculated due to less than 50 percent detection frequency.

* UCL represents maximum concentration detected because the calculated value was greater than the data sample range or the distribution was neither lognormal nor normal.

Statistical calculations use one half the MRL for parameters that were not detected.

Statistical Summary of Groundwater Data - Volatile Organic Compounds
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	1,4-Dichlorobenzene	
		Result	Conc.
MW-11S			
MW-11S	01/15/19	0.5 L	0.25
MW-11S	08/21/19	0.5 L	0.25
MW-11S	01/22/20	0.5 L	0.25
MW-11S	08/26/20	0.5 L	0.25
MW-11S	01/19/21	0.5 L	0.25
MW-11S	08/03/21	0.5 L	0.25
MW-11S	01/18/22	0.5 L	0.25
MW-11S	08/24/22	0.5 L	0.25
MW-11S	01/25/23	0.5 L	0.25
MW-11S	07/18/23	0.5 L	0.25
No. Analyzed		10	
No. Detect		0	
Minimum conc.			0.25
Maximum conc.			0.25
Average conc.			0.25
Distribution			NC
UCL 95			NC

Statistical Summary of Groundwater Data - Volatile Organic Compounds
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	1,4-Dichlorobenzene	
		Result	Conc.
MW-12S			
MW-12S	01/14/19	0.5 L	0.25
MW-12S	08/21/19	0.5 L	0.25
MW-12S	01/21/20	0.5 L	0.25
MW-12S	08/27/20	0.5 L	0.25
MW-12S	01/20/21	0.5 L	0.25
MW-12S	08/02/21	0.5 L	0.25
MW-12S	01/19/22	0.5 L	0.25
MW-12S	08/25/22	0.5 L	0.25
MW-12S	01/25/23	0.5 L	0.25
MW-12S	07/19/23	0.5 L	0.25
No. Analyzed		10	
No. Detect		0	
Minimum conc.			0.25
Maximum conc.			0.25
Average conc.			0.25
Distribution			NC
UCL 95			NC

Statistical Summary of Groundwater Data - Volatile Organic Compounds
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	1,4-Dichlorobenzene	
		Result	Conc.
MW-12D			
MW-12D	01/16/19	0.5 L	0.25
MW-12D	08/21/19	0.5 L	0.25
MW-12D	01/21/20	0.5 L	0.25
MW-12D	08/27/20	0.5 L	0.25
MW-12D	01/20/21	0.5 L	0.25
MW-12D	08/02/21	0.5 L	0.25
MW-12D	01/20/22	0.5 L	0.25
MW-12D	08/25/22	0.5 L	0.25
MW-12D	01/25/23	0.5 L	0.25
MW-12D	07/19/23	0.5 L	0.25
No. Analyzed		10	
No. Detect		0	
Minimum conc.			0.25
Maximum conc.			0.25
Average conc.			0.25
Distribution			NC
UCL 95			NC

Statistical Summary of Groundwater Data - Volatile Organic Compounds
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	1,4-Dichlorobenzene	
		Result	Conc.
MW-13S			
MW-13S	01/14/19	0.5 L	0.25
MW-13S	08/20/19	0.5 L	0.25
MW-13S	01/21/20	0.5 L	0.25
MW-13S	08/25/20	0.5 L	0.25
MW-13S	01/20/21	0.5 L	0.25
MW-13S	08/03/21	0.5 L	0.25
MW-13S	01/19/22	0.5 L	0.25
MW-13S	08/25/22	0.5 L	0.25
MW-13S	01/26/23	0.5 L	0.25
MW-13S	07/18/23	0.5 L	0.25
No. Analyzed		10	
No. Detect		0	
Minimum conc.			0.25
Maximum conc.			0.25
Average conc.			0.25
Distribution			NC
UCL 95			NC

Statistical Summary of Groundwater Data - Volatile Organic Compounds
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	1,4-Dichlorobenzene	
		Result	Conc.
MW-13D			
MW-13D	01/14/19	0.5 L	0.25
MW-13D	08/20/19	0.5 L	0.25
MW-13D	01/21/20	0.5 L	0.25
MW-13D	08/25/20	0.5 L	0.25
MW-13D	01/20/21	0.5 L	0.25
MW-13D	08/03/21	0.5 L	0.25
MW-13D	01/19/22	0.5 L	0.25
MW-13D	08/25/22	0.5 L	0.25
MW-13D	01/25/23	0.5 L	0.25
MW-13D	07/18/23	0.5 L	0.25
No. Analyzed		10	
No. Detect		0	
Minimum conc.			0.25
Maximum conc.			0.25
Average conc.			0.25
Distribution			NC
UCL 95			NC

Statistical Summary of Groundwater Data - Volatile Organic Compounds
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	1,4-Dichlorobenzene	
		Result	Conc.
MW-15S			
MW-15S	01/14/19	0.5 L	0.25
MW-15S	08/20/19	0.5 L	0.25
MW-15S	01/21/20	0.5 L	0.25
MW-15S	08/26/20	0.5 L	0.25
MW-15S	01/19/21	0.5 L	0.25
MW-15S	08/02/21	0.5 L	0.25
MW-15S	01/18/22	0.5 L	0.25
MW-15S	08/25/22	0.5 L	0.25
MW-15S	01/24/23	0.5 L	0.25
MW-15S	07/19/23	0.5 L	0.25
No. Analyzed		10	
No. Detect		0	
Minimum conc.			0.25
Maximum conc.			0.25
Average conc.			0.25
Distribution			NC
UCL 95			NC

Statistical Summary of Groundwater Data - Volatile Organic Compounds
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	1,4-Dichlorobenzene Result	Conc.
MW-17S			
MW-17S	01/16/19	0.5 L	0.25
MW-17S	08/22/19	0.5 L	0.25
MW-17S	01/21/20	0.5 L	0.25
MW-17S	08/25/20	0.5 L	0.25
MW-17S	01/20/21	0.5 L	0.25
MW-17S	08/02/21	0.5 L	0.25
MW-17S	01/20/22	0.5 L	0.25
MW-17S	08/25/22	0.5 L	0.25
MW-17S	01/24/23	0.5 L	0.25
MW-17S	07/19/23	0.5 L	0.25
No. Analyzed		10	
No. Detect		0	
Minimum conc.			0.25
Maximum conc.			0.25
Average conc.			0.25
Distribution			NC
UCL 95			NC

Statistical Summary of Groundwater Data - Volatile Organic Compounds
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	1,4-Dichlorobenzene	
		Result	Conc.
MW-18S			
MW-18S	01/15/19	0.5 L	0.25
MW-18S	08/21/19	0.5 L	0.25
MW-18S	01/22/20	0.5 L	0.25
MW-18S	08/25/20	0.5 L	0.25
MW-18S	01/19/21	0.5 L	0.25
MW-18S	08/03/21	0.5 L	0.25
MW-18S	01/18/22	0.5 L	0.25
MW-18S	08/24/22	0.5 L	0.25
MW-18S	01/25/23	0.5 L	0.25
MW-18S	07/19/23	0.5 L	0.25
No. Analyzed		10	
No. Detect		0	
Minimum conc.			0.25
Maximum conc.			0.25
Average conc.			0.25
Distribution			NC
UCL 95			NC

Statistical Summary of Groundwater Data - Volatile Organic Compounds
2023 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	1,4-Dichlorobenzene Result	Conc.
FMMW-2			
FMMW-2	01/15/19	0.5 L	0.25
FMMW-2	08/21/19	0.5 L	0.25
FMMW-2	01/21/20	0.5 L	0.25
FMMW-2	08/27/20	0.5 L	0.25
FMMW-2	01/19/21	0.5 L	0.25
FMMW-2	08/03/21	0.5 L	0.25
FMMW-2	01/19/22	0.5 L	0.25
FMMW-2	08/24/22	0.5 L	0.25
FMMW-2	01/25/23	0.5 L	0.25
FMMW-2	07/18/23	0.5 L	0.25
No. Analyzed		10	
No. Detect		0	
Minimum conc.			0.25
Maximum conc.			0.25
Average conc.			0.25
Distribution			NC
UCL 95			NC

Notes:

VOCs measured in ug/L

L = below the method reporting limit (MRL)

NC = not calculated due to less than 50 percent detection frequency or historically no detections.

Statistical calculations use one half the MRL for parameters that were non detected.

Appendix H

QUARTERLY SITE INSPECTION REPORTS

Condensate Recirculation Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: Jack Faille

Signature: Jack Faille

Date: 3-23-23

Weather: Cloudy / Rain

Instructions: Inspect each sump for pump operation and measure condensate fluid level, which should be below the overflow drainage pipe. Note any unusual observations such as soil staining or air leaks in the comments section.

Sump	Operation per Design (Y or N)	(1) Depth to Condensate (ft)	(2) Depth to Bottom (ft)	Height of Condensate (ft) = (2) – (1)	Comments
Sump No. 1	Y	–	9.45	0	DRY
Sump No. 2	Y	6.47	8.50	2.03	
Sump No. 3	Y	–	8.89	0	Dry
Sump No. 4	Y	6.46	8.55	2.09	
Sump No. 5	Y	–	6.02	0	Dry
Sump No. 6	Y	7.15	9.15	2.00	
Sump No. 7	Y	–	9.15	0	Dry
Sump No. 8	Y	7.97	9.39	1.42	
Sump No. 9	Y	8.98	9.52	0.54	
Sump No. 10	Y	7.28	9.50	2.22	
Sump No. 11	Y	6.59	9.49	2.90	

Other Remarks:

Hidden Valley Landfill
Landfill Gas Monitoring of On-site Buildings

Date: 3-23-23
Weather Conditions: Rain + Wind
Instrument: MicroFID
Measured By: JTF

The atmosphere inside buildings at the landfill were monitored for possible intrusion of methane gas. Per WAC 173-351, concentrations of methane in on-site structures must not exceed 25% of the lower explosive limit (LEL). If off-site gas migration is suspected, concentrations of methane in off-site structures must not exceed 100 ppm methane.

The areas monitored included:
- The general overall work area
- Floor drains
- Underground conduit protrusions
- Closed areas where landfill gas could collect, such as under cupboards and inside closets

The gas detection instrument must be calibrated using calibration gas containing methane equal to 50 % LEL. Calibration must be performed before and after the survey is completed.

Checked boxes indicate that the survey revealed **no detectable methane**.

- [x] Main Office - individual office spaces, storage areas and within open crawl-space area.
- [x] Repair Shop – survey atmosphere conditions throughout (lower height levels).
- [x] Pay/Scale Booth – interior of building.
- [x] Recycle Building – throughout facility and water drainage areas.
- [x] Leachate Treatment Building – all lower level office spaces, restrooms, water drainage system and storage/equipment areas.
- [x] Gas to Energy Building – central monitoring/control room, engine room and storage cabinets.
- [x] Transfer Station Building – throughout entire building and lower levels.

Signature

Facility Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: Jack Faille Date: 3-23-23

Signature: Jack F. Weather: Wind & Rain

Items	Yes	No	Comments
Cover System			
Settlement Depressions (sinkholes)		X	
Cracking of Cover Soils		X	
Inadequate Cover Soil or Rock		X	
Standing Water		X	
Vegetation			
Bare or Sparsely Vegetated Areas		X	
Areas of Dying Vegetation		X	
Large Root Vegetation (ex. Bushes)		X	
Stormwater Conveyance System			
Ditch Obstructions or Flat Areas		X	
Culvert Obstructions		X	
Catch Basin Debris or Silt Accumulation		X	
Stormwater Basin Debris or Silt		X	
Cover Erosion			
Gullies and/or Erosion Scars		X	
Presence of Seeps		X	
Vector Control			
Evidence of Ground Burrows		X	
Leachate Collection & Leak Detection Systems			
Piping or Valve Issues		X	N/A
Pump or Meter Issues		X	
Foaming at Pump		X	

Other Remarks:

Condensate Recirculation Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: J. Faille

Signature: Jen T. Faille

Date: 5-31-23

Weather: overcast

Instructions: Inspect each sump for pump operation and measure condensate fluid level, which should be below the overflow drainage pipe. Note any unusual observations such as soil staining or air leaks in the comments section.

Sump	Operation per Design (Y or N)	(1) Depth to Condensate (ft)	(2) Depth to Bottom (ft)	Height of Condensate (ft) = (2) – (1)	Comments
Sump No. 1	Y	DRY	9.45'	0	
Sump No. 2	N	6.46'	8.50	2.10	Positive pressure in sump
Sump No. 3	Y	DRY	8.89	0	
Sump No. 4	Y	6.83'	8.75'	1.92	
Sump No. 5	Y	9.04'	9.95'	0.91	
Sump No. 6	Y	7.25'	9.15'	1.90	
Sump No. 7	Y	DRY	9.15'	0	
Sump No. 8	Y	7.79'	9.39'	1.60	
Sump No. 9	Y	9.08'	9.52'	0.44	
Sump No. 10	Y	7.24'	9.55'	2.31	
Sump No. 11	Y	6.63'	9.44'	2.81	

Other Remarks:

Hidden Valley Landfill
Landfill Gas Monitoring of On-site Buildings

Date: 5-31-23
Weather Conditions: overcast, 55°F
Instrument: Micro Fid
Measured By: JTF

The atmosphere inside buildings at the landfill were monitored for possible intrusion of methane gas. Per WAC 173-351, concentrations of methane in on-site structures must not exceed 25% of the lower explosive limit (LEL). If off-site gas migration is suspected, concentrations of methane in off-site structures must not exceed 100 ppm methane.

The areas monitored included:
- The general overall work area
- Floor drains
- Underground conduit protrusions
- Closed areas where landfill gas could collect, such as under cupboards and inside closets

The gas detection instrument must be calibrated using calibration gas containing methane equal to 50 % LEL. Calibration must be performed before and after the survey is completed.

Checked boxes indicate that the survey revealed **no detectable methane**.

- [x] Main Office - individual office spaces, storage areas and within open crawl-space area.
- [x] Repair Shop – survey atmosphere conditions throughout (lower height levels).
- [ ] Pay/Scale Booth – interior of building. 0.3 ppm max
- [x] Recycle Building – throughout facility and water drainage areas.
- [x] Leachate Treatment Building – all lower level office spaces, restrooms, water drainage system and storage/equipment areas.
- [x] Gas to Energy Building – central monitoring/control room, engine room and storage cabinets.
- [x] Transfer Station Building – throughout entire building and lower levels.

Signature

Facility Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: John Faille

Signature: [signature]

Date: 5-31-23

Weather: Overcast

Items	Yes	No	Comments
Cover System			
Settlement Depressions (sinkholes)		X	
Cracking of Cover Soils		X	
Inadequate Cover Soil or Rock		X	
Standing Water		X	
Vegetation			
Bare or Sparsely Vegetated Areas	X		
Areas of Dying Vegetation		X	
Large Root Vegetation (ex. Bushes)		X	
Stormwater Conveyance System			
Ditch Obstructions or Flat Areas		X	
Culvert Obstructions		X	
Catch Basin Debris or Silt Accumulation	X		
Stormwater Basin Debris or Silt	X		
Cover Erosion			
Gullies and/or Erosion Scars		X	
Presence of Seeps		X	
Vector Control			
Evidence of Ground Burrows		X	
Leachate Collection & Leak Detection Systems			
Piping or Valve Issues		X	N/A
Pump or Meter Issues		X	
Foaming at Pump		X	

Other Remarks:

Condensate Recirculation Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: Lucy Walker Date: 7-18-23

Signature: L. Walker Weather: sunny

Instructions: Inspect each sump for pump operation and measure condensate fluid level, which should be below the overflow drainage pipe. Note any unusual observations such as soil staining or air leaks in the comments section.

Sump	Operation per Design (Y or N)	(1) Depth to Condensate (ft)	(2) Depth to Bottom (ft)	Height of Condensate (ft) = (2) – (1)	Comments
Sump No. 1	Y	~~N/A~~ Dry	9.56'	~~9.56~~	
Sump No. 2	Y	6.45'	8.50'	2.05	
Sump No. 3	Y	Dry	8.91	~~8.91~~	
Sump No. 4	Y	6.72'	9.10'	2.38	
Sump No. 5	Y	Dry	9.80'	~~9~~	
Sump No. 6	Y	~~9.15~~ Dry	9.15'		
Sump No. 7	Y	9.2	10.9'	1.7	
Sump No. 8	Y	7.75	9.6'	1.85	
Sump No. 9	Y	9.2	12.5'	3.3	
Sump No. 10	Y	Dry	7.8'	-	
Sump No. 11	Y	6.7	9.55'	2.85	

Other Remarks:

Hidden Valley Landfill
Landfill Gas Monitoring of On-site Buildings

Date: 9-27-23
Weather Conditions: overcast
Instrument: Micro FID
Measured By: JTF

The atmosphere inside buildings at the landfill were monitored for possible intrusion of methane gas. Per WAC 173-351, concentrations of methane in on-site structures must not exceed 25% of the lower explosive limit (LEL). If off-site gas migration is suspected, concentrations of methane in off-site structures must not exceed 100 ppm methane.

The areas monitored included:
- The general overall work area
- Floor drains
- Underground conduit protrusions
- Closed areas where landfill gas could collect, such as under cupboards and inside closets

The gas detection instrument must be calibrated using calibration gas containing methane equal to 50 % LEL. Calibration must be performed before and after the survey is completed.

Checked boxes indicate that the survey revealed **no detectable methane**.

- 1,2 avg* 4,0 max* ☑ Main Office - individual office spaces, storage areas and within open crawl-space area.
- ☑ Repair Shop – survey atmosphere conditions throughout (lower height levels).
- 0 ☑ Pay/Scale Booth – interior of building.
- 0 ☑ Recycle Building – throughout facility and water drainage areas.
- 0 ☑ Leachate Treatment Building – all lower level office spaces, restrooms, water drainage system and storage/equipment areas.
- 0 ☑ Gas to Energy Building – central monitoring/control room, engine room and storage cabinets.
- 0 ☑ Transfer Station Building – throughout entire building and lower levels.

* These readings are suspected to be false positives given while Micro FID "warming up".

Signature

Facility Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: J. Faille

Date: 9-27-23

Signature:

Weather: overcast

Items	Yes	No	Comments
Cover System			
Settlement Depressions (sinkholes)		X	
Cracking of Cover Soils			
Inadequate Cover Soil or Rock			
Standing Water			
Vegetation			
Bare or Sparsely Vegetated Areas		X	
Areas of Dying Vegetation			
Large Root Vegetation (ex. Bushes)			
Stormwater Conveyance System			
Ditch Obstructions or Flat Areas		X	
Culvert Obstructions			
Catch Basin Debris or Silt Accumulation			
Stormwater Basin Debris or Silt			
Cover Erosion			
Gullies and/or Erosion Scars		X	
Presence of Seeps			
Vector Control			
Evidence of Ground Burrows		X	
Leachate Collection & Leak Detection Systems			
Piping or Valve Issues		N/A	
Pump or Meter Issues			
Foaming at Pump			

Other Remarks:

Condensate Recirculation Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: J. Faille

Signature: J. Faille

Date: 11-15-23

Weather: overcast

Instructions: Inspect each sump for pump operation and measure condensate fluid level, which should be below the overflow drainage pipe. Note any unusual observations such as soil staining or air leaks in the comments section.

Sump	Operation per Design (Y or N)	(1) Depth to Condensate (ft)	(2) Depth to Bottom (ft)	Height of Condensate (ft) = (2) – (1)	Comments
Sump No. 1	Yes	9.5	9.5		
Sump No. 2	No	6.42	8.5		Slight + pressure
Sump No. 3	Yes	8.91	8.91		
Sump No. 4	No	8.52	8.60		Slight + pressure
Sump No. 5	No	9.95	9.95		Slight + pressure
Sump No. 6	Yes	7.31	9.15		
Sump No. 7	Yes	9.18	9.25		
Sump No. 8	Yes	7.75	9.39		
Sump No. 9	Yes	9.42	9.51		
Sump No. 10	Yes	7.19	9.60		
Sump No. 11	Yes	6.68	9.45		

Other Remarks: Tip missing to device

Hidden Valley Landfill
Landfill Gas Monitoring of On-site Buildings

Date: 11-15-23
Weather Conditions: overcast
Instrument: Micro FID
Measured By: JTF

The atmosphere inside buildings at the landfill were monitored for possible intrusion of methane gas. Per WAC 173-351, concentrations of methane in on-site structures must not exceed 25% of the lower explosive limit (LEL). If off-site gas migration is suspected, concentrations of methane in off-site structures must not exceed 100 ppm methane.

The areas monitored included:
- The general overall work area
- Floor drains
- Underground conduit protrusions
- Closed areas where landfill gas could collect, such as under cupboards and inside closets

The gas detection instrument must be calibrated using calibration gas containing methane equal to 50 % LEL. Calibration must be performed before and after the survey is completed.

Checked boxes indicate that the survey revealed **no detectable methane**.

- 3.4 ppm ☐ Main Office - individual office spaces, storage areas and within open crawl-space area.
- 2.6 ppm ☐ Repair Shop – survey atmosphere conditions throughout (lower height levels).
- 2.6 ppm ☐ Pay/Scale Booth – interior of building.
- 1.6 ppm ☐ Recycle Building – throughout facility and water drainage areas.
- 1.4 ppm ☐ Leachate Treatment Building – all lower level office spaces, restrooms, water drainage system and storage/equipment areas.
- 1.4 ppm ☐ Gas to Energy Building – central monitoring/control room, engine room and storage cabinets.
- 1.6 ppm ☐ Transfer Station Building – throughout entire building and lower levels.

Max

Signature

Facility Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: J. Faille

Date: 11-15-23

Signature: J. Faille

Weather: overcast

Items	Yes	No	Comments
Cover System			
Settlement Depressions (sinkholes)		X	
Cracking of Cover Soils			
Inadequate Cover Soil or Rock			
Standing Water			
Vegetation			
Bare or Sparsely Vegetated Areas		X	
Areas of Dying Vegetation			
Large Root Vegetation (ex. Bushes)			
Stormwater Conveyance System			
Ditch Obstructions or Flat Areas		X	
Culvert Obstructions		X	
Catch Basin Debris or Silt Accumulation	X		
Stormwater Basin Debris or Silt		X	
Cover Erosion			
Gullies and/or Erosion Scars		X	
Presence of Seeps		X	
Vector Control			
Evidence of Ground Burrows		X	
Leachate Collection & Leak Detection Systems			
Piping or Valve Issues	N/A		
Pump or Meter Issues			
Foaming at Pump			

Other Remarks:

Appendix I

LANDFILL GAS SYSTEM O&M REPORTS

Hidden Valley Landfill
LFG System Monitoring & Maintenance
January 10, 11, 12, 19 2023.

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly extraction well monitoring on January 10th, 11th, 12th, and 19th 2023.
- Replaced 2" LFG hose at N-40 on 1/11/2023
- Replaced damaged 8" LFG Hose at N-3 on 1/19/2023
- Replaced damaged 3" LFG Hose at N-25 on 1/19/2023
- Repaired damaged 2" Line at N-59 on 1/19/2023
- Repaired damaged 4" 45 degree elbow, 4" LFG Hose at E6B on 1/19/2023
- Repaired 3" TEE at well at N-20 on 1/19/2023
- Reconnected 6" Line at N-61 on 1/25/2023

LANDFILL FLARE STATION

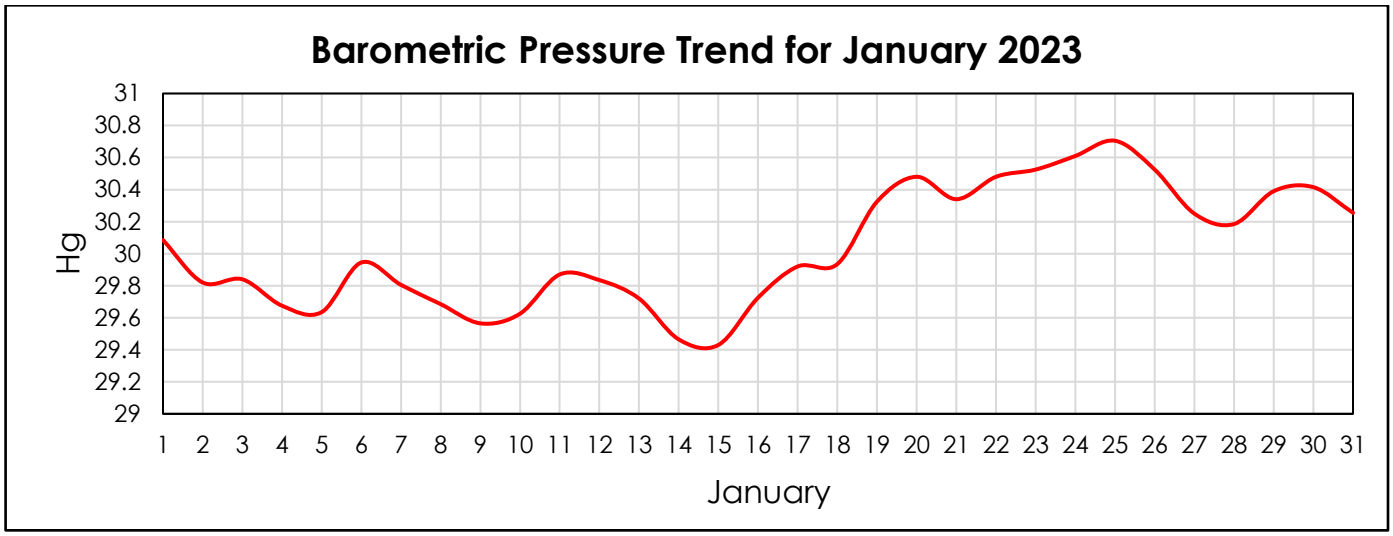
Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
1/11/2023 8:22	27.4	18.3	6.5	47.8	137	137	29.2
1/12/2023 8:23	33.4	22.4	3.2	41	129	129	29.19
1/19/2023 10:10	27.8	18.5	6.3	47.4	107	107	29.67

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
1/10/2023 14:04	35.5	23	3.3	38.2	144	144	28.88
1/11/2023 14:13	32.7	22	3.2	42.1	131	131	29.18
1/12/2023 11:45	32.7	22.1	3.1	42.1	121	121	29.21

Barometric Pressure Trends for January 2023



Data Source: https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-01-20/2023-01-20/monthly

Hidden Valley Landfill
LFG System Monitoring & Maintenance
February 1, 2, 3, 16 2023.

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly extraction well monitoring on February 1st, 2nd, and 3rd 2023.
- Repaired 3" PVC Tee at E-18 Well Head on 2/1/2023
- Temporarily Repaired Oxygen leak at N-25 10" Coupler on 2/2/2023
- Temporarily Repaired Oxygen leak at N-44 6" Coupler on 2/2/2023
- Repaired Blower on 2/16/2023
- Replaced 6" Line at E-41A on 2/16/2023

LANDFILL FLARE STATION

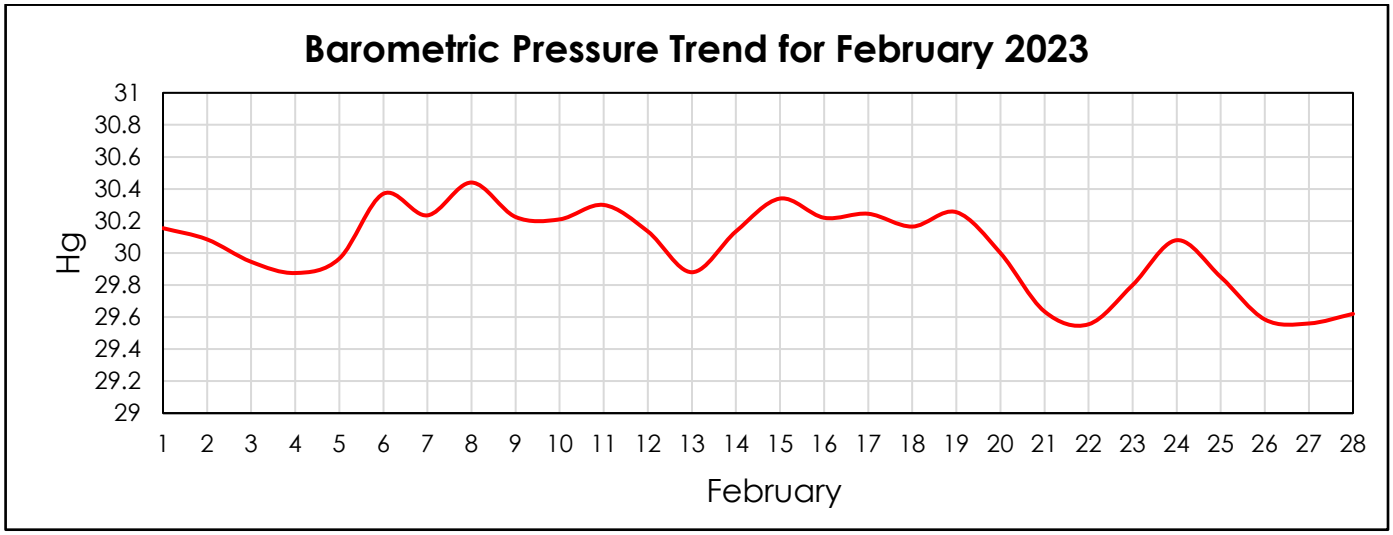
Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
2/1/2023 8:37	27.7	18.1	7.8	46.4	114	114	29.47
2/2/2023 8:03	33.0	21.1	5.3	40.6	132	132	29.45
2/3/2023 11:14	35.8	23.6	3.7	36.9	132	132	29.2

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
2/2/2023 14:22	36.8	23.5	3.0	36.7	134	134	29.47

Barometric Pressure Trends for February 2023



Data Source: https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-02-21/2023-02-21/monthly

Hidden Valley Landfill
LFG System Monitoring & Maintenance
March 2, 3, 7, 8, 22, 29 2023.

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly extraction well monitoring on March 3rd, 7th, 8th 2023.
- Repaired 6" Header at E-41A on 3/2/2023
- Repaired Blower on 3/8/2023
- Repaired 8" Line near E-2B on Header on 3/29/2023

LANDFILL FLARE STATION

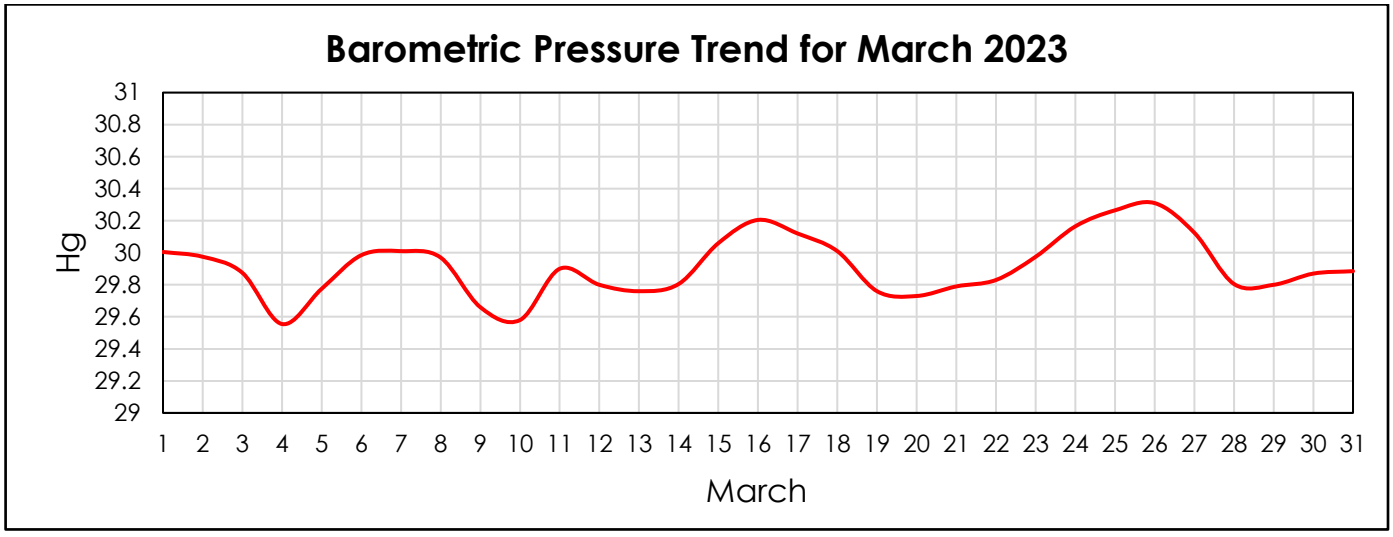
Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
3/3/2023 9:09	34.9	20.1	4.7	40.3	145	145	29.33
3/7/2023 8:08	40.6	21	3.7	34.7	137	137	29.33
3/8/2023 8:42	41.6	20.3	2.5	35.6	175	175	29.26

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
3/8/2023 12:29	42.3	20.1	2.0	35.6	182	182	29.29

Barometric Pressure Trends for March 2023



Data Source: https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-03-21/2023-03-21/monthly

Hidden Valley Landfill
LFG System Monitoring & Maintenance
April 3, 4, 5 2023.

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly extraction well monitoring on April 3rd, 4th, 5th 2023

LANDFILL FLARE STATION

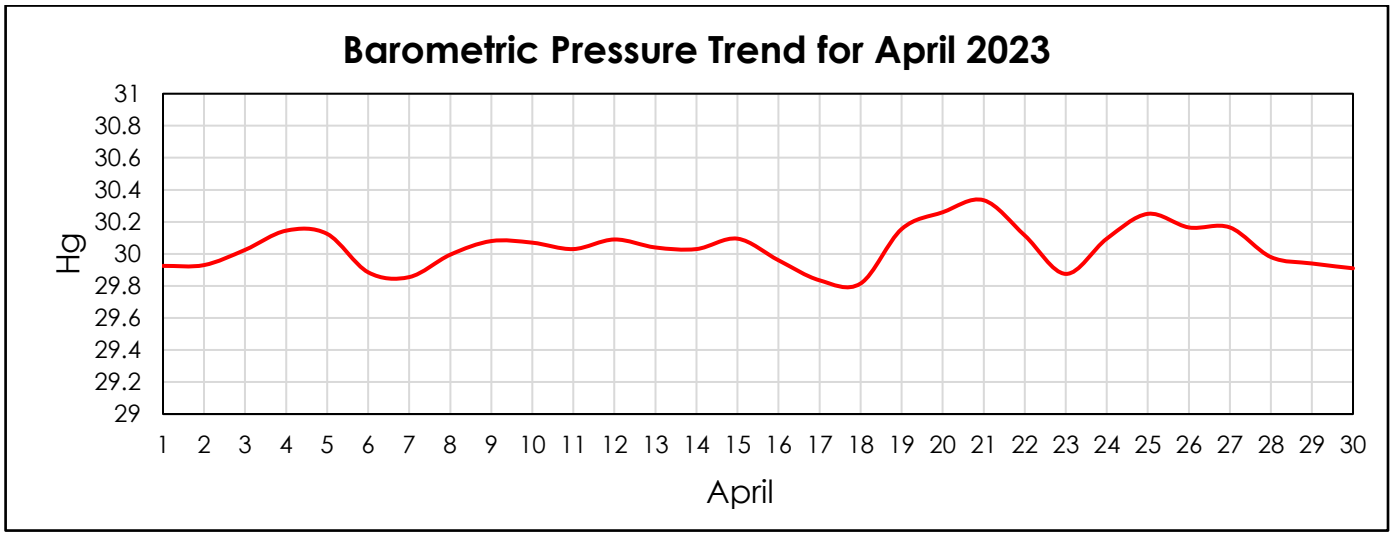
Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
4/4/2023 8:15	40.8	20.9	2.0	36.3	206	206	29.43
4/5/2023 8:36	35.6	22.1	2.5	39.8	202	202	29.50

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
4/3/2023 12:57	37.8	19.7	2.3	40.2	173	173	29.39
4/5/2023 12:44	38.6	23.2	2.4	35.8	163	163	29.49

Barometric Pressure Trends for April 2023



Data Source: https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-04-26/2023-04-26/monthly

Hidden Valley Landfill
LFG System Monitoring & Maintenance
May 9, 10, 11, 30 2023.

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly extraction well monitoring on May 9th, 10th, 11th, 30th 2023

LANDFILL FLARE STATION

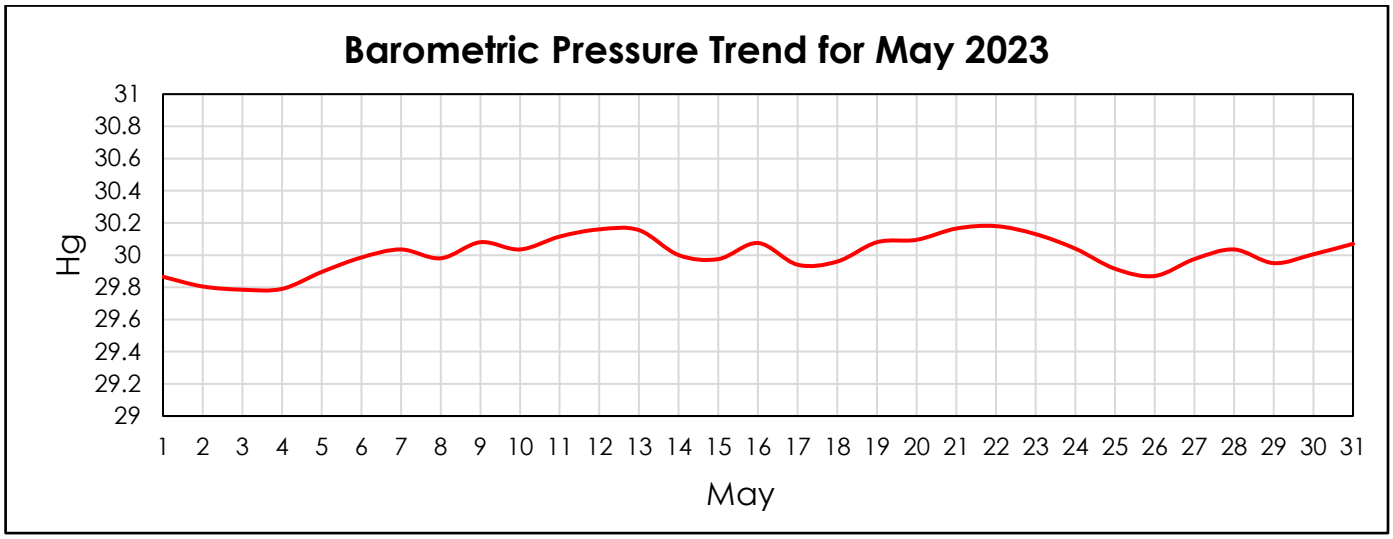
Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
5/9/2023 07:31	37.2	21.5	2.8	38.5	148	148	29.46
5/10/2023 07:29	38.9	20.7	4.2	36.2	148	148	29.40

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
5/10/2023 12:08	39.5	20.8	3.3	36.4	127	127	29.43
5/30/2023 13:09	37.0	19.3	3.3	40.4	125	125	29.42

Barometric Pressure Trends for May 2023



Data Source: https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-05-31/2023-05-31/monthly

Hidden Valley Landfill
LFG System Monitoring & Maintenance
June 7, 8, 19 2023.

MAINTENANCE ITEMS COMPLETED THIS MONTH:

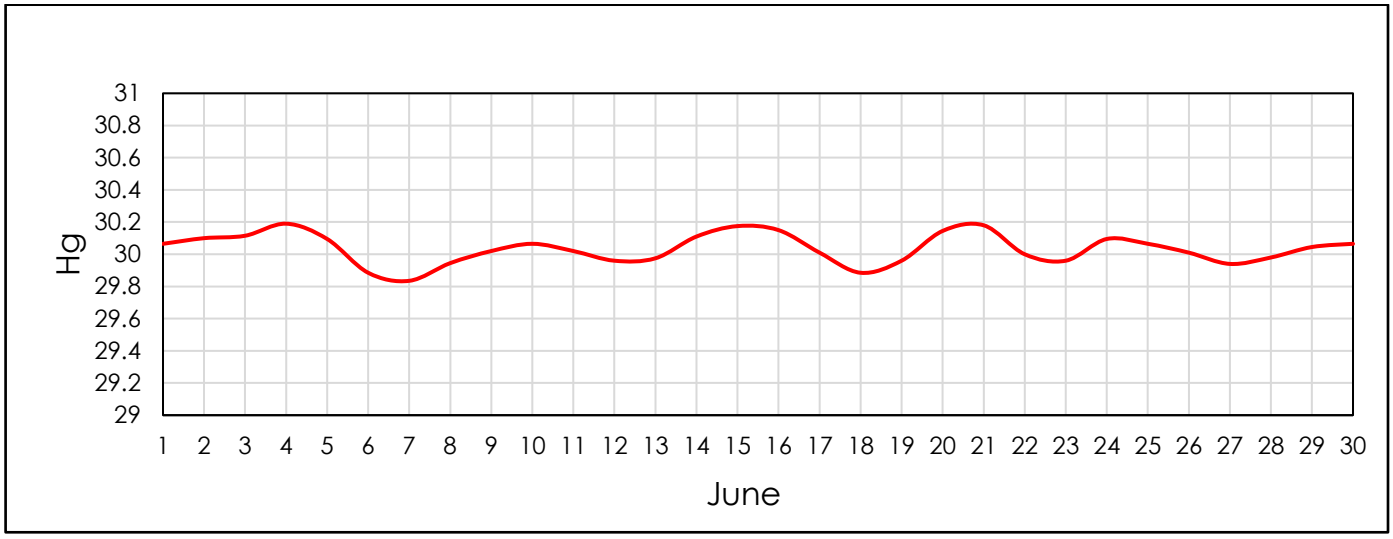
- Performed monthly extraction well monitoring on June 7th, 8th, 19th 2023

LANDFILL FLARE STATION

Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
6/7/2023 07:37	36.0	19.5	3.9	40.6	131	131	29.17
6/8/2023 06:40	31.9	18.3	5.2	44.6	121	121	29.33

Barometric Pressure Trends for June 2023



Data Source: https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-06-31/2023-06-31/monthly

Hidden Valley Landfill
LFG System Monitoring & Maintenance
July 10, 11, 12, 13, 26 2023.

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly extraction well monitoring on July 10th, 12th, 13th, 26th, 2023.
- Swapped out propane bottles at the flare on July 11.

LANDFILL FLARE STATION

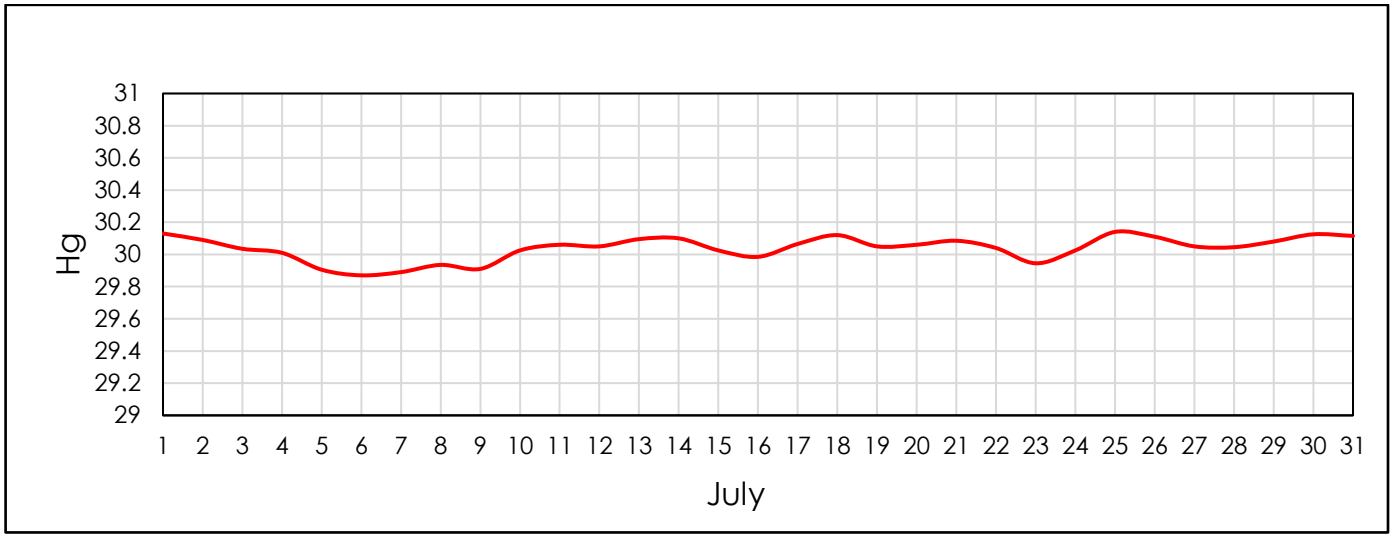
Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
7/13/2023 08:20	39.4	22.0	3.6	35	123	123	29.55

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
7/10/2023 13:35	33.8	21.9	3.9	40.4	182	182	29.51
7/12/2023 15:52	38.5	22.6	2.4	36.5	128	128	29.46

Barometric Pressure Trends for July 2023



Data Source: https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-07-31/2023-07-31/monthly

Hidden Valley Landfill
LFG System Monitoring & Maintenance
August 1, 2, 2023.

MAINTENANCE ITEMS COMPLETED THIS MONTH:

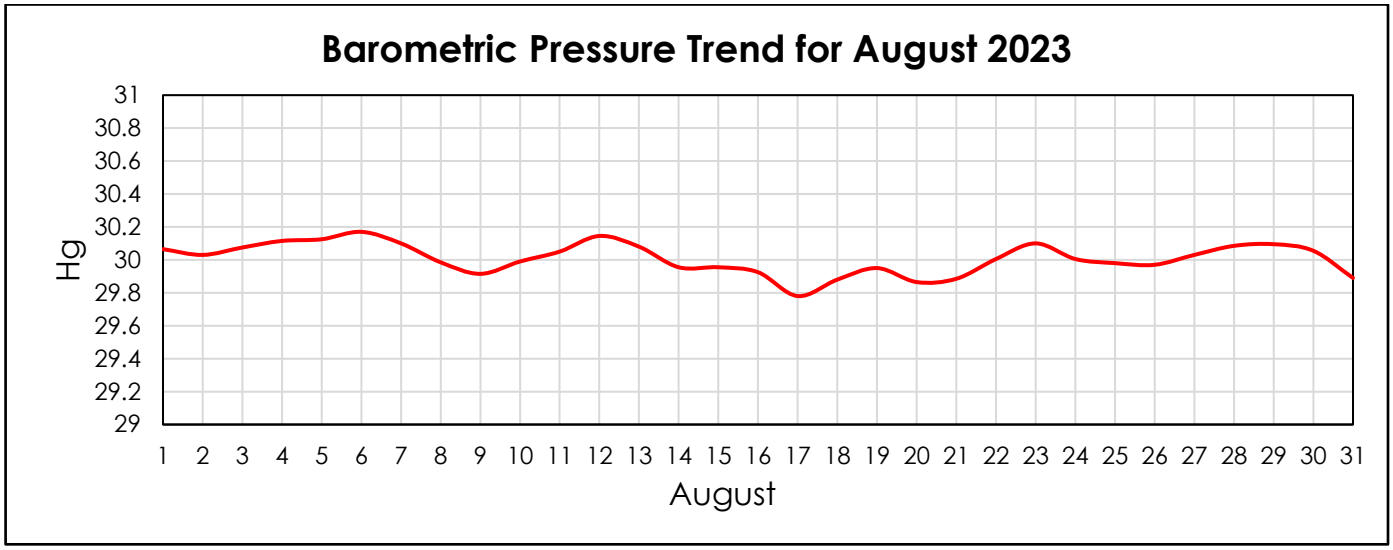
- Performed monthly extraction well monitoring on August 1st and 2nd, 2023.

LANDFILL FLARE STATION

Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
8/1/2023 7:49	32.9	20.8	4.1	42.2	144	144	29.52
8/2/2023 10:59	31.2	19.8	2.2		135	135	29.47

Barometric Pressure Trends for August 2023



Data Source: https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-08-31/2023-08-31/monthly

Hidden Valley Landfill
LFG System Monitoring & Maintenance
September 13, 14, 15, 26, 27, 28, 29, 2023.

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly extraction well monitoring on September 13th, 14th, 15th, 2023.
- Swapped out Nitrogen and Propane bottles at Flare. Solenoid for Propane not operating. Flare not igniting and not able to start Flare on September 27.
- Installed propane solenoid and replaced Flare Spark ignitor. Was able to get Flare to light, but unable to keep Flare operating. Unable to get flare operating on September 27.
- 3" line at N-44 was disconnected, retaped it together temporarily on September 28.
- 6" LFG Hose at N-43 was damaged and taped temporarily on September 28.
- 3" Line at N-25 was disconnected and repaired on September 28.
- Flare ignitor generator grounded out, so wire stripped back was removed, and reconnected. Replaced Fir eye, and confirmed the Flare was operational on September 29.

LANDFILL FLARE STATION

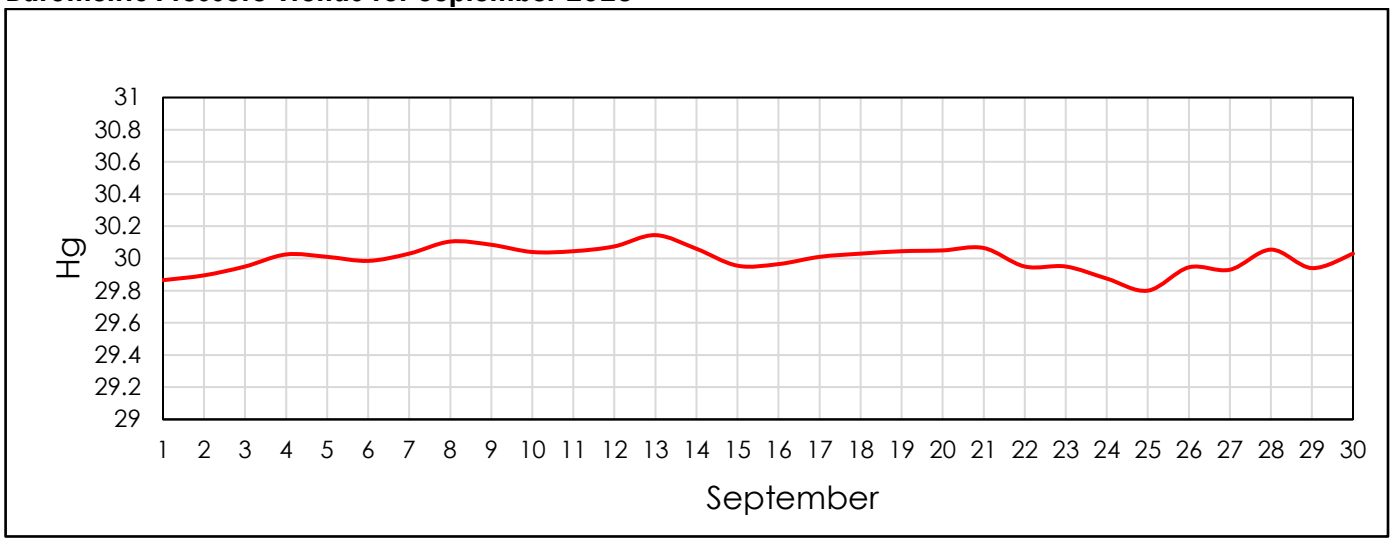
Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
9/15/2023 11:32	44.3	22.8	1.1	31.8	177	177	29.42

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
9/13/2023 14:03	41.8	22	1.8	34.4	154	154	29.57

Barometric Pressure Trends for September 2023



Data Source: https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-09-31/2023-09-31/monthly

Hidden Valley Landfill
LFG System Monitoring & Maintenance
October 2, 3, 4 2023.

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly extraction well monitoring on October 2nd, 3rd and 4th, 2023.
- Replaced damaged 3" LFG Hose at N-25 and N-27 on October 2.
- Replaced 4" LFG Hose at E-10, E-11, N-25 on October 3.
- Replaced damaged 2" Gate Valve at CS-5 and 6" LFG Hose Header on October 3.

LANDFILL FLARE STATION

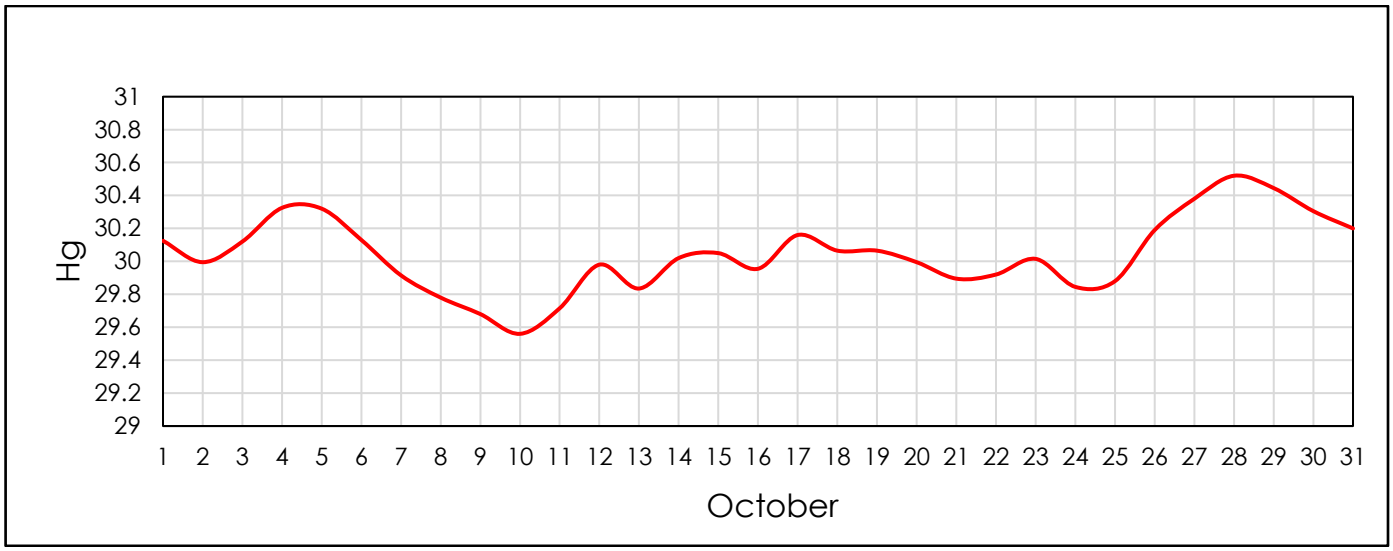
Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
10/3/2023 8:15	47.1	23.9	1.5	27.5	157	157	29.54
10/4/2023 11:05	45.5	23.3	2	29.2	140	140	29.75

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
10/3/2023 16:09	47.6	23.7	1.6	27.1	147	147	29.66

Barometric Pressure Trends for October 2023



Data Source: https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-10-31/2023-10-31/monthly

Hidden Valley Landfill
LFG System Monitoring & Maintenance
November 7, 8 2023.

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly extraction well monitoring on November 7 and 8, 2023.
- Replaced damaged 10" LFG Hose @ E-16 on November 7.
- Replaced 3" LFG Hose at N-27 on November 7.

LANDFILL FLARE STATION

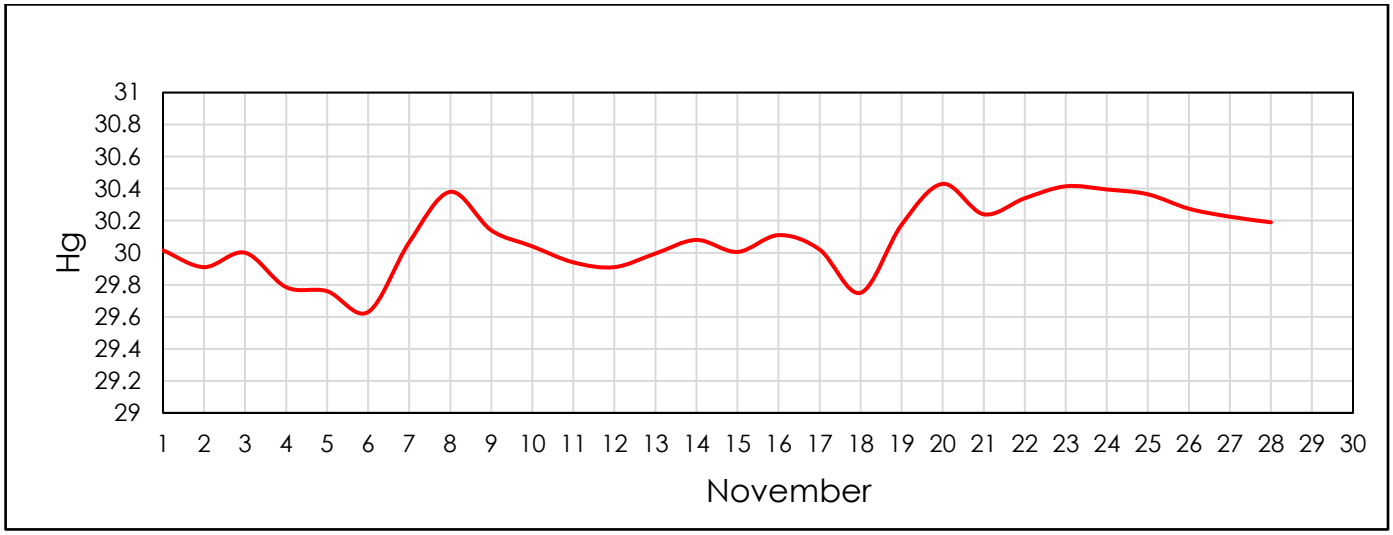
Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
11/7/2023 9:59	41.1	21.6	2.6	34.7	190	190	29.44
11/8/2023 10:23	40.1	21.6	2.8	35.5	116	116	29.85

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
11/7/2023 15:37	37.8	21.2	2.5	38.5	120	120	29.59

Barometric Pressure Trends for November 2023



Data Source: https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-11-31/2023-11-31/monthly

Photo Log

10-inch Header Before Repair

10-inch Header After Repair

Hidden Valley Landfill
LFG System Monitoring & Maintenance
December 6, 7, 2023.

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly extraction well monitoring on December 6th and 7th, 2023.

LANDFILL FLARE STATION

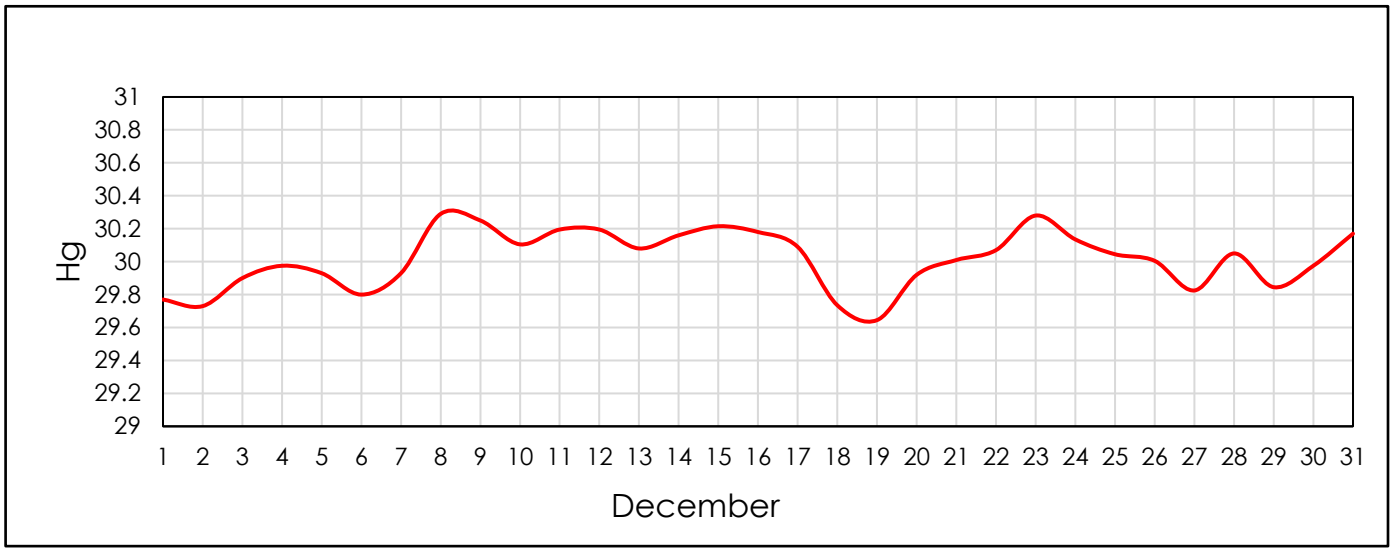
Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
12/7/2023 10:19	44.6	22.4	1.3	31.7	155	155	29.24

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
12/6/2023 14:17	49.7	24.6	21	24.7	152	152	29.11

Barometric Pressure Trends for December 2023



Data Source: https://www.wunderground.com/dashboard/pws/KWASOUTH7/table/2023-12-31/2023-12-31/monthly