FOURTH FIVE-YEAR REVIEW REPORT

Bainbridge Island Landfill

Prepared for: City of Bainbridge Island

Project No. 120097-F • October 31, 2023 Final

Aspect
A Geosyntec Company

earth + water

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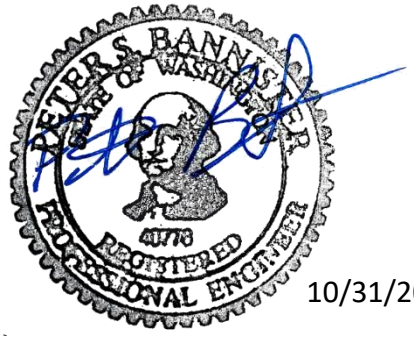
Aspect Consulting, LLC



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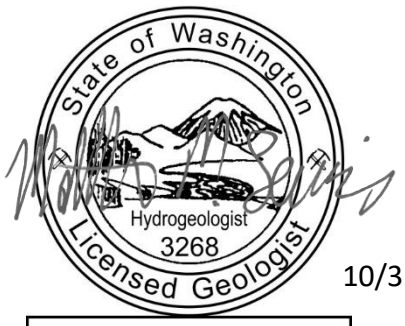

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Contents

Acronyms ..... **iii**

Executive Summary **ES-1**

1 Introduction **1**

2 Summary of Site Conditions **2**

2.1 Physical Setting 2

2.2 Hydrogeology 2

2.3 Site History 3

2.3.1 Landfilling Activities and Investigations 3

2.3.2 Removal Action 4

2.3.3 Post-Removal Conditions 5

2.4 Cleanup Levels 6

2.5 Institutional Controls 6

2.5.1 Future Property Development 6

2.6 Compliance Monitoring 7

2.6.1 Monitoring Locations 7

2.6.2 Monitoring Data Quality Review 7

2.6.3 Groundwater Results and Trends 8

2.6.4 Surface Water Results and Trends 10

3 Periodic Review **12**

3.1 Effectiveness of Completed Remedial Actions 12

3.1.1 Effectiveness for Groundwater 12

3.1.2 Effectiveness for Surface Water 13

3.2 New Scientific Information for COCs 14

3.3 New State and Federal Laws for COCs 14

3.4 Current and Projected Site and Resource Use 15

3.5 Availability and Practicability of More Permanent Remedies 15

3.6 Availability of Improved Analytical Techniques 15

4 Conclusions and Recommendations **16**

4.1 Recommended Sampling Scope Adjustment 16

4.2 Next Periodic Review Report 17

5 References **18**

Limitations **20**

List of Tables

2-1 Monitoring Well Groundwater Elevation Data

2-2 Contaminants of Concern and Proposed Cleanup Levels

2-3 Groundwater Monitoring Results by Monitoring Well

2-4 Surface Water Monitoring Results by Sampling Location

3-1 Summary of Compounds by Well from Semiannual Groundwater Monitoring, 2012–2022

3-2 Summary of Compounds by Well from Annual Surface Water Monitoring, 2012-2022

4-1 Updated Sampling Analytes for Surface Water and Groundwater

List of Figures

1-1 Site Location Map

1-2 Site Plan (Pre-Cleanup Conditions)

1-3 Site Plan (Post-Cleanup Conditions)

2-1 Site Geologic Cross Section Location

2-2 Site Geologic Cross Section B-B’

2-3 Monitoring Well Groundwater Elevation Data

2-4 Off-Site Wells Sampled During RI

Appendices

A Groundwater Potentiometric Surface Maps

B Kitsap County Public Health Letter Summaries of Annual Landfill Inspections

C Compliance Monitoring Field Forms

D Laboratory Reports

E Graphical Presentation of Compliance Monitoring Data

F Beneficial Use Study Update

G Soil Gas Investigation Findings

Acronyms

Aspect	Aspect Consulting, LLC
CAP	Cleanup Action Plan
COCs	Contaminants of Concern
CUL	Cleanup level
Ecology	Washington Department of Ecology
EPA	Environmental Protection Agency
KCHD	Kitsap County Health District
mg/L	milligrams per liter
µg/L	micrograms per liter
MTCA	Model Toxics Control Act
NAVD-88	North American Vertical Datum
NFA	No Further Action
SAP	Sampling Analysis Plan
VOC	volatile organic compound
WAC	Washington Administrative Code
1,1-DCE	1,1-dichloroethene

Executive Summary

The purpose of the five-year review of the Bainbridge Island Landfill Site (Site)—located on a parcel in the middle-west portion of Bainbridge Island, west of Eagle Harbor in Kitsap County, Washington—is to determine if the final removal action in 2001 has been effective in protecting human health and the environment as defined in the Cleanup Action Plan (CAP). The final removal action involved the excavation of solid waste from the former Bainbridge Island Landfill and disposal of that waste at a permitted solid waste facility. This five-year review report is the fourth five-year review report since the completion of the remedial action, and documents compliance monitoring results from 2018 through 2022.

Since the removal action was completed in 2001, concentrations of most contaminants of concern have decreased to less than Site-specific cleanup levels (CULs). Long-term compliance monitoring has demonstrated natural attenuation of volatile organic compounds (VOCs) in groundwater. Concentrations of vinyl chloride were detected above CULs in one downgradient monitoring well (MW-14); however, concentrations in this well continue to trend downward. Manganese continued to increase at two downgradient groundwater monitoring locations during the five-year monitoring period. Reporting limits for dissolved copper concentrations were above the Site-specific CUL for surface water for several sampling events in the reporting period, but data seem to indicate potential landfill impacts in surface water. Groundwater results from the Stetson Acres supply well met state and federal drinking water standards for all events during the monitoring period.

Historical monitoring results indicate that the final removal action will be fully protective of human health and the environment within a reasonable restoration time frame. The CAP indicated that 30 years of monitoring may be required to achieve cleanup objectives.

In response to the rising manganese trends, the City of Bainbridge Island (City) installed soil gas probes/vents across the waste thickness and into the underlying native soils to allow passive venting of observed methane and carbon dioxide. This should help mitigate the geochemical conditions responsible for dissolving naturally occurring manganese in aquifer materials into groundwater. Aspect Consulting, LLC (Aspect), recommends discharging the vented gas through biofilters to reduce greenhouse gas emissions and methane concentrations. The City is currently working with contractors to install these biofilters as soon as practical.

We also recommend that compliance groundwater and surface water monitoring continue until contaminant levels are below CULs. The laboratory should be informed of the CULs, so analysis methods provide reporting limits below the CULs. We recommend that groundwater quality be reviewed to assess performance of the new gas probe/vents and to determine if additional gas probe/vents are warranted.

1 Introduction

On behalf of the City of Bainbridge Island (City), Aspect Consulting, LLC (Aspect), prepared this fourth periodic review report documenting cleanup actions at the Bainbridge Island Landfill Site (Site) since a removal action was conducted in 2001, with a focus on recent actions between January 2018 through December 2022. The Site is located west of Eagle Harbor in the City of Bainbridge Island, Kitsap County, Washington, as shown on Figure 1-1. Figure 1-2 shows the extents of former waste areas at the Site, prior to the 2001 removal action (BJC Group, 2002), relative to the landfill property boundary. Figure 1-3 shows the extent of the final retained materials and soil cover following the 2001 removal action.

Cleanup at this Site is being implemented under Model Toxics Control Act (MTCA) regulations, Chapter 173-340 Washington Administrative Code (WAC). Cleanup activities at the Site were completed under a Consent Decree between Kitsap County (County) and Washington State Department of Ecology (Ecology; Ecology, 2001a), and in accordance with the Cleanup Action Plan (CAP; Ecology, 2001b). The City acquired the Property from the County in 2002, after the removal action.

MTCA regulations (WAC 173-340-420) state Ecology conduct a periodic review of this Site every 5 years because the cleanup action was approved by Ecology under the Consent Decree and institutional controls (access restrictions and restrictive covenants) are required as part of the cleanup. The first, second, and third periodic review reports were provided to Ecology in 2006, 2011, and 2018, respectively (CH2M Hill, 2006; CH2M Hill, 2011; Aspect 2018).

Kitsap County Health District (KCHD) is the local regulatory agency that oversees the operation, closure, and post closure of solid waste landfills in the County. A copy of the five-year review report will be submitted to both Ecology and KCHD for review. A copy of the five-year review report is provided to the County, at their request, based on their past ownership of the landfill. Ecology will publish a notice of this periodic review report for this Site in the Site Register and provide an opportunity for public comment.

Following the third periodic review report, Ecology requested additional cleanup actions, including an investigation into elevated manganese observed at one property-boundary groundwater monitoring well, a beneficial use survey update to evaluate manganese concentrations at nearby public water supply wells, and a soil gas investigation to determine whether landfill gas was present below the remaining waste following the removal action. Results of the manganese investigation were delivered separately (Aspect, 2020). Results of the beneficial use survey update and the soil gas investigation are provided as appendices to this report (Appendices F and G, respectively).

This fourth periodic review report is organized to provide a summary of Site conditions and monitoring results (Section 2), periodic review of the effectiveness of the Site remedy (Section 3), and conclusions and recommendations (Section 4).

2 Summary of Site Conditions

This section provides a summary of the Site conditions. Additional detail is presented with the CAP (Ecology, 2001b) and the First, Second, and Third Five-Year Review Reports (CH2MHill, 2006; CH2MHill, 2011; Aspect, 2018).

2.1 Physical Setting

The Site is located on a parcel in the middle-west portion of Bainbridge Island, west of Eagle Harbor on Bainbridge Island, Washington (see Figure 1-1). The island has a marine climate, including warm, dry summers and cool, wet winters. The average total annual precipitation is approximately 54 inches, of which 85 percent falls between October and April.

Topography varies significantly in the vicinity of the Site. A steep, narrow, east-sloping ravine was reshaped and largely filled in by landfilling activities between 1947 and 1975 (CH2MHill, 2001). The main landfill was located at an elevation of approximately 200 to 270 feet North American Vertical Datum of 1998 (NAVD-88), as shown in Figure 1-3. An unnamed stream flows through a buried surface water diversion pipe across the Site from west to east. The north, southeast, and southwest portions of the Site are covered with second-growth forest and remain relatively undisturbed.

2.2 Hydrogeology

Three aquifers were delineated during the remedial investigation (RI; CH2M HILL, 2000a), the perched aquifer, an upper aquifer, and a lower aquifer. Figure 2-1 shows the transect of one geologic cross section (B-B') from the RI (CH2MHill, 2000a), and Figure 2-2 presents the geologic cross section, which depicts the aquifers, water table, and corresponding geologic descriptions.

The perched aquifer consists of permeable sand and gravel and is underlain by lower-permeability materials. It is located primarily northwest of the Site and is considered hydraulically isolated from the upper aquifer (CH2M HILL, 2000a). The upper aquifer, also referred to as the “Semi-Perched” aquifer (USGS, 2005), consists of saturated glacial advance outwash sand and is locally unconfined. A silt and clay aquitard separates the upper and lower aquifers. The lower aquifer, also referred to as the “Sea Level Aquifer” (USGS, 2005), consists of a saturated sand unit, but is much thinner than the upper aquifer and is confined. The lower aquifer has been described as virtually hydraulically isolated from the upper aquifer (CH2MHill, 2000a) by the 150-foot-thick aquitard. The Sampling and Analysis Plan (SAP) requires only sampling the upper aquifer because the perched aquifer and lower aquifer are hydraulically isolated (CH2M HILL, 2001).

Table 2-1 lists the depths to groundwater and calculated groundwater elevations for the four on-Property groundwater monitoring wells (including upgradient well MW-12 and downgradient wells MW-13, MW-14, and MW-15), which were measured semiannually from June 2018 through December 2022, except December 2018. Depending on location, the depth to groundwater at the Site was between approximately 120 to 150 feet below ground surface (bgs). The remaining waste at the Site is approximately 40 feet thick, so the unsaturated zone between the bottom of waste and the water table is inferred to be 70

to 80 feet thick. Groundwater levels vary up to 7 feet based on long-term cycles and less than 1 foot seasonally as shown on Figure 2-3 that includes time-series graphs of depth to water (top chart) and groundwater elevation (bottom chart). Groundwater elevation contour maps for the upper aquifer are presented in Appendix A, including a contour map showing conditions observed in March 1999 (CH2M Hill, 2000b) for reference. Groundwater flow has been from south to north based on observed conditions, with little variation in groundwater flow direction or gradient over time.

Groundwater is used as a drinking water source by residents living in the vicinity of the Site, as illustrated on Figure 2-4, showing domestic wells monitored during the RI (CH2MHill, 2000b). One off-Site water supply well, the Stetson Acres well (BOW-37), and the four on-Site groundwater monitoring wells were established as Site compliance points in the CAP. All other groundwater monitoring wells and gas probes installed as part of the RI were decommissioned (CH2MHill, 2006).

2.3 Site History

This section provides a historical summary of the Bainbridge Island Landfill based on available records on Ecology's website and previous Site reports. The Site history is subdivided into three periods: landfilling activities and investigations, removal action, and post-removal conditions.

2.3.1 Landfilling Activities and Investigations

- **In 1942,** Kitsap County acquired the property that was later to become the Bainbridge Island Landfill. The property was acquired as part of a tax foreclosure process.

- **In approximately 1946,** the County opened the Bainbridge Island Landfill facility (Facility) at the property to alleviate indiscriminate dumping on the island. The Facility was initially operated and maintained by the County, and refuse was deposited in a ravine that bisected the property. The Facility served the residents of the island, military installations, and the operator of the local refuse collection service.

- **Between 1951 and 1975**, the Facility was operated by the local refuse collection service under a lease from the County. Approximately 7 acres of the Facility were used for disposal in different areas (see Figure 1-2). The main landfill and west-end area accepted primarily domestic refuse and a small amount of commercial waste. As was the practice at the time, some refuse was burned at the Facility until 1968. The five septage pits received liquid-solid sludge from domestic septic system haulers. The largest of the five pits was the south septage pit, located southwest of the main landfill. Trench 3, located just north of the south septage pit, was an excavation in native soil where liquid wood-preserving waste from the Wyckoff Company was disposed until 1973.

- **In 1974,** a neighboring resident brought a lawsuit against the County, which expedited closure of the Bainbridge Island Landfill.

- **Between 1975 and 1978**, Ecology sampled the leachate and surface water to investigate potential contamination.
- **In 1977,** the Bainbridge Island Landfill closure was completed, and a refuse transfer station was opened on the property by Bainbridge Disposal Company. The transfer station continues to operate today on a portion of the property transferred to BDI Vincent Road LLC, according to the County assessor's office.
- **In 1986**, the U.S. Environmental Protection Agency (EPA) conducted a site investigation in which surface and subsurface soil, surface water, and domestic water wells were sampled (Ecology & Environment, 1986). The investigation identified organic contaminants in leachate and surface water, and organic and inorganic contaminants in Trench 3, septage pits, and the main landfill. No evidence of contamination was detected in domestic water wells.
- **Between 1988 and 1994,** the Bremerton-KCHD sampled surface water, leachate, and septage pit sludge from the closed landfill, and collected samples from the domestic wells near the property. The samples from the surface water, leachate, and drinking water wells complied with state primary drinking water standards. Viral assays were negative for sludge samples. The metal content in sludge was similar to typical septage (Ecology, 2001a).
- **In 1990**, Ecology became the lead regulatory agency for Site management.
- **In 1992,** Ecology ranked the Site as a level 1 hazardous waste site under MTCA, based primarily on the disposal of listed wastes from the nearby Wyckoff wood-treatment facility in Trench 3. On a scale of 1 to 5, level 1 sites represent the highest level of risk to human health and the environment.
- **Also in 1992**, the County performed an independent remedial action in Trench 3. Approximately 475 tons of contaminated sludge from Trench 3 was removed, stabilized, and disposed at a hazardous waste landfill. An additional 930 tons of contaminated soil were removed and disposed (Golder & Associates, 1993).
- **In 1996**, the County began the RI and feasibility study (FS) for the cleanup of the landfill under the enforcement order from Ecology. The data and interpretations of the RI are recorded in three documents: the RI report and RI Supplements 1 and 2 (CH2M HILL, 2000a). The FS was completed in May 2000 (CH2M HILL, 2000b).

2.3.2 Removal Action

In 2001, the County implemented the Ecology-selected cleanup action for the Site, including waste reclamation with a soil cover, monitoring, institutional controls, and monitored natural attenuation. The septage pit wastes were excavated and disposed at a permitted facility without screening or sorting. The wastes in the main landfill and west-end area were excavated and sorted by size. Approximately 18,100 tons of waste materials larger than 1.5 inches in diameter were disposed at a permitted facility (CH2MHill, 2006). The remaining fraction (less than 1.5 inches) of waste materials excavated from the main landfill and the west-end area contained mostly soil, gravel, and

ash, with small fragments of metal, glass, and plastic. This material was retained on-Site and capped (CH2MHill, 2006).

An unnamed stream flows through a buried surface water diversion pipe across the Site from west to east. Stormwater drainage originating on the western portion of the Site is directed into the diversion pipe, which conveys water for discharge to the east of the Site (Figure 1-3).

A 2-foot-minimum soil cap was placed on top of the retained material to prevent exposures (direct contact and ingestion), and to allow precipitation infiltration. Infiltration was expected to provide oxygen and other trace nutrients to enhance biodegradation. Erosion protection included revegetation of the soil cap, and placement of erosion mats and large gravel at the center of a constructed drainage channel. As certified in the Landfill Reclamation Report (BJC, 2002), the work was completed in accordance with the CAP.

2.3.3 Post-Removal Conditions

- **In 2002,** the property ownership transferred from the County to the City. The official Quit Claim Deed, dated April 22, 2002, documents the property ownership transfer. Ecology was informed about all stages of the land transfer process (CH2M Hill, 2011).

- **On January 29, 2004,** the slope above surface water monitoring location SWD failed, and approximately 1,500 cubic yards of the retained materials and soil cap slid up to 500 feet down the ravine (CH2M Hill, 2006). To address the slope failure, the City made temporary repairs in 2004, and completed repairs in 2007. In 2008, the slide area was further repaired by armoring the entire slope with large rocks and installing a new drainage pipe to channel water from the landfill (CH2M Hill, 2011). The former slope failure (slide area) and drainage pipe are shown on Figure 1-3. No slope failure has occurred since repairs were completed.

- **In 2005,** the Street and Stormwater Maintenance Materials Decant Facility (Decant Facility) was constructed on the Site. Spoils from roadway shoulders, street cleaning, ditches, and catch basins from maintenance activities have been brought to the Decant Facility for dewatering. The solid-portion spoils are hauled to a permitted landfill for disposal. The surface water treatment system includes an oil -water separator, a sand filter, a bioswale, and a settling pond. Since 2017, the City has collected liquids from the decant facility for treatment at the City's wastewater treatment plant.

2.4 Cleanup Levels

Table 2-2 summarizes the contaminants of concern (COCs) and cleanup levels (CULs) for groundwater and surface water presented in the CAP (Ecology, 2001a). The Sampling and Analysis Plan (SAP) included a modified list of COCs and CULs (CH2M Hill, 2001). Minor adjustments in CULs for vinyl chloride in groundwater and dissolved copper in surface water were proposed in the first and second periodic review reports (CH2M Hill, 2006; CH2M Hill, 2011), based on new state and federal laws for COCs. For the purposes of this report, both the original and proposed CULs are referenced.

Groundwater CULs were determined for protection of groundwater as drinking water, and discharge to surface water. The COCs with CULs for groundwater include vinyl chloride, 1,1-dichloroethene (1,1-DCE), manganese (total and dissolved fractions), nitrate, sulfate, chloride, conductivity, and pH. Groundwater samples have also historically been collected for laboratory analysis of alkalinity (including total alkalinity, bicarbonate, and hydroxide).

Surface water CULs were determined for the protection of freshwater aquatic organisms. The COCs with CULs for surface water include copper (dissolved fraction), iron (total and dissolved fractions), zinc (dissolved fraction), and lead (dissolved fraction). Surface water samples have also historically been collected for laboratory analysis of carbonate alkalinity, coliforms (total and fecal), and *E. coli*.

2.5 Institutional Controls

Institutional controls include access restrictions and restrictive covenants to prevent exposure to retained materials on the Site.

Vehicular access to the Site is limited by a gate at the entrance off Vincent Road. The boundary of the active transfer station is fenced, and signage is posted, to prevent trespassing to other portions of the Site.

The restrictive covenants text is included in the Consent Decree (Ecology, 2001a), and elements of the restrictive covenants for the Site include:

1) Prohibition of the beneficial use or withdrawal of Site groundwater,
2) Prohibition on installing wells other than those required under the CAP, and
3) Prohibition on activities that would damage the integrity of the soil cover placed over the inert waste material.

The City conducts visual inspections of the Site, access restrictions, cover system, and monitoring network during sampling events (at a minimum). The City periodically mows the vegetated cover and removes brush, as needed, for safe access to sampling locations. KCHD conducts annual inspections of the former Bainbridge Island Landfill, as summarized in the letters provided as Appendix B.

2.5.1 Future Property Development

The City is not currently considering any development opportunities at the Site.

2.6 Compliance Monitoring

This section includes discussions of monitoring locations, data quality review, and monitoring results.

2.6.1 Monitoring Locations

The groundwater monitoring network consists of four on-Site monitoring wells[1] (one upgradient well MW-12 and three downgradient wells MW-13, MW-14, and MW-15) and one off-Site domestic water well (the Stetson Acres well [BOW-37]). All groundwater monitoring locations are shown on Figure 1-3. Monitoring well MW-12 is upgradient of the contained materials and provides background concentrations for comparison with results from downgradient wells. In accordance with the CAP (Ecology, 2001a), the upper aquifer groundwater monitoring wells have been sampled semiannually, during dry-season and wet-season conditions (typically June and December), by City personnel.

Surface water has been monitored at two locations on the Site. The upstream station is near the western property boundary and the downstream location is on the eastern property boundary, downstream of the Decant Facility settling pond outlet structure (Figure 1-3). The sampling stations were not disturbed by the 2001 remedial actions, as a result of post-closure construction, or by the slope failures and repairs of 2004, 2007, and 2008. Both surface water stations have been sampled once per year in conjunction with the wet-season groundwater monitoring event (typically December).

2.6.2 Monitoring Data Quality Review

Laboratory results and field parameter measurements were found to be usable for assessment of the Site cleanup effectiveness, based on a review of data quality and validity—with exceptions noted below.

Water samples were collected under chain-of-custody procedures and transported for laboratory analysis by Pace Analytical (in June 2018) and Freemont Analytical, Inc., of Seattle, Washington. Laboratory results were provided in standard report format. Field parameters were measured using calibrated field sensors and recorded manually on sampling sheets.

For this report, the City provided the following data:

- Laboratory results[2] and field parameters[3] for ten groundwater sampling events from June 2018 through December 2022. In addition, Aspect performed three additional sampling events for select constituents in May, July, and August 2020 as part of the focused manganese investigation (Aspect, 2020).
- Laboratory results and field parameters for surface water sampling events from December 2018 through December 2022.

[1] Other on-Site groundwater monitoring wells (and soil gas probes) installed during the RI were decommissioned in 2001 in accordance with resource well regulations (Chapter 173-160 WAC).
[2] Sampling was not performed in December 2022 at BOW-37 due to on-site construction.
[3] Field parameter records for groundwater sampling were not available for the December 2018 sampling event.

Data quality was evaluated as part of the monitoring and review process. Some laboratory results were qualified by the laboratory as "estimated between the practical quantitation limit and the method detection limit" (J-flagged), and/or "below the test detection limit" (U-flagged). No samples or results were rejected by the laboratory. Data quality evaluation confirmed that during four sampling events, volatile organic compounds (VOCs) were analyzed using methods with detection limits above the cleanup levels, due to miscommunications between the City and the laboratory. This occurred during the sampling events conducted on December 2020, December 2021, June 2022, and December 2022. The City will add specific language to the standardized chain-of-custody paperwork to avoid this miscommunication going forward.

Field parameter data should be interpreted cautiously. During several monitoring events, recorded measurements were outside the normal range of values. The cause of out-of-range field parameters could have been due to inconsistent instrument operation or setup, transposition while recording values, or inconsistent units. Laboratory results were not influenced by field parameter measurements. See Section 4 regarding future monitoring of field parameters.

2.6.3 Groundwater Results and Trends

Groundwater quality data from June 2018 through December 2022 are discussed below, first by compliance point location, then in the context of detected COC concentrations over time. Groundwater results from 2012 to 2022 are presented in Table 2-3, and time-series plots are available in Appendix E with monitoring wells labeled with the aliases of BMW-XX, such as MW-12 is listed as BMW-12.

Monitoring well MW-12 is located upgradient of the contaminant source, as shown on Figures 1-2 and 1-3. All groundwater results from June 2018 through December 2022 were below CULs except for VOCs, which were all nondetect. These VOC values are the result of laboratory reporting limits above CULs due to the use of incorrect analysis methods; however, subsequent results remained below CULs. These results are consistent with the previous periodic review reports (CH2MHill, 2006, 2011, and Aspect 2018).

Results from MW-12 provide background conditions for comparison with observations at downgradient monitoring locations. Background groundwater conditions include elevated dissolved oxygen (greater than 10 milligrams per liter [mg/L]), relatively low alkalinity, no detected total or dissolved manganese (except one instance in May 2020 of 0.0023 mg/L), and no detected VOCs.

Monitoring well MW-13 is the easternmost on-Site compliance point downgradient of contained materials, as shown on Figures 1-2 and 1-3. During all monitoring events, vinyl chloride and 1,1-DCE were not detected, and chloride, nitrate, and sulfate were reported at concentrations less than the respective CULs. Low dissolved oxygen (less than 2 mg/L), relatively high alkalinity, and high manganese concentrations (greater than the 0.5 mg/L CUL) at MW-13 may indicate landfill influence.

Monitoring well MW-14 is the central on-Site compliance point downgradient of contained materials, as shown on Figures 1-2 and 1-3. Vinyl chloride was detected, or had detection limits, above the 0.023 μg/L CUL in every sampling event but one, where it was not detected (June 2018). During all monitoring events, 1,1-DCE, chloride, nitrate,

sulfate, and manganese (dissolved and total fractions) were reported at concentrations less than the respective CULs, except in the case of 1,1-DCE where the detection limit was above the CUL. Low dissolved oxygen (less than 2 mg/L), relatively high alkalinity, and increasing manganese concentrations (which exceeded the CUL of 0.05 mg/L four times) at MW-14 may indicate the effects of contained materials.

Monitoring well MW-15 is the westernmost on-Site compliance point downgradient of contained materials, as shown Figures 1-2 and 1-3. All concentrations of COCs in groundwater during the 2018 through 2022 monitoring period were below CULs, except in cases where the reporting limits were above CULs. Compared to background, dissolved oxygen was lower, alkalinity was elevated, there was little to no detected manganese, and no detected VOCs.

Observation well BOW-37 (Stetson Acres well) is located approximately 800 feet downgradient of the northwest corner of the Site and is the farthest downgradient compliance point as shown on Figures 1-2 and 1-3. Results from compliance point BOW-37 met state and federal drinking water standards for all events during the monitoring period. State and federal drinking water standards, also called maximum contaminant levels (MCLs), were equal to the Site CULs, except for vinyl chloride, which has a MCL of 2 micrograms per liter (µg/L), and 1,1-DCE, which has a MCL of 7 µg/L. Vinyl chloride concentrations were below the MCL of 2 µg/L during all sampling events, and below the CUL of 0.023 µg/L in all events where the reporting limits were below the CUL. During all monitoring events, 1,1-DCE, chloride, nitrate, sulfate, and manganese (dissolved and total fractions) were reported at concentrations less than the respective CULs and MCLs.

Vinyl chloride concentrations in groundwater were not detected at any monitoring well over the sampling period, except MW-14, as shown on Figure E-1. While vinyl chloride concentrations at MW-14 are above CULs, they have shown a general downward trend since December 2014. Since reporting limits were above CULs for four sampling events, as discussed above, compliance cannot be demonstrated for vinyl chloride. However, there is no evidence implying significant changes in groundwater trends at those times.

Chloride concentrations in groundwater were below the CUL of 250 mg/L for the reporting period, as shown on Figure E-2 presenting a time-series plot from 2012 through 2022 at groundwater compliance wells. However, there seems to be a slight increasing trend at MW-15, though concentrations are still well below CULs.

Nitrate concentrations in groundwater were below the CUL of 10 mg/L as nitrogen, as shown on Figure E-3 presenting a time-series plot from 2012 through 2022 at groundwater compliance wells. However, there seems to be a slight increasing trend at MW-15, though concentrations are still well below CULs.

Manganese concentrations were stable (MW-12 and MW-13) or increasing (MW-14 and MW-15), based on groundwater sampling results. The time-series plots on Figure E-4 and E-5 show total and dissolved manganese concentrations from 2012 through 2022 for all groundwater compliance wells. Total and dissolved manganese were above CULs for the full reporting period at MW-15, and for three and two sampling events at MW-14,

respectively. In addition, 5-year averages for manganese concentrations show compliance in all wells, but MW-15; however, MW-14 continues to show an increasing trend.

1,1-DCE concentrations in groundwater were below the CUL of 0.073 mg/L, as shown on Figure E-6 presenting a time-series plot from 2012 through 2022 at groundwater compliance wells. Since reporting limits were above CULs for four sampling events, as discussed above, compliance cannot be demonstrated for 1,1-DCE. However, there is no evidence implying significant changes in groundwater trends at those times.

2.6.4 Surface Water Results and Trends

Surface water data from December 2018 through December 2022 are discussed in this section, first by compliance point location, then in the context of detected COC concentrations over time. Table 2-4 presents surface water field parameters and laboratory results for SW-1U and SW-4D, and Appendix E presents the time-series plots of COCs.

Upstream surface water location SWU is located on the west end of the Site, as shown on Figures 1-2 and 1-3. Total iron results did not exceed the CUL of 1.0 mg/L during the reporting period.

During one of five sampling events (December 2018), dissolved copper was detected below the CUL of 0.0018 mg/L; however, all other sampling results during the reporting period had a reporting limit of 0.002 mg/L except December 2020, which had an estimated reporting limit of 0.00406 mg/L. Total copper was not detected above the reporting limit of 0.002 mg/L for the reporting period, but was not analyzed for during the December 2018 and 2022 events.

Total and dissolved zinc were detected below CULs of 0.021 mg/L for all sampling events in the reporting period.

Downstream surface water location SWD is located on the eastern Site boundary, as shown on Figures 1-2 and 1-3. During one of five sampling events, total iron concentrations exceeded the CUL of 1.0 mg/L, but dissolved iron concentrations were below the CUL for the full reporting period.

Total and dissolved copper concentrations were detected above the CUL of 0.0018 mg/L for all sampling events except December 2021, when it was not detected above the reporting limit of 0.002 mg/L.

During all monitoring events, total and dissolved zinc were reported at concentrations below their 0.0021 mg/L CULs.

Total iron concentrations in surface water appeared relatively stable during the reporting period, except for one anomalously high value in December 2018, before concentrations returned to the previous trend. Figure E-7 presents a time-series plot of total iron concentrations from 2012 through 2022 at surface water compliance locations. Recent concentrations at SWD are much improved compared to concentrations of greater than 10 mg/L observed in 2004 and 2005, and appear to be trending toward compliance.

Dissolved iron concentrations in surface water were below the CUL of 1.0 mg/L, as shown on Figure E-8 presenting a time-series plot of dissolved iron concentrations from 2012 through 2022 at surface monitoring points.

Dissolved copper concentrations in surface water were detected at concentrations above the 1.8 mg/L CUL for all sampling events in the reporting period except December 2021, when the reporting limit was above the CUL. Figure E-9 presents a time-series plot of dissolved copper concentrations from 2012 through 2022 at groundwater compliance wells.

3 Periodic Review

Based on WAC 173-340-420(4), when evaluating whether human health and the environment are being protected at this Site, the periodic review criteria include:

a) The effectiveness of the 2001 removal action, including the effectiveness of engineered controls and institutional controls in limiting exposure to hazardous substances remaining at the Site.

b) New scientific information for individual hazardous substances present at the Site.

c) New applicable state and federal laws for individual hazardous substances present at the Site.

d) Current and projected Site and resource use.

e) Availability and practicability of more permanent remedies.

f) The availability of improved analytical techniques to evaluate compliance with CULs.

3.1 Effectiveness of Completed Remedial Actions

Based on Site inspections by the City and KCHD, the institutional controls and soil cover continue to eliminate the exposure pathways (direct contact and ingestion) of retained materials. No repairs or alterations to the fencing or soil cover were necessary for the monitoring period from 2018 through 2022. Inspection letters are included in Appendix B.

3.1.1 Effectiveness for Groundwater

Table 3-1 presents a statistical summary of the analytical data by well, showing the frequency of detections, minimum and maximum values detected, and the number of CUL exceedances from 2018 through 2022. Exceedances discussed throughout this report were determined based on the 2001 CULs. To help determine if a monitoring well or surface water monitoring location is compliant with CULs, average concentrations for the last 5 years were also calculated for each constituent at each well, using half of the reporting limit where none were detected. Table 3-1 includes CULs from the 2001 CAP and Consent Decree, proposed CULs from 2011, and most-stringent MTCA Method B values.

During the 2018 to 2022 reporting period, all groundwater COCs remained below CULs, except for vinyl chloride, and total and dissolved manganese. Vinyl chloride concentrations have been decreasing in all wells since 2001 and were not detected above CULs at any wells, except MW-14, during the reporting period. However, 5-year average concentrations at the compliant wells were calculated above the CUL, due to high reporting limits associated with incorrect analysis methods (as discussed in Section 2.6.2). Concentrations of 1,1-DCE in groundwater at all compliance points were not detected above the CUL and the 5-year average concentration is below the CUL. This

suggests the removal action was effective for VOCs in groundwater, and the Site is compliant regarding 1,1-DCE.

Concentrations of manganese (total and dissolved) in groundwater at MW-13, and recently at MW-14, have been above CULs and show an increasing trend. These trends, along with changes in pH and alkalinity, indicate that groundwater quality is influenced by geochemical conditions related to landfill gas generated from ongoing decomposition of materials retained following the 2001 removal action.

The City actively addressed rising manganese trends by investigating well conditions and geochemistry (Aspect, 2020). Recommendations from the manganese investigation included conducting a soil gas survey to assess the concentrations of methane and carbon dioxide that could influence groundwater geochemistry. In August, 2023, the City installed gas probe/vents within the retained waste area to serve as soil gas probes for data collection. The soil gas vent installation and the results of the soil gas survey are detailed in Appendix G. In summary, landfill gas was found between the bottom of waste and groundwater at concentrations that likely influence geochemical conditions and groundwater quality. Recommendations from this finding include allowing passive venting, installing biofilters to reduce greenhouse gas emissions, and reviewing long-term groundwater quality to determine if additional vents are warranted.

The passive venting process takes advantage of variations in barometric pressure. First, landfill gas is "exhaled" and vented during decreasing barometric pressure, thereby preventing accumulation of landfill gas in the subsurface and decreasing the geochemical conditions that dissolve manganese. Second, the atmospheric air is "inhaled" during increasing barometric pressure, thereby providing oxygen to transition from anaerobic decomposition toward aerobic decomposition.

During the reporting period, nitrate, sulfate, and chloride concentrations in groundwater at all compliance points were less than the respective CULs or cleanup standards. In addition, 5-year concentration averages for these COCs are below their respective CULs for the reporting period, suggesting the removal action was effective, and the Site is compliant for these COCs. Conductivity and pH were often reported to be outside their cleanup ranges for the reporting period. An examination of data quality and the caution about using this data is discussed above in Section 2.6.2.

3.1.2 Effectiveness for Surface Water

Table 3-2 presents a statistical summary of the analytical data by surface water location, showing the frequency of detections, minimum and maximum values detected, and the number of cleanup level exceedances from 2018 through 2022. Table 3-2 includes CULs from the 2001 CAP and Consent Decree, proposed CULs from 2011, and most-stringent MTCA Method B values. Exceedances were determined based on the 2001 CULs.

Concentrations of total iron in surface water from SWD were detected once above CULs during the reporting period. Dissolved iron concentrations in both SWD and SWU remained below CUL levels for the full reporting period. This suggests the removal action was effective for iron in surface water.

Dissolved copper concentrations were reported for four sampling events during the reporting period. Concentrations at SWD were detected above concentrations at SWU for three of the sampling events, with the remaining event showing both samples as not detected at a concentrations above the CUL. This could indicate the potential for landfill effects on dissolved copper in surface water. There are not enough data to determine a trend for this COC.

During the reporting period, dissolved zinc concentrations were not detected above the CUL. This suggests the removal action was effective for dissolved zinc in surface water.

3.2 New Scientific Information for COCs

CULs at the Site were based on regulatory standards for COCs rather than calculated risk for chemicals and/or media.

As part of a beneficial use survey, Aspect used publicly available groundwater quality data within a 2-mile radius to calculate a local background manganese concentration of 0.34 mg/L. This statistical analysis is detailed in Appendix F.

No other new scientific information was identified that affect existing CULs.

3.3 New State and Federal Laws for COCs

Regulatory standards used to establish CULs for groundwater and surface water were reviewed. This review consisted of a survey of updates to relevant state and federal standards since the time the CULs were developed. Updates are listed below:

- **Vinyl chloride**. For vinyl chloride, a new CUL of 0.02 µg/L is based on a 2016 update to WAC 173-201A-240, human health criteria based on consumption of water and organisms.
- **1,1-DCE.** As noted in the second periodic review report (CH2MHill, 2011), the toxicity value for 1,1-DCE used to calculate the carcinogenic MTCA Method B CUL of 0.073 µg/L was removed from Cleanup Levels and Risk Calculation (CLARC). The lowest current cleanup standard for 1,1-DCE is the state MCL of 7 µg/L.
- **Copper, lead, and zinc**. The CULs for hardness-dependent metals in surface water (copper, lead, and zinc) were recalculated for the first periodic review report (CH2M Hill, 2006) using methods described in Water Quality Standards for the State of Washington (Chapter 173-201A WAC). A hardness of 15 mg/L was assumed based on findings from the RI/FS. Calculated chronic water quality standards for lead and zinc matched the Consent Decree CULs. However, the chronic water quality standard for copper was calculated at 2.2 µg/L, slightly higher than the CUL in the Consent Decree of 1.8 µg/L. The December 2012 dissolved copper concentrations at SWD were below the higher CUL of 2.2 µg/L. The January 2014 results exceeded the CUL. From December 2014 through 2017, the laboratory reporting limit for nondetect results were greater than the CUL of 2.2 µg/L. Discussion of the reporting limit for dissolved copper is described above in Section 3.1.2.

3.4 Current and Projected Site and Resource Use

The Property contains a City stormwater waste Decant Facility and a transfer and recycling station. The Site is currently fenced to restrict access and has an engineered soil cap. There are no plans for future changes in land use.

Land use within a 3-mile radius of the Site consists primarily of single-family residential houses, with a small number of commercial and industrial operations. The Site is surrounded by low-density residential property, undeveloped and recently logged private property, and rural residential land.

3.5 Availability and Practicability of More Permanent Remedies

The remedy implemented included covering retained materials with a soil cap, which continues to be protective of human health and the environment. While higher preference cleanup technologies may be available, they are not practicable at this Site.

3.6 Availability of Improved Analytical Techniques

No other changes in analytical techniques were identified.

4 Conclusions and Recommendations

The cleanup actions completed at the Site appear to be protective of human health and the environment, with the exception of manganese exceedances in on-Site groundwater and increasing concentrations over time. The project is currently at the mid-point of the 30-year restoration time frame. The Site includes retained materials capped by a soil cover. Under WAC 173-340-740(6) (f) and based on current and historical Site monitoring data, the cleanup action will comply with cleanup standards within a reasonable restoration time frame. Additional actions to mitigate manganese may be necessary in the future, as described below.

The restrictive covenants for the Site are in place and will be effective in protecting public health from exposure to hazardous substances and protecting the integrity of the cleanup action.

Long-term compliance monitoring has demonstrated natural attenuation of VOCs in groundwater. Vinyl chloride concentrations remained below the CUL or continue their downward trend. Concentrations of 1,1-DCE remained below the CUL. Increasing concentrations of manganese (total and dissolved fractions) have been observed in groundwater at two on-Site compliance wells. While increasing manganese trends above the CUL have been detected at well MW-13 and MW-14, manganese concentrations have been nondetect or below the CUL in the off-property, downgradient Stetson Acres well. Groundwater results from the Stetson Acres supply well (BOW-37) met state and federal drinking water standards for all events during the monitoring period.

To address observed manganese concentrations, the City has conducted a focused investigation of manganese geochemistry (Aspect, 2020), updated the beneficial use survey (Appendix F), and installed new gas probe/vents to conduct a soil gas survey (see Appendix G). The compliance monitoring wells were found to be in good shape, and no alternative source of dissolved manganese was identified (Aspect, 2020). The beneficial use survey update did not find evidence of Site impacts to off-property public water supplies, and background manganese concentrations from public water supplies appear to be statistically higher than the Site-specific CUL. The soil gas survey found concentrations of carbon dioxide and methane in soil gas between the bottom of waste and groundwater that could influence groundwater geochemistry and explain elevated manganese concentrations.

Aspect recommends the City allows passive landfill gas collection and venting at the four new gas probe/vents, installs a biofilter at each gas probe/vent to reduce greenhouse gas emissions, and reviews long-term surface water and groundwater compliance monitoring data to determine if additional gas probe/vents are warranted. The City is working with contractors to install the biofilters as soon as practical.

4.1 Recommended Sampling Scope Adjustment

The CAP proposed that 30 years of monitoring could be required to achieve groundwater and surface water quality objectives. Continued groundwater and surface water monitoring will be required until CULs have been achieved.

Considering the manganese concentrations and trends, and the introduction of landfill gas venting, Aspect does not recommend adjustments in sampling scope at this time. We recommend the City coordinate with the laboratory to provide reporting limits below CULs. Table 4-1 lists the sampling analytes and laboratory reporting limits for surface and groundwater.

4.2 Next Periodic Review Report

The next reporting period will be from January 2023 through June 2027. In addition, the next periodic review report will assess the response of manganese concentrations to the soil gas venting, and, if concentrations continue to increase, recommend further action to address conditions causing elevated manganese.

5 References

Aspect Consulting LLC (Aspect), 2015, Memorandum re: Task 1—Hydrogeological Assessment of Groundwater Quantity, Quality, and Production, Prepared for City of Bainbridge Island, December 21, 2015.

Aspect Consulting LLC (Aspect), 2018, Third Five-Year Review Report: Bainbridge Island Landfill, Prepared for City of Bainbridge Island, May 1, 2018.

Aspect Consulting LLC (Aspect), 2020, Focused Investigation of Manganese in Groundwater: City of Bainbridge Island Landfill, October 9, 2020.

BJC Group, 2002, Engineering Closure Report, Bainbridge Island Landfill Reclamation, February 2002.

CH2M HILL, 2000a, Bainbridge Island Landfill Remedial Investigation.

CH2M HILL, 2000b, Bainbridge Island Landfill Feasibility Study.

CH2M HILL, Sampling and Analysis Plan, September 2001.

CH2M HILL, 2006, First Five-Year Review Report for Bainbridge Island Landfill, Kitsap County Washington, Prepared for City of Bainbridge Island, December 2006.

CH2M HILL, 2011, Second Five-Year Review Report for Bainbridge Island Landfill, Kitsap County Washington, Prepared for City of Bainbridge Island, December 2012.

Ecology & Environment, Inc., 1986, Bainbridge Island Landfill Site Inspection Report, Prepared for U.S. EPA Region 10.

Golder & Associates, 1993, Independent Remedial Action Report, Prepared for Kitsap County,

Kitsap County Health District (KCHD), 2006, Sampling Plan for Bainbridge Island Decant Facility, 2006.

Personal communication with Ching-Pi Wang, February through April 2018.

U.S. Geological Survey (USGS), 2011, *Conceptual Model and Numerical Simulation of Groundwater-Flow System of Bainbridge Island, Washington.* USGS Scientific Investigations Report 2011-5021.

U.S. Environmental Protection Agency (EPA), 2001, Comprehensive Five-Year Review Guidance, Office of Emergency and Remedial Response (5204G), EPA 540-R-01-007. OSWER No. 9355.7-03B-P, June 2001.

Washington State Department of Ecology (Ecology), 1998, Minimum Standards for Construction and Maintenance of Wells, Chapter 173-160 WAC, September 1998.

Washington State Department of Ecology (Ecology), 2001a, Consent Decree for the Bainbridge Island Landfill, 2001.

Washington State Department of Ecology (Ecology), 2001b, Cleanup Action Plan for the Bainbridge Island Landfill, 2001.

Washington State Department of Ecology (Ecology), 2005, Model Toxics Control Act Chapter 70.lOSD RCW and Cleanup Regulation Chapter 173-340 WAC, Publication No. 94-06, Revised October 2005.

Washington State Department of Ecology (Ecology), Cleanup Levels and Risk Calculations under the Model Toxics Control Act Cleanup Regulations (CLARC) Database, https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx, April 2018.

Limitations

Work for this project was performed for the City of Bainbridge (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

TABLES

Table 2-1. Monitoring Well Groundwater Elevation Data 2018-2022

Project No. 120097-003, Brainbridge Island Landfill, Bainbridge Island, WA

Location ID	BMW-12		BMW-13		BMW-14		BMW-15	
PVC Casing Elevation[1,2]	278.43		255.92		271.42		277.69	
Date	DTW	Elevation	DTW	Elevation	DTW	Elevation	DTW	Elevation
June 15, 2018	139.95	138.48	123.90	132.02	139.70	131.72	146.35	131.34
December 20, 2018	-	-	-	-	-	-	-	-
June 25, 2019	141.80	136.63	126.00	129.92	141.20	130.22	147.60	130.09
December 17, 2019	142.30	136.13	127.60	128.32	142.50	128.92	148.70	128.99
June 23, 2020	143.40	135.03	127.80	128.12	143.30	128.12	149.30	128.39
December 16, 2020	144.40	134.03	129.00	126.92	144.00	127.42	150.20	127.49
June 16, 2021	144.70	133.73	128.00	127.92	143.70	127.72	150.30	127.39
December 15, 2021	145.00	133.43	129.10	126.82	144.50	126.92	150.80	126.89
June 8, 2022	144.40	134.03	127.30	128.62	143.30	128.12	150.00	127.69
December 13, 2022	144.55	133.88	128.40	127.52	143.95	127.47	150.50	127.19

Notes

1. Measurements of the top of the PVC casing are based on available data from the First and Second Five-Year Review Reports.
2. Elevations are in feet NAVD-88.

"-" indicates data not available

PVC = polyvinyl chloride

DTW = depth to water

Table 2-2. Contaminants of Concern and Cleanup Levels

Project No. 120097-003, Brainbridge Island Landfill, Bainbridge Island, WA

Contaminant	Analytical Method	Reporting Limit	Surface	Groundwater
			Cleanup Level[1] (Proposed Cleanup Level)	
Field Parameters				
Conductivity[2]			-	700 umhos/cm
Dissolved Oxygen			>9.5 mg/L	-
pH[2]			6.5 to 8.5	6.5 to 8.5
Turbidity			5.0 NTU	-
Conventionals				
Alkalinity	SM 2320B	5.0 mg/L	20 mg/L	-
Chloride[2]	EPA 300.0	1.00 to 0.100 mg/L	-	(250 mg/L)
Nitrate (and nitrite + nitrate)[2]	EPA 300.0	0.100 to 0.200 mg/L	-	(10 mg/L)
Sulfate[2]	EPA 300.0	3.5 to 0.300 mg/L	-	(250 mg/L)
Metals				
Copper, Total[2,3]	EPA 6020	1.0 ug/L	1.8 ug/L	-
Iron, Total[2,3]	EPA 6010	50.0 ug/L	1000 ug/L	(300 ug/L)
Manganese, Total[2,3]	EPA 6010	5.0 ug/L	(50 ug/L)	50 ug/L
Zinc, Total[2,3]	EPA 6010	20.0 ug/L	21 ug/L	-
VOCs				
1,1-dichloroethene	EPA 8260 SIM	0.00212 ug/L	-	0.073 ug/L
vinyl chloride	EPA 8260 SIM	0.00418 ug/L	-	0.023 ug/L

Notes

1. Cleanup levels adopted by the Consent Decree (Ecology 2001), adapted from Table 1 of the CAP.
2. Secondary drinking water standards from WAC 173-200.
3. Metals cleanup levels based on total metals analysis.

μg/L = micrograms per liter
mg/L = milligrams per liter
VOCs = volatile organic compounds
CFU/mL = colony forming units per 100 milliliters of sample
(-) = Not established

Table 2-3. Groundwater Monitoring Results by Monitoring Well

Project No. 120097, City of Bainbridge Island, Washington

Chemical Name	Units	Cleanup Levels	BMW-12											
			6/29/12	12/18/12	10/3/13	12/18/13	6/12/14	12/16/14	6/16/15	12/21/15	6/14/16	12/15/16	6/20/17	12/11/17
Conventionals														
Alkalinity as Bicarbonate	mg/L as CaCO3		--	--	46.8	51	67.7	63.8	59.4	52.4	54.3	55.5	57.9	62
Alkalinity, Total	mg/L as CaCO3	**20**	**59.5**	**58.1**	**46.8**	**51**	**67.7**	**63.8**	**59.4**	**52.4**	**54.3**	**55.5**	**57.9**	**62**
Chloride	mg/L		2.7	3.7	6.9	9.31	8.19	5.83	5.24	6.02	9.57	7.33	5	4.05
Nitrate as Nitrogen	mg/L as N		--	0.85	2.6	2.6	2.41	1.27	1.34	2.61	3.38	2.51	1.26	1.25
Nitrate-Nitrite	mg/L as N		0.72	0.85	2.6	2.6	2.41	1.27	1.2	2.8	3.6	2.4	1.3	1.3
Sulfate	mg/L		9.8	9.2	8.3	7.89	8.47	7.99	8.18	7.26	7.47	8.52	7.86	6.7
Field Parameters														
Conductivity	uS/cm	700	--	--	161.2	168.2	185.3	177.2	137.2	132.5	185.3	165.1	--	0.163
Dissolved Oxygen	mg/L	**9.5**	--	--	**10.07**	**10.1**	**9.66**	**10.06**	**11.04**	**91.9**	**--**	**11.3**	**11.33**	**10.6**
pH	pH units	**8.5**	--	--	7.24	7.57	7.16	7.68	7.65	7.6	7.47	7.81	7.9	6.86
Turbidity	NTU	5	--	--	2.95	0.54	0.24	0.14	0.18	0.15	0.69	0.21	0.21	0.48
Metals														
Dissolved Iron	mg/L	1	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Manganese	mg/L	0.05[1]	0.015 U	0.005 U	0.005 U	0.005 U	0.005 U	0.0292	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Total Iron	mg/L	1	--	--	--	--	--	--	--	--	--	--	--	--
Total Manganese	mg/L	0.05[1]	0.015 U	0.005 U	0.0108	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
VOCs														
1,1-Dichloroethene	ug/L	**0.073**	0.073 U	0.073 U	0.073 U	0.00133 U	0.00418 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U
Vinyl Chloride	ug/L	**0.023**	0.02 U	0.02 U	0.02 U	0.02 U	0.00418 U	0.00418 U	0.00418 U	0.00418 U	0.00418 U	0.00418 U	0.00418 U	0.00418 U

Notes:

1) Local background concentratations for manganese have been calculated at 0.341 mg/L (see appendix F)

Bold - Detected result or nondetected RL exceeded screening level

U - Analyte not detected at or above Reporting Limit (RL) shown

J - Result value estimated

UJ - Analyte not detected and the Reporting Limit (RL) is an estimate

"--" - indicates results not available

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

mg/L = milligram per liter

ug/L = microgram per liter

Table 2-3. Groundwater Monitoring Results by Monitoring Well

Project No. 120097, City of Bainbridge Island, Washington

Chemical Name	Units	Cleanup Levels	BMW-12												
			6/15/18	12/20/18	6/25/19	12/17/19	5/27/20	6/23/20	7/15/20	8/27/20	12/16/20	6/16/21	12/15/21	6/8/22	12/13/22
Conventionals															
Alkalinity as Bicarbonate	mg/L as CaCO3		53.3	--	--	--	68.2	68.2	2.50 U	68.2	--	52.3	--	--	66.6
Alkalinity, Total	mg/L as CaCO3	**20**	**53.3**	**--**	**--**	**--**	**68.2**	**68.2**	**58.5**	**68.2**	**58.8**	**52.3**	**--**	**--**	**70.2**
Chloride	mg/L		3.19	--	--	--	4.15	4.59	3.84	3.84	--	5.18 J	14.9	31.6	15.8
Nitrate as Nitrogen	mg/L as N		0.8	--	--	--	1.42	1.58	1.26	1.15	--	1.22 J	1.87	2.2	1.79
Nitrate-Nitrite	mg/L as N		0.83	0.785 J	1.75	2.15	1.42	--	1.26	1.15	1.47	--	--	--	--
Sulfate	mg/L		6.74	--	--	--	7.45	7.7	7.10	7.51	--	7.84	9.26	8.88	8.72
Field Parameters															
Conductivity	uS/cm	700	3.1	--	163.9	189.4	--	--	--	--	--	--	2.0	--	200.0
Dissolved Oxygen	mg/L	**9.5**	**10.49**	**--**	8.37	**10.37**	**--**	8.12	**--**	**--**	**10.33**	**--**	**10.54**	**--**	**--**
pH	pH units	**8.5**	7.04	--	7.22	7.05	--	5.61	--	--	7.48	6.32	7.45	**6.49**	7.13
Turbidity	NTU	5	0.13	--	0.29	0.36	--	0.50	--	--	1.00	0.62	0.46	0.58	0.39
Metals															
Dissolved Iron	mg/L	1	--	--	--	--	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.1 U	0.1 U
Dissolved Manganese	mg/L	0.05[1]	0.005 U	0.002 U	0.002 U	0.002 U	0.00230	0.002 U	0.00200 U	0.00200 U	0.002 U	0.0018 U	--	0.0018 U	0.0018 U
Total Iron	mg/L	1	--	--	--	--	--	--	--	--	0.1 U	--	1 U	0.1 U	--
Total Manganese	mg/L	0.05[1]	0.005 U	0.002 U	0.002 U	0.005 U	--	0.005 U	--	--	0.005 U	0.005 U	--	0.005 U	0.005 U
VOCs															
1,1-Dichloroethene	ug/L	**0.073**	0.01 U	0.01 U	0.01 U	0.01 U	--	0.01 U	--	--	--	0.01 U	**0.5 U**	**0.5 U**	0.025 U
Vinyl Chloride	ug/L	**0.023**	0.01 U	0.01 U	0.01 U	0.01 U	--	0.01 U	--	--	**0.2 U**	0.01 U	**0.2 U**	**0.2 U**	**0.1 U**

Notes:

1) Local background concentratations for manganese have been calculated at 0.341 mg/L (see appendix F)

Bold - Detected result or nondetected RL exceeded screening level

U - Analyte not detected at or above Reporting Limit (RL) shown

J - Result value estimated

UJ - Analyte not detected and the Reporting Limit (RL) is an estimate

"--" - indicates results not available

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

mg/L = milligram per liter

ug/L = microgram per liter

Table 2-3. Groundwater Monitoring Results by Monitoring Well

Project No. 120097, City of Bainbridge Island, Washington

Chemical Name	Units	Cleanup Levels	BMW-13											
			6/29/12	12/18/12	10/3/13	12/18/13	6/12/14	12/16/14	6/16/15	12/21/15	6/14/16	12/15/16	6/20/17	12/11/17
Conventionals														
Alkalinity as Bicarbonate	mg/L as CaCO3		--	--	264	229	271	346	428	295	323	418	476	372
Alkalinity, Total	mg/L as CaCO3	**20**	**400**	**347**	**264**	**229**	**271**	**346**	**428**	**295**	**323**	**418**	**476**	**372**
Chloride	mg/L		5.9	5.3	5.4	6.33	5.94	6.49	7.6	6.18	6.34	10.4	9.83	8.2
Nitrate as Nitrogen	mg/L as N		--	0.18	0.36	0.631	0.317	0.405	0.977	0.1 U	0.5 U	0.1 U	0.2 U	0.1 U
Nitrate-Nitrite	mg/L as N		0.13	0.18	0.36	0.631	0.317	0.405	0.3	0.19	0.05	0.02 U	0.02 U	0.022 U
Sulfate	mg/L		23.4	14.8	13.1	10.1	14	20.5	27.7	13.6	15	25	20.8	9.96
Field Parameters														
Conductivity	uS/cm	**700**	--	--	619.9	480.5	498.9	687	**707**	349.2	628.6	**702.2**	--	0.72
Dissolved Oxygen	mg/L	**9.5**	--	--	0.49	1.16	0.6	1.81	0.72	**9.6**	--	0.47	0.25	0.63
pH	pH units	**8.5**	--	--	6.59	6.8	6.53	6.79	6.72	6.69	6.55	7.04	6.52	**6.08**
Turbidity	NTU	5	--	--	0.60	0.94	0.3	0.9	0.37	0.48	0.55	0.44	0.19	--
Metals														
Dissolved Iron	mg/L	1	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Manganese	mg/L	**0.05[1]**	**2.43**	**2.07**	**2.22**	**1.67**	**1.73**	**1.99**	**3.08**	**1.86**	**2.26**	**3.24**	**3.6**	**2.89**
Total Iron	mg/L	1	--	--	--	--	--	--	--	--	--	--	--	--
Total Manganese	mg/L	**0.05[1]**	**2.58**	**2.12**	**2.01**	**1.59**	**1.75**	**2.17**	**3.02**	**1.9**	**2.22**	**3.29**	**3.64**	**2.95**
VOCs														
1,1-Dichloroethene	ug/L	**0.073**	0.073 U	0.073 U	0.073 U	0.00133 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U	0.01	0.00212 U	0.00212 U	0.00212 U
Vinyl Chloride	ug/L	**0.023**	**0.28**	0.02 U	0.02 U	**0.05**	**0.11**	**0.047**	0.00418 U	0.00418 U	**0.03**	0.00418 U	0.00418 U	0.00418 U

Notes

1) Local background concentratations for manganese have been calculated at 0.341 mg/L (see appendix F)

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NTU = Nephelometric Turbidity Units

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ug/L = microgram per liter

Table 2-3. Groundwater Monitoring Results by Monitoring Well

Project No. 120097, City of Bainbridge Island, Washington

Chemical Name	Units	Cleanup Levels	BMW-13												
			6/15/18	12/20/18	6/25/19	12/17/19	5/27/20	6/23/20	7/15/20	8/27/20	12/16/20	6/16/21	12/15/21	6/8/22	12/13/22
Conventionals															
Alkalinity as Bicarbonate	mg/L as CaCO3		351	--	--	--	219	361	399	457	--	516	--	--	493
Alkalinity, Total	mg/L as CaCO3	**20**	**351**	**--**	**--**	**--**	**219**	**361**	**400**	**458**	**519**	**516**	**--**	**--**	**525**
Chloride	mg/L		7.75	--	--	--	5.15	5.13	5.38	5.78	--	8.94 J	8.57	7.8	9.04
Nitrate as Nitrogen	mg/L as N		0.152	--	--	--	1.42	1.5	1.40	1.67	--	0.357 J	0.24	0.231	0.579
Nitrate-Nitrite	mg/L as N		0.14	2.26 J	0.925	1.68	1.42	--	1.40	1.67	1.44	--	--	--	--
Sulfate	mg/L		19	--	--	--	19.2	24.3	24.2	31.9	--	50.4	25.3	17.1	29.4
Field Parameters															
Conductivity	uS/cm	**700**	528.2	--	313.6	14.8	--	--	--	--	--	--	18.8	--	**984.0**
Dissolved Oxygen	mg/L	**9.5**	7.72	--	0.18	0.29	--	5.34	--	--	0.38	--	4.12	--	5.10
pH	pH units	**8.5**	**6.31**	--	**6.48**	6.53	--	6.03	--	--	**6.48**	**5.86**	6.52	**6.49**	**6.41**
Turbidity	NTU	5	0.02	--	0.83	0.40	--	0.89	--	--	0.27	0.76	0.74	1.05	0.30
Metals															
Dissolved Iron	mg/L	1	--	--	--	--	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.1 U	0.1 U
Dissolved Manganese	mg/L	**0.05**[1]	**3.02**	**1.38**	**1.3**	**1.28**	**2.45**	**2.91**	**1.58**	**3.58**	**4.93**	**5.62**	--	**4.53**	**4.82**
Total Iron	mg/L	1	--	--	--	--	--	--	--	--	0.1 U	--	1 U	0.1 U	--
Total Manganese	mg/L	**0.05**[1]	**3.04**	**1.55**	**1.31**	**1.42**	**--**	**2.95**	**--**	**--**	**4.54**	**6.39**	--	**4.46**	**5.16**
VOCs															
1,1-Dichloroethene	ug/L	**0.073**	0.01 U	0.01 U	0.01 U	0.01 U	--	0.01 U	--	--	--	0.01 U	**0.5 U**	**0.5 U**	0.025 U
Vinyl Chloride	ug/L	**0.023**	0.01 U	0.01 U	0.01 U	0.01 U	--	0.01 U	--	--	**0.2 U**	0.01 U	**0.2 U**	**0.2 U**	**0.1 U**

Notes

1) Local background concentratations for manganese have been calculated at 0.341 mg/L (see appendix F)

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mg/L = milligram per liter

ug/L = microgram per liter

Table 2-3. Groundwater Monitoring Results by Monitoring Well

Project No. 120097, City of Bainbridge Island, Washington

Chemical Name	Units	Cleanup Levels	BMW-14											
			6/29/2012	12/18/2012	10/3/2013	12/18/2013	6/12/2014	12/16/2014	6/16/2015	12/21/2015	6/14/2016	12/15/2016	6/20/2017	12/11/2017
Conventionals														
Alkalinity as Bicarbonate	mg/L as CaCO3		--	--	307	284	309	328	349	342	353	321	359	368
Alkalinity, Total	mg/L as CaCO3	**20**	**291**	**320**	**307**	**284**	**309**	**328**	**349**	**342**	**353**	**321**	**359**	**368**
Chloride	mg/L		3.3	3.7	5.4	14.4	11.2	20.5	16.3	16.5	11	13.9	11.1	10.3
Nitrate as Nitrogen	mg/L as N		--	5.6	6.2	4.65	3.64	1.85	2.43	0.313	1 U	0.686	0.44	0.2 U
Nitrate-Nitrite	mg/L as N		7.6	5.6	6.2	4.65	3.64	1.85	2.9	1.6	0.71	0.84	0.02	0.02
Sulfate	mg/L		54.4	41.1	35.1	35.4	35.3	41	41.1	41.8	55.3	28.6	65.5	25.1
Field Parameters														
Conductivity	uS/cm	**700**	--	--	619.5	673	643	**726**	675	**727**	3.8	687	--	0.77
Dissolved Oxygen	mg/L	**9.5**	--	--	0.45	0.7	0.59	0.54	0.69	**9.6**	--	9.04	0.16	0.48
pH	pH units	**8.5**	--	--	6.65	6.78	6.59	6.78	6.82	6.75	**6.2**	7.01	6.53	**6.18**
Turbidity	NTU	**5**	--	--	**20.8**	3.36	0.8	0.17	**6.44**	0.17	0.49	0.15	0.09	0.02
Metals														
Dissolved Iron	mg/L	1	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Manganese	mg/L	**0.05**[1]	0.015 U	0.0129	0.0228	0.0217	0.0248	0.0329	0.0205	0.0348	0.0217	0.0289	0.0335	0.0477
Total Iron	mg/L	1	--	--	--	--	--	--	--	--	--	--	--	--
Total Manganese	mg/L	**0.05**[1]	0.015 U	0.0107	0.0402	0.0326	0.0123	0.0236	0.0213	0.0344	0.0198	0.0295	0.0353	0.0461
VOCs														
1,1-Dichloroethene	ug/L	**0.073**	0.073 U	0.073 U	0.073 U	0.00133 U	0.0206	0.0268	0.00212 U	0.0112	0.03	0.00212 U	0.00212 U	0.00212 U
Vinyl Chloride	ug/L	**0.023**	**0.23**	0.02 U	0.02 U	**0.17**	**0.36**	**0.351**	**0.215**	**0.279**	**0.29**	0.00418 U	0.00418 U	0.00418 U

Notes

1) Local background concentratations for manganese have been calculated at 0.341 mg/L (see appendix F)

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mg/L = milligram per liter

ug/L = microgram per liter

Table 2-3. Groundwater Monitoring Results by Monitoring Well

Project No. 120097, City of Bainbridge Island, Washington

Chemical Name	Units	Cleanup Levels	BMW-14												
			6/15/2018	12/20/2018	6/25/2019	12/17/2019	5/27/2020	6/23/2020	7/15/2020	8/27/2020	12/16/2020	6/16/2021	12/15/2021	6/8/2022	12/13/2022
Conventionals															
Alkalinity as Bicarbonate	mg/L as CaCO3		355	--	--	--	385	403	409	399	--	311	--	--	261
Alkalinity, Total	mg/L as CaCO3	**20**	**355**	**--**	**--**	**--**	**385**	**403**	**410**	**400**	**384**	**311**	**--**	**--**	**332**
Chloride	mg/L		10.5	--	--	--	8.74	9.16	8.36	8.66	--	8.17 J	8.7	6.14	7.32
Nitrate as Nitrogen	mg/L as N		0.2	--	--	--	0.110	0.107	0.134	0.100 U	--	0.141 J	0.1	0.392	0.454
Nitrate-Nitrite	mg/L as N		0.1	0.2 J	0.1 U	0.203	0.110 J	--	0.134	0.100 U	0.1 U	--	--	--	--
Sulfate	mg/L		24.5	--	--	--	28.6	38.5	29.3	29.2	--	23.3	38.4	16.9	19.8
Field Parameters															
Conductivity	uS/cm	**700**	2.4	--	**746.0**	**787.0**	--	--	--	--	--	**--**	5.6	**--**	651.0
Dissolved Oxygen	mg/L	**9.5**	8.18	--	0.27	0.29	--	5.83	--	--	--	--	--	--	4.10
pH	pH units	**8.5**	**6.04**	--	**6.46**	**6.42**	--	**5.94**	--	--	6.54	**5.97**	**4.30**	**6.25**	6.53
Turbidity	NTU	**5**	0.02	--	0.41	0.34	--	0.49	--	--	0.54	0.48	--	0.25	0.29
Metals															
Dissolved Iron	mg/L	1	--	--	--	--	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.1 U	0.1 U
Dissolved Manganese	mg/L	**0.05**[1]	0.0197	**0.051**	0.0346	**0.0531**	0.0270	0.0411	0.0199	0.0475	**0.0742**	0.0377	--	0.0357	**0.0635**
Total Iron	mg/L	1	--	--	--	--	--	--	--	--	0.1 U	--	1 U	0.1 U	--
Total Manganese	mg/L	**0.05**[1]	0.0204	**0.0501**	0.0383	**0.0566**	--	0.0421	--	--	**0.0726**	0.0338	--	0.0317	**0.0667**
VOCs															
1,1-Dichloroethene	ug/L	**0.073**	0.01 U	0.028	0.01 U	0.01 U	--	0.018	--	--	--	0.0218	**0.5 U**	**0.5 U**	0.025 U
Vinyl Chloride	ug/L	**0.023**	0.01 U	**0.226**	**0.263**	**0.228**	--	**0.164**	--	--	**0.2 U**	**0.142**	**0.2 U**	**0.2 U**	**0.124**

Notes

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Table 2-3. Groundwater Monitoring Results by Monitoring Well

Project No. 120097, City of Bainbridge Island, Washington

Chemical Name	Units	Cleanup Levels	BMW-15											
			6/29/12	12/18/12	10/3/13	12/18/13	6/12/14	12/16/14	6/16/15	12/21/15	6/14/16	12/15/16	6/20/17	12/11/17
Conventionals														
Alkalinity as Bicarbonate	mg/L as CaCO3		--	--	234	231	249	243	277	256	305	254	333	324
Alkalinity, Total	mg/L as CaCO3	**20**	**272**	**288**	**234**	**231**	**249**	**243**	**277**	**256**	**305**	**254**	**333**	**324**
Chloride	mg/L		7.8	6.2	5.4	6.31	5.54	4.92	7.93	7.61	11.2	5.36	14.6	16.9
Nitrate as Nitrogen	mg/L as N		--	0.78	0.43	0.614	0.435	0.484	0.436	0.1 U	1 U	0.1 U	0.88	0.91
Nitrate-Nitrite	mg/L as N		1.4	0.78	0.43	0.614	0.435	0.484	0.52	0.22	0.59	0.38	0.65	0.85
Sulfate	mg/L		127	67.8	52.8	51.2	43	34.8	61.9	42.9	78	22.1	97.9	66.5
Field Parameters														
Conductivity	uS/cm	**700**	--	--	576.9	565.7	523.6	588.4	565.6	568.2	5.2	6.3	--	0.83
Dissolved Oxygen	mg/L	**9.5**	--	--	2.66	3.1	3.71	2.6	8.84	**32.5**	--	2.03	0.44	0.61
pH	pH units	**8.5**	--	--	6.68	6.82	6.67	6.89	6.87	6.85	6.65	6.99	6.66	**6.22**
Turbidity	NTU	**5**	--	--	**20.8**	0.59	0.33	0.21	0.35	0.41	1.02	0.35	0.11	0.02
Metals														
Dissolved Iron	mg/L	1	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Manganese	mg/L	0.05[1]	0.015 U	0.0076	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Total Iron	mg/L	1	--	--	--	--	--	--	--	--	--	--	--	--
Total Manganese	mg/L	0.05[1]	0.015 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
VOCs														
1,1-Dichloroethene	ug/L	**0.073**	0.073 U	0.073 U	0.073 U	0.00133 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U
Vinyl Chloride	ug/L	**0.023**	0.02 U	0.02 U	0.02 U	0.02 U	0.00418 U	0.00418 U	0.00418 U	0.00418 U	0.00418 U	0.00418 U	0.00418 U	0.00418 U

Notes

1) Local background concentratations for manganese have been calculated at 0.341 mg/L (see appendix F)

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Table 2-3. Groundwater Monitoring Results by Monitoring Well

Project No. 120097, City of Bainbridge Island, Washington

Chemical Name	Units	Cleanup Levels	BMW-15									
			6/15/18	12/20/18	6/25/19	12/17/19	6/23/20	12/16/20	6/16/21	12/15/21	6/8/22	12/13/22
Conventionals												
Alkalinity as Bicarbonate	mg/L as CaCO3		319	--	--	--	331	--	245	--	--	218
Alkalinity, Total	mg/L as CaCO3	**20**	**319**	**--**	**--**	**--**	**332**	**304**	**245**	**--**	**--**	**269**
Chloride	mg/L		18.9	--	--	--	13.3	--	24.5 J	27.4	24.4	24
Nitrate as Nitrogen	mg/L as N		0.785	--	--	--	2.03	--	3.41 J	4	3.8	2.6
Nitrate-Nitrite	mg/L as N		0.7	0.584 J	1.03	1.44	--	2.95	--	--	--	--
Sulfate	mg/L		72.9	--	--	--	110	--	54	43.4	42.4	38.4
Field Parameters												
Conductivity	uS/cm	**700**	656.0	--	**808.0**	**877.0**	--	--	--	7.2	--	661.0
Dissolved Oxygen	mg/L	**9.5**	1.33	--	1.08	0.44	**9.57**	0.12	--	6.05	--	--
pH	pH units	**8.5**	**6.43**	--	**6.48**	**6.43**	**6.25**	6.53	**5.94**	6.64	**6.26**	6.55
Turbidity	NTU	**5**	0.06	--	0.69	0.41	0.40	0.87	0.34	0.80	0.36	0.41
Metals												
Dissolved Iron	mg/L	1	--	--	--	--	0.1 U	0.1 U	0.1 U	0.2 U	0.1 U	0.1 U
Dissolved Manganese	mg/L	0.05[1]	0.005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U	--	0.0018 U	0.0018 U
Total Iron	mg/L	1	--	--	--	--	--	0.1 U	--	1 U	0.1 U	--
Total Manganese	mg/L	0.05[1]	0.005 U	0.002 U	0.00201	0.005 U	0.005 U	0.005 U	0.005 U	--	0.005 U	0.005 U
VOCs												
1,1-Dichloroethene	ug/L	**0.073**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	--	0.01 U	**0.5 U**	**0.5 U**	0.025 U
Vinyl Chloride	ug/L	**0.023**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.2 U**	0.01 U	**0.2 U**	**0.2 U**	**0.1 U**

Notes

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Table 2-3. Groundwater Monitoring Results by Monitoring Well

Project No. 120097, City of Bainbridge Island, Washington

Chemical Name	Units	Cleanup Levels	BOW-37											
			6/29/12	12/18/12	10/3/13	12/18/13	6/12/14	12/16/14	6/16/15	12/21/15	6/14/16	12/15/16	6/20/17	12/11/17
Conventionals														
Alkalinity as Bicarbonate	mg/L as CaCO3		--	--	189	202	192	180	177	193	167	163	148	135
Alkalinity, Total	mg/L as CaCO3	**20**	**219**	**227**	**189**	**202**	**192**	**180**	**177**	**193**	**167**	**163**	**148**	**135**
Chloride	mg/L		5.4	3.7	5.3	6.09	4.79	5.09	5.73	6.01	4.82	5.53	4.82	5.92
Nitrate as Nitrogen	mg/L as N		--	1.4	1.9	1.86	1.33	1.68	1.69	1.65	1.24	1.8	1.88	1.73
Nitrate-Nitrite	mg/L as N		1.4	1.4	1.9	1.86	1.33	1.68	1.7	1.8	1.4	2	1.9	2.5
Sulfate	mg/L		12.9	53.2	12	12.1	11	9.92	10.7	10.6	9.21	10.4	9.06	6.74
Field Parameters														
Conductivity	uS/cm	700	--	--	419.8	444	378.4	394.9	334.8	316.3	353.9	377.9	--	0.319
Dissolved Oxygen	mg/L	**9.5**	--	--	6.23	5.82	8.1	5.71	6.75	**82.2**	--	7.26	7.36	7.43
pH	pH units	**8.5**	--	--	6.89	7.01	6.85	7.11	7.1	7.18	6.9	7.45	7.03	6.56
Turbidity	NTU	5	--	--	0.26	0.47	0.08	0.09	0.12	0.26	0.35	0.21	0.03	0.02
Metals														
Dissolved Iron	mg/L	1	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Manganese	mg/L	0.05[1]	0.015 U	0.0113	0.0109	0.0054	0.0055	0.005	0.0062	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Total Iron	mg/L	1	--	--	--	--	--	--	--	--	--	--	--	--
Total Manganese	mg/L	0.05[1]	0.015 U	0.0134	0.0082	0.0050 U	0.005 U	0.005 U	0.0065	0.005 U	0.0056	0.005 U	0.005 U	0.005 U
VOCs														
1,1-Dichloroethene	ug/L	**0.073**	0.073 U	0.073 U	0.073 U	0.00133 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U	0.00212 U
Vinyl Chloride	ug/L	**0.023**	0.02 U	0.02 U	0.02 U	0.02 U	**0.07**	**0.032**	0.00418 U	0.00418 U	0.01	0.00418 U	0.00418 U	0.00418 U

Notes

1) Local background concentratations for manganese have been calculated at 0.341 mg/L (see appendix F)

Bold - Detected result or nondetected RL exceeded screening level

U - Analyte not detected at or above Reporting Limit (RL) shown

J - Result value estimated

UJ - Analyte not detected and the Reporting Limit (RL) is an estimate

"--" - indicates results not available

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

mg/L = milligram per liter

ug/L = microgram per liter

Table 2-3. Groundwater Monitoring Results by Monitoring Well

Project No. 120097, City of Bainbridge Island, Washington

Chemical Name	Units	Cleanup Levels	BOW-37								
			6/15/18	12/20/18	6/25/19	12/17/19	6/23/20	12/16/20	6/16/21	12/15/21	6/8/22
Conventionals											
Alkalinity as Bicarbonate	mg/L as CaCO3		124	--	--	--	156	--	120	--	--
Alkalinity, Total	mg/L as CaCO3	**20**	**124**	**--**	**--**	**--**	**156**	**146**	**120**	**--**	**--**
Chloride	mg/L		5.74	--	--	--	5.3	--	5.63 J	5.4	6.04
Nitrate as Nitrogen	mg/L as N		2.46	--	--	--	1.19	--	1.26 J	1.06	1.58
Nitrate-Nitrite	mg/L as N		2.3	1.79 J	1.38	1.22	--	1.07	--	--	--
Sulfate	mg/L		9.27	--	--	--	8.2	--	8.37	7.84	7.66
Field Parameters											
Conductivity	uS/cm	700	2.0	--	295.2	296.3	--	--	--	291.4	--
Dissolved Oxygen	mg/L	**9.5**	6.70	--	6.73	6.71	**12.86**	5.77	--	7.03	--
pH	pH units	**8.5**	6.62	--	6.59	6.71	**6.3**	6.92	**6.09**	6.92	**6.33**
Turbidity	NTU	5	0.02	--	0.84	0.42	0.33	0.38	0.24	0.86	1.42
Metals											
Dissolved Iron	mg/L	1	--	--	--	--	0.1 U	0.1 U	0.1 U	0.2 U	0.1 U
Dissolved Manganese	mg/L	0.05[1]	0.005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00274	0.0019	--	0.00253
Total Iron	mg/L	1	--	--	--	--	--	0.1 U	--	1 U	0.1 U
Total Manganese	mg/L	0.05[1]	0.005 U	0.002 U	0.00463	0.005 U	0.005 U	0.005 U	0.005 U	--	0.005 U
VOCs											
1,1-Dichloroethene	ug/L	**0.073**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	--	0.01 U	**0.5 U**	**0.5 U**
Vinyl Chloride	ug/L	**0.023**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.2 U**	0.01 U	**0.2 U**	**0.2 U**

Notes

1) Local background concentratations for manganese have been calculated at 0.341 mg/L (see appendix F)

Bold - Detected result or nondetected RL exceeded screening level

U - Analyte not detected at or above Reporting Limit (RL) shown

J - Result value estimated

UJ - Analyte not detected and the Reporting Limit (RL) is an estimate

"--" - indicates results not available

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

mg/L = milligram per liter

ug/L = microgram per liter

Table 2-4. Surface Water Monitoring Results by Sampling Location

Project No. 120097, Bainbridge Island Landfill, Bainbridge Island, WA

Chemical Name	Units	Cleanup Levels	SW-1U										
			12/18/12	1/29/14	12/16/14	12/21/15	12/14/16	12/12/17	12/20/18	12/18/19	12/16/20	12/15/21	12/13/22
Conventionals													
Alkalinity as Bicarbonate	mg/L as CaCO3		--	11.8	13.5	7.3	11.7	23.1	--	--	--	--	--
Alkalinity, Total	mg/L as CaCO3	**20**	5 U	11.8	13.5	7.3	11.7	**23.1**	10.6	**31.2**	7.84	8.71	14
Field Parameters													
Conductivity	uS/cm	700	--	46.1	3.3	43.1	46.9	0.06	66.4	90.8	--	41.5	60.3
Dissolved Oxygen	mg/L	**9.5**	--	**10.64**	**9.79**	7.32	**10.76**	**9.61**	**10.83**	7.00	6.74	**12.62**	**--**
pH	pH units	**8.5**	--	**5.7**	7.39	7.13	**6.25**	**6.16**	**6.05**	6.51	**6.21**	**6.25**	**6.00**
Turbidity	NTU	**5**	--	**33.5**	**16.2**	**15.9**	**12.1**	**7.3**	**24.70**	**9.11**	**29.70**	**20.30**	**19.90**
Metals													
Dissolved Copper	mg/L	**0.0018**	0.0015	0.0016 J	**0.01 U**	**0.01 U**	**0.01 U**	**0.01 U**	0.00146	--	**0.00406 UJ**	**0.002 U**	**0.002 U**
Total Copper	mg/L	**0.0018**	--	--	--	--	--	--	--	**0.002 U**	**0.002 U**	**0.002 U**	--
Dissolved Iron	mg/L	1	0.535	0.651	0.467	0.256	0.547	0.582	0.37	0.665	0.723	0.309	0.458
Total Iron	mg/L	**1**	0.784	**1.63**	0.408	0.632	0.916	0.788	0.69	0.667	0.649	0.561	0.488
Dissolved Zinc	ug/L	21	5 U	4.4 UJ	20 U	20 U	20 U	20 U	3.5 U	--	3.49	3.8 U	3.96
Total Zinc	ug/L	21	--	--	--	--	--	--	--	6.56	2.62	2.85	--

Notes

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"--" - indicates results not available

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

mg/L = milligram per liter

ug/L = microgram per liter

Table 2-4. Surface Water Monitoring Results by Sampling Location

Project No. 120097, Bainbridge Island Landfill, Bainbridge Island, WA

Chemical Name	Units	Cleanup Levels	SW-4D										
			12/18/12	1/29/14	12/16/14	12/22/15	12/14/16	12/12/17	12/20/18	12/18/19	12/16/20	12/15/21	12/13/22
Conventionals													
Alkalinity as Bicarbonate	mg/L as CaCO3		--	12.7	12.8	9.4	11.6	23.3	--	--	--	--	--
Alkalinity, Total	mg/L as CaCO3	**20**	16.4	12.7	12.8	9.4	11.6	**23.3**	17	**27.3**	15.2	12	14.1
Field Parameters													
Conductivity	uS/cm	700	--	46.2	49.7	41.4	4.6	0.059	74.0	96.8	--	46.7	58.6
Dissolved Oxygen	mg/L	**9.5**	--	**12.14**	**10.59**	8.95	**14.08**	**11.63**	**12.72**	8.37	**10.35**	**12.92**	**--**
pH	pH units	**8.5**	--	**6.04**	7.4	6.91	6.86	6.81	6.94	7.03	7.25	7.16	6.86
Turbidity	NTU	**5**	--	**40.2**	**17**	**10.8**	**19.7**	**6.47**	**129.00**	**9.99**	**50.10**	1.94	**17.30**
Metals													
Dissolved Copper	mg/L	**0.0018**	0.0018	**0.0032 J**	**0.01 U**	**0.01 U**	**0.01 U**	**0.01 U**	**0.00541**	--	**0.00644 J**	**0.002 U**	**0.00504**
Total Copper	mg/L	**0.0018**	--	--	--	--	--	--	--	**0.0101**	**0.0075**	**0.00376**	--
Dissolved Iron	mg/L	1	0.467	0.721	0.537	0.196	0.489	0.453	0.272	0.495	0.538	0.266	0.336
Total Iron	mg/L	**1**	0.726	**2.24**	0.497	0.936	**1.2**	0.826	**2.41**	0.708	0.859	0.703	0.427
Dissolved Zinc	ug/L	21	5 U	4.4 UJ	20 U	20 U	20 U	20 U	3.5 U	--	9.42	3.8 U	4.99
Total Zinc	ug/L	21	--	--	--	--	--	--	--	19.4	13.3	7.79	--

Notes

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"--" - indicates results not available

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

mg/L = milligram per liter

ug/L = microgram per liter

Table 3-1. Summary of Compounds by Well Semiannual Groundwater Monitoring, 2012-2022

Project No. 120097, Bainbridge Island Landfill, Bainbridge Island, WA

Well ID	Analyte	Units	Number of Detections	Number of ND	Number of Samples	Frequency of Detections	Min ND Value	Max ND Value	Min Detect Value	Max Detect Value	5-Year Average Value	2001			2023			MTCA Method B		
												COBI-VLF (2001)	of ND > CUL	Detects > CUL	COBI-VLF (2023)	of ND > CUL	Detects > CUL	MTCA B GW	of ND > CUL	Detects > CUL
BMW-12																				
Conventionals	Alkalinity as Bicarbonate	mg/L as CaCO3	16	1	17	94%	2.5	2.5	46.8	68.2	54.2									
	Alkalinity, Total	mg/L as CaCO3	20		20	100%			46.8	70.2	**62.2**				20	0	20			
	Chloride	mg/L	21		21	100%			2.7	31.6	9.7	250								
	Nitrate as Nitrogen	mg/L as N	20		20	100%			0.8	3.38	1.48	10						26		
	Nitrate-Nitrite	mg/L as N	20		20	100%			0.72	3.6	1.4	10								
	Sulfate	mg/L	21		21	100%			6.7	9.8	7.9	250								
Field Parameters	Conductivity	uS/cm	15		15	100%			0.163	200	168				700					
	Dissolved Oxygen	mg/L	15		15	100%			8.12	91.9	9.6				9.5	0	13			
	pH	pH units	20		20	100%			5.61	7.9	6.9				8.5	0	3			
	Turbidity	NTU	20		20	100%			0.13	2.95	0.64				5					
Metals	Dissolved Iron	mg/L		9	9	0%	0.1	0.2			0.1	1			1			11		
	Dissolved Manganese	mg/L	2	22	24	8%	0.002	0.015	0.0023	0.0292	0.001	0.05			0.05			0.75		
	Total Iron	mg/L		3	3	0%	0.1	1			0.2	1			1			11		
	Total Manganese	mg/L	1	20	21	5%	0.002	0.015	0.0108	0.0108	0.002	0.05			0.05			0.75		
VOCs	1,1-Dichloroethene	ug/L		21	21	0%	0.0013	0.5			0.06	0.073	2	0	0.073	2	0	400		
	Vinyl Chloride	ug/L		22	22	0%	0.0042	0.2			**0.04**	0.023	4	0	0.023	4	0	0.029	4	0
BMW-13																				
Conventionals	Alkalinity as Bicarbonate	mg/L as CaCO3	17		17	100%			219	516	399.4									
	Alkalinity, Total	mg/L as CaCO3	20		20	100%			219	525	**418.6**				20	0	20			
	Chloride	mg/L	21		21	100%			5.13	10.4	7.1	250								
	Nitrate as Nitrogen	mg/L as N	15	5	20	75%	0.1	0.5	0.152	1.67	0.84	10						26		
	Nitrate-Nitrite	mg/L as N	17	3	20	85%	0.02	0.022	0.05	2.26	1.4	10								
	Sulfate	mg/L	21		21	100%			9.96	50.4	26.8	250								
Field Parameters	Conductivity	uS/cm	15		15	100%			0.72	984	608				700	0	4			
	Dissolved Oxygen	mg/L	17		17	100%			0.18	9.6	2.6				9.5	0	1			
	pH	pH units	20		20	100%			5.86	7.04	6.4				8.5	0	9			
	Turbidity	NTU	19		19	100%			0.02	1.05	0.61				5					
Metals	Dissolved Iron	mg/L		9	9	0%	0.1	0.2			0.1	1			1			11		
	Dissolved Manganese	mg/L	24		24	100%			1.28	5.62	**3.12**	0.05	0	24	0.05	0	24	0.75	0	24
	Total Iron	mg/L		3	3	0%	0.1	1			0.2	1			1			11		
	Total Manganese	mg/L	21		21	100%			1.31	6.39	**3.42**	0.05	0	21	0.05	0	21	0.75	0	21
VOCs	1,1-Dichloroethene	ug/L	1	20	21	5%	0.0013	0.5	0.01	0.01	0.06	0.073	2	0	0.073	2	0	400		
	Vinyl Chloride	ug/L	5	17	22	23%	0.0042	0.2	0.03	0.28	**0.04**	0.023	4	5	0.023	4	5	0.029	4	5
BMW-14																				
Conventionals	Alkalinity as Bicarbonate	mg/L as CaCO3	17		17	100%			261	409	360.4									
	Alkalinity, Total	mg/L as CaCO3	20		20	100%			284	410	**372.5**				20	0	20			
	Chloride	mg/L	21		21	100%			3.3	20.5	8.4	250								
	Nitrate as Nitrogen	mg/L as N	16	4	20	80%	0.1	1.0	0.1	6.2	0.19	10						26		
	Nitrate-Nitrite	mg/L as N	16	4	20	80%	0.1	0.1	0.02	7.6	0.1	10								
	Sulfate	mg/L	21		21	100%			16.9	65.5	27.6	250								
Field Parameters	Conductivity	uS/cm	15		15	100%			0.77	787	657				700	0	4			
	Dissolved Oxygen	mg/L	15		15	100%			0.16	9.6	3.1				9.5	0	1			
	pH	pH units	20		20	100%			4.3	7.01	6.2				8.5	0	9			
	Turbidity	NTU	19		19	100%			0.02	20.8	0.42				5	0	2			
Metals	Dissolved Iron	mg/L		9	9	0%	0.1	0.2			0.1	1			1			11		
	Dissolved Manganese	mg/L	23	1	24	96%	0.015	0.015	0.0129	0.0742	0.04	0.05	0	4	0.05	0	4	0.75		
	Total Iron	mg/L		3	3	0%	0.1	1			0.2	1			1			11		
	Total Manganese	mg/L	20	1	21	95%	0.015	0.015	0.0107	0.0726	0.05	0.05	0	4	0.05	0	4	0.75		
VOCs	1,1-Dichloroethene	ug/L	7	14	21	33%	0.0013	0.5	0.0112	0.03	0.07	0.073	2	0	0.073	2	0	400		
	Vinyl Chloride	ug/L	13	9	22	59%	0.0042	0.2	0.124	0.36	**0.15**	0.023	3	13	0.023	3	13	0.029	3	13

Table 3-1. Summary of Compounds by Well Semiannual Groundwater Monitoring, 2012-2022

Project No. 120097, Bainbridge Island Landfill, Bainbridge Island, WA

Well ID	Analyte	Units	Number of Detections	Number of ND	Number of Samples	Frequency of Detections	Min ND Value	Max ND Value	Min Detect Value	Max Detect Value	5-Year Average Value	2001			2023			MTCA Method B		
												COBI-VLF (2001)	of ND > CUL	Detects > CUL	COBI-VLF (2023)	of ND > CUL	Detects > CUL	MTCA B GW	of ND > CUL	Detects > CUL
BMW-15																				
Conventionals	Alkalinity as Bicarbonate	mg/L as CaCO3	14		14	100%			218	333	278.3									
	Alkalinity, Total	mg/L as CaCO3	17		17	100%			231	333	**293.8**				20	0	17			
	Chloride	mg/L	18		18	100%			4.92	27.4	22.1	250								
	Nitrate as Nitrogen	mg/L as N	14	3	17	82%	0.1	1	0.43	4	2.77	10						26		
	Nitrate-Nitrite	mg/L as N	17		17	100%			0.22	2.95	1.3	10								
	Sulfate	mg/L	18		18	100%			22.1	127	60.2	250								
Field Parameters	Conductivity	uS/cm	15		15	100%			0.83	877	**744**				700	0	2			
	Dissolved Oxygen	mg/L	15		15	100%			0.12	32.5	3.1				9.5	0	2			
	pH	pH units	20		20	100%			5.94	6.99	6.4				8.5	0	7			
	Turbidity	NTU	20		20	100%			0.02	20.8	0.48				5	0	1			
Metals	Dissolved Iron	mg/L		6	6	0%	0.1	0.2			0.1	1			1			11		
	Dissolved Manganese	mg/L	1	20	21	5%	0.0018	0.015	0.0076	0.0076	0.001	0.05			0.05			0.75		
	Total Iron	mg/L		3	3	0%	0.1	1			0.2	1			1			11		
	Total Manganese	mg/L	1	20	21	5%	0.002	0.015	0.002	0.002	0.002	0.05			0.05			0.75		
VOCs	1,1-Dichloroethene	ug/L		21	21	0%	0.0013	0.5			0.06	0.073	2	0	0.073	2	0	400		
	Vinyl Chloride	ug/L		22	22	0%	0.0042	0.2			**0.04**	0.023	4	0	0.023	4	0	0.029	4	0
BOW-37																				
Conventionals	Alkalinity as Bicarbonate	mg/L as CaCO3	13		13	100%			120	202	133.3									
	Alkalinity, Total	mg/L as CaCO3	16		16	100%			120	227	**136.5**				20	0	16			
	Chloride	mg/L	17		17	100%			3.7	6.09	5.6	250								
	Nitrate as Nitrogen	mg/L as N	16		16	100%			1.06	2.46	1.51	10						26		
	Nitrate-Nitrite	mg/L as N	17		17	100%			1.07	2.5	1.6	10								
	Sulfate	mg/L	17		17	100%			6.74	53.2	8.3	250								
Field Parameters	Conductivity	uS/cm	13		13	100%			0.319	444	294				700					
	Dissolved Oxygen	mg/L	15		15	100%			5.71	82.2	7.6				9.5	0	2			
	pH	pH units	18		18	100%			6.09	7.45	6.6				8.5	0	3			
	Turbidity	NTU	18		18	100%			0.02	1.42	0.56				5					
Metals	Dissolved Iron	mg/L		5	5	0%	0.1	0.2			0.1	1			1			11		
	Dissolved Manganese	mg/L	9	11	20	45%	0.002	0.015	0.0019	0.0113	0.002	0.05			0.05			0.75		
	Total Iron	mg/L		3	3	0%	0.1	1			0.2	1			1			11		
	Total Manganese	mg/L	5	15	20	25%	0.002	0.015	0.0046	0.0134	0.003	0.05			0.05			0.75		
VOCs	1,1-Dichloroethene	ug/L		20	20	0%	0.0013	0.5			0.066	0.073	2	0	0.073	2	0	400		
	Vinyl Chloride	ug/L	3	18	21	14%	0.0042	0.2	0.01	0.07	**0.04**	0.023	3	2	0.023	3	2	0.029	3	2

Notes:

1) Cleanup levels presented in the Cleanup Action Plan (Ecology, 2001) in March 2001
2) Cleanup levels proposed in the Second Five-Year Review Report (CH2MHill, 2011).
3) Most stringent model toxics control act (MTCA) method B cleanup levels for groundwater.
ND = sample result was not detected above the laboratory detection limit.
Min = minimum
Max = maximum
CUL = cleanup level
ORP = oxidation reduction potential
mg/L = milligram per liter
mv = millivolt
pH units = standard units of pH
µS/cm = microseimens per centimeter
deg C = degrees celcius
NTU = nephelometric turbidity units
CaCO3 = calcium carbonate
N = nitrogen
µg/L = micrograms per liter
VOCs = volatile organic compounds

Table 3-2. Summary of Compounds from Annual Surface Water Monitoring Points, 2012-2022

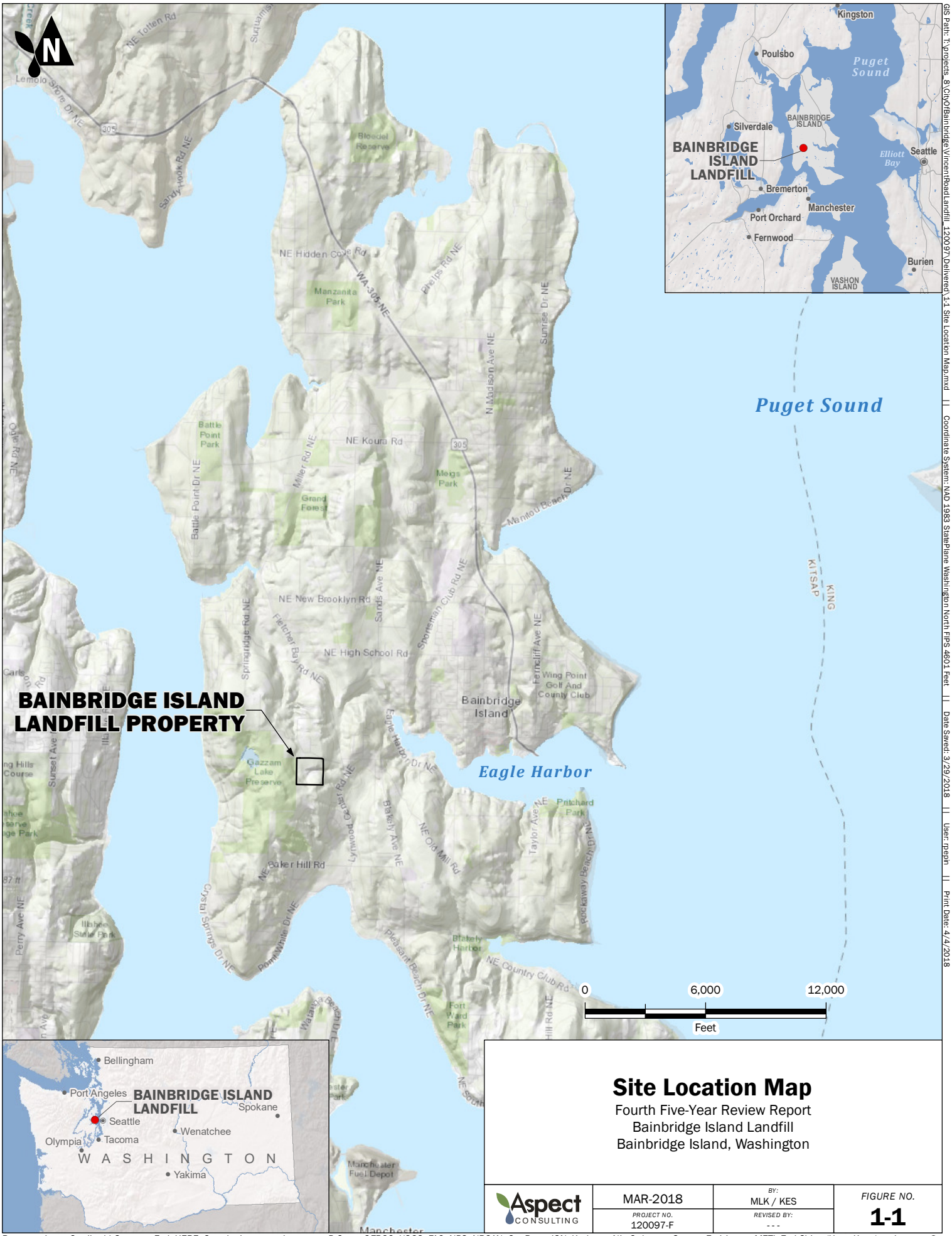
Project No. 120097, Bainbridge Island Landfill, Bainbridge Island, WA

Well ID	Analyte	Units	Number of Detections	Number of ND	Number of Samples	Frequency of Detections	Min ND Value	Max ND Value	Min Detection Value	Max Detection Value	5-Year Average Value	2001[1]			2023[2]			MTCA Method B[3]		
												CUL	of ND > CUL	Detects > CUL	CUL	of ND > CUL	Detects > CUL	CUL	of ND > CUL	Detects > CUL
SW-1U																				
Conventionals	Alkalinity as Bicarbonate	mg/L as CaCO3	5		5	100%			7.3	23.1										
	Alkalinity, Total	mg/L as CaCO3	10	1	11	91%	5	5	7.3	31.2	14.5				20	0	2			
Field Parameters	Conductivity	uS/cm	9		9	100%			0.06	90.8	64.75				700					
	Dissolved Oxygen	mg/L	9		9	100%			6.74	12.62	9.30				9.5	0	6			
	pH	pH units	10		10	100%			5.7	7.39	6.20				8.5	0	7			
	Turbidity	NTU	10		10	100%			7.3	33.5	20.74				5	0	10			
Metals	Dissoloved Copper	mg/L	3	7	10	30%	0.002	0.01	0.00146	0.0016	0.0014	0.0018	7	0	0.0018	7	0	0.64		
	Total Copper	mg/L	0	3	3	0%	0.002	0.002			0.00	0.0018	3	0	0.0018	3	0	0.64		
	Dissolved Iron	mg/L	11		11	100%			0.256	0.723	0.505	1			1			11		
	Total Iron	mg/L	11		11	100%			0.408	1.63	0.611	1	0	1	1	0	1	11		
	Dissolved Zinc	mg/L	2	8	10	20%	3.5	20	3.49	3.96	0.003	21			21			4800		
	Total Zinc	mg/L	3		3	100%			2.62	6.56	0.004	21			21			4800		
SW-4D																				
Conventionals	Alkalinity as Bicarbonate	mg/L as CaCO3	5		5	100%			9.4	23.3										
	Alkalinity, Total	mg/L as CaCO3	11		11	100%			9.4	27.3	17.1				20	0	2			
Field Parameters	Conductivity	uS/cm	9		9	100%			0.059	96.8	69.03				700					
	Dissolved Oxygen	mg/L	9		9	100%			8.37	14.08	11.09				9.5	0	7			
	pH	pH units	10		10	100%			6.04	7.4	7.05				8.5	0	1			
	Turbidity	NTU	10		10	100%			1.94	129	41.67				5	0	9			
Metals	Dissoloved Copper	mg/L	5	5	10	50%	0.002	0.01	0.0018	0.00644	0.0045	0.0018	5	4	0.0018	5	4	0.64		
	Total Copper	mg/L	3		3	100%			0.00376	0.0101	0.01	0.0018	0	3	0.0018	0	3	0.64		
	Dissolved Iron	mg/L	11		11	100%			0.196	0.721	0.381	1			1			11		
	Total Iron	mg/L	11		11	100%			0.427	2.41	1.021	1	0	3	1	0	3	11		
	Dissolved Zinc	mg/L	2	8	10	20%	3.5	20	4.99	9.42	0.005	21			21			4800		
	Total Zinc	mg/L	3		3	100%			7.79	19.4	0.013	21			21			4800		

Notes

1) Cleanup levels presented in the Cleanup Action Plan (Ecology, 2001) in March 2001
2) Cleanup levels proposed in the Second Five-Year Review Report (CH2MHill, 2011).
3) Most stringent model toxics control act (MTCA) method B cleanup levels for surface water.
ND = sample result was not detected above the laboratory detection limit.
Min = minimum
Max = maximum
CUL = cleanup level
ORP = oxidation reduction potential
mg/L = milligram per liter
mv = millivolt
pH units = standard units of pH
µS/cm = microseimens per centimeter
deg C = degrees celcius
NTU = nephelometric turbidity units
CaCO3 = calcium carbonate
N = nitrogen
µg/L = micrograms per liter

FIGURES



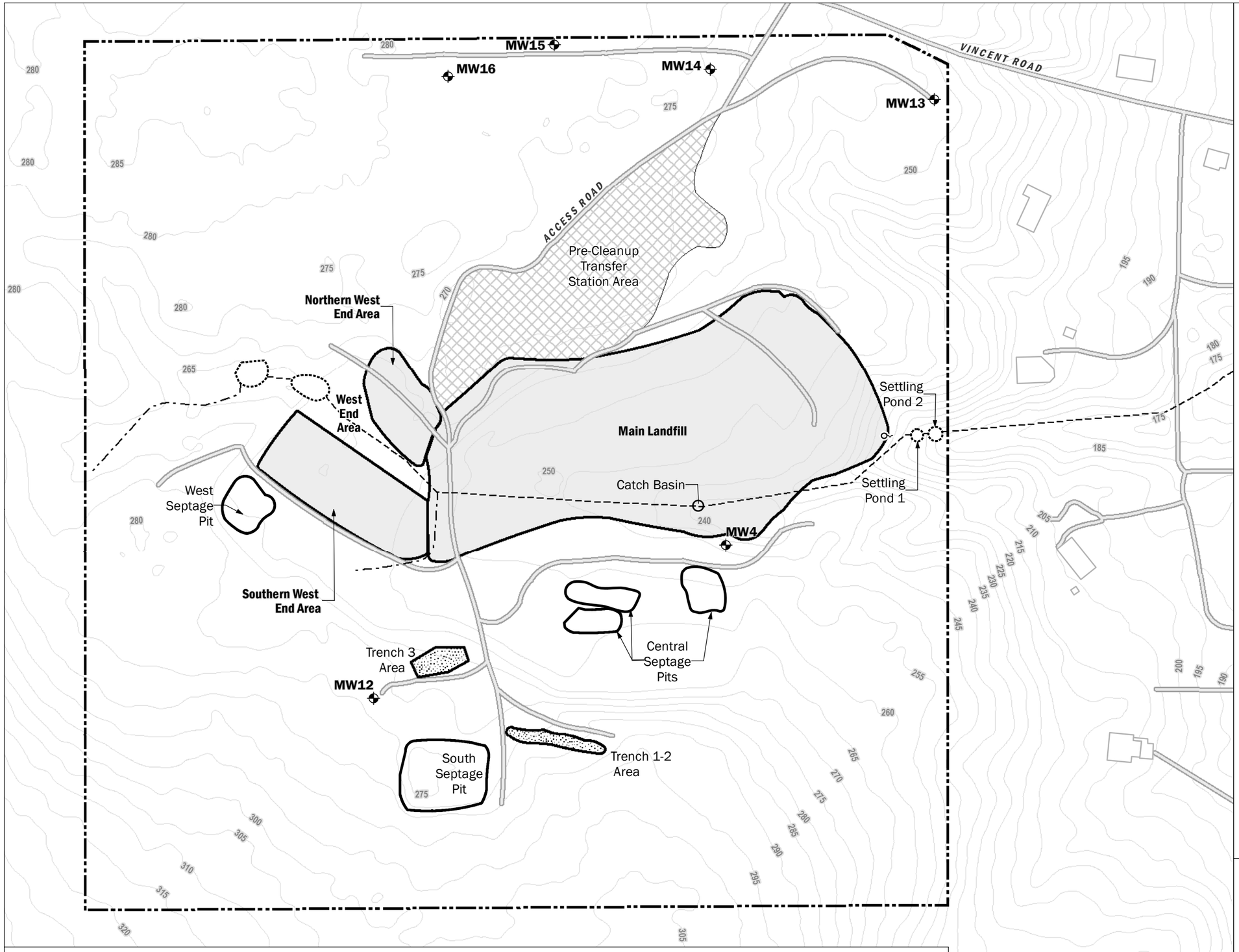
Site Location Map

Fourth Five-Year Review Report
Bainbridge Island Landfill
Bainbridge Island, Washington

Aspect CONSULTING	MAR-2018	BY: MLK / KES	FIGURE NO. 1-1
	PROJECT NO. 120097-F	REVISED BY: ---	

Basemap Layer Credits | | Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
Copyright:© 2014 Esri

GIS Path: T:\projects_8\Cities\Bainbridge\Vincent Road Landfill_120097\Delivered\1-1 Site Location Map.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 3/29/2018 || User: mepin || Print Date: 4/4/2018



Monitoring Well

Approximate Outline of Waste Source Area

Approximate Outline of Main Landfill Mass

Surface Water Drainage Channel

Approximate Location of Surface Water Diversion Pipe (Buried)

Approximate Outline of Pond

Gravel or Paved Road

Leachate Seep

Existing Structure

Property Boundary

N

0 150 300

Feet

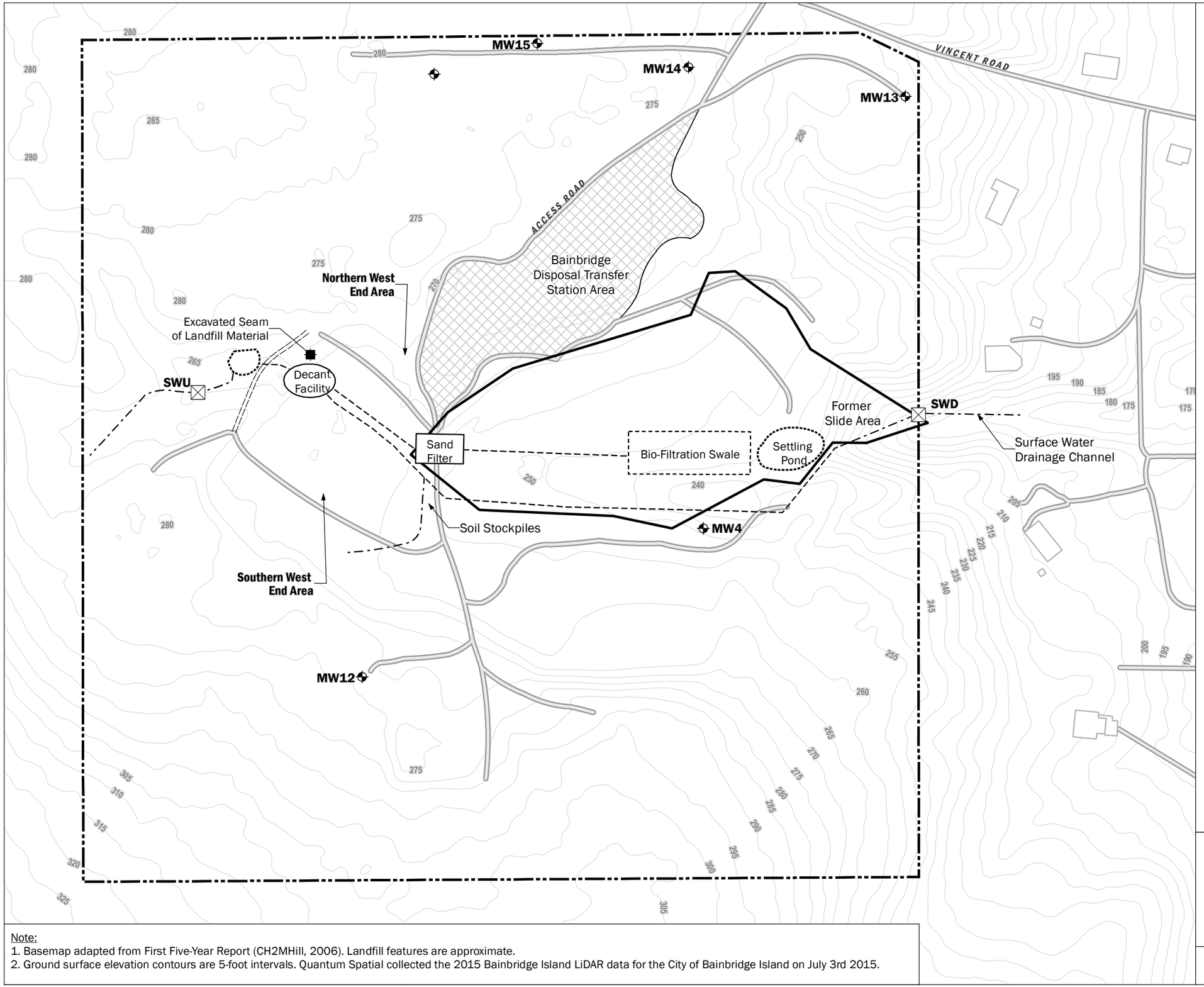
Note:
1. Basemap adapted from First Five-Year Review Report (CH2MHill, 2006). Landfill features are approximate.
2. Ground surface elevation contours are 5-foot intervals. Quantum Spatial collected the 2015 Bainbridge Island LiDAR data for the City of Bainbridge Island on July 3rd 2015.
3. Elevations are in NAVD88, ft.

Site Plan
(Pre-Cleanup Condition)

Fourth Five-Year Review Report
Bainbridge Island Landfill
Bainbridge Island, Washington

Aspect CONSULTING	APR-2018	BY: MLK / KES	FIGURE NO. 1-2
	PROJECT NO. 120097-F	REVISED BY: ---	

GIS Path: T:\projects_8\City\Bainbridge\VincentRoad\Landfill_120097\Deliverech\1-3 Site Plan (Pre-Cleanup Condition).mxd || Coordinate System: NAD_1983_StatePlane_Washington_North_FIPS_4601_Feet || Date Saved: 4/4/2018 || User: rpepin || Print Date: 4/4/2018



Monitoring Well

Surface Water Sampling Location

Surface Water Drainage Channel

Approximate Location of Surface Water Diversion Pipe (Buried)

Property Boundary

Approximate Outline of Final Cover Based on Design Limits

Approximate Outline of Pond

Gravel or Paved Road

Existing Structure

N

0 150 300

Feet

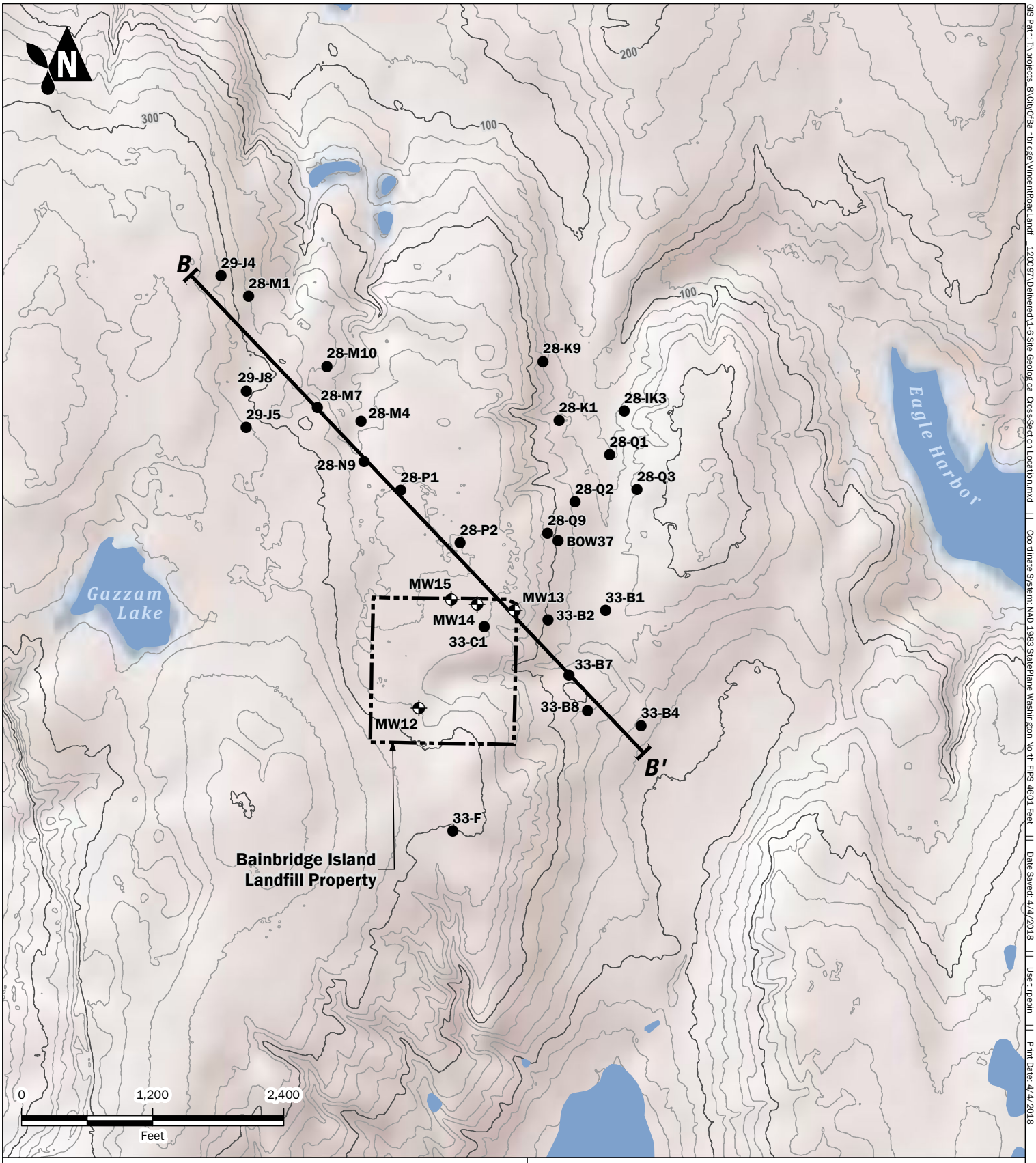
Note:
1. Basemap adapted from First Five-Year Report (CH2MHill, 2006). Landfill features are approximate.
2. Ground surface elevation contours are 5-foot intervals. Quantum Spatial collected the 2015 Bainbridge Island LiDAR data for the City of Bainbridge Island on July 3rd 2015.

Site Plan
(Post-Cleanup Condition)

Fourth Five-Year Review Report
Bainbridge Island Landfill
Bainbridge Island, Washington

PROJECT NO.			FIGURE NO.
120097-F	Aspect CONSULTING	MAR-2018 BY: MLK / KES	1-3

GIS Path: T:\projects_8\City\Bainbridge\VincentRoadLandfill_120097\Delivered\1-4 Site Plan (Post-Cleanup Condition).mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 3/29/2018 || User: rpejin || Print Date: 3/29/2018



Approximate Monitoring Well Location

Approximate Domestic Well Location

Cross Section B-B'

Note:
1. Features adapted from First Five-Year Review Report (CH2MHill, 2006).
2. Topographic contours derived from 2015 Bainbridge Island LiDAR project, in NAVD88, ft.

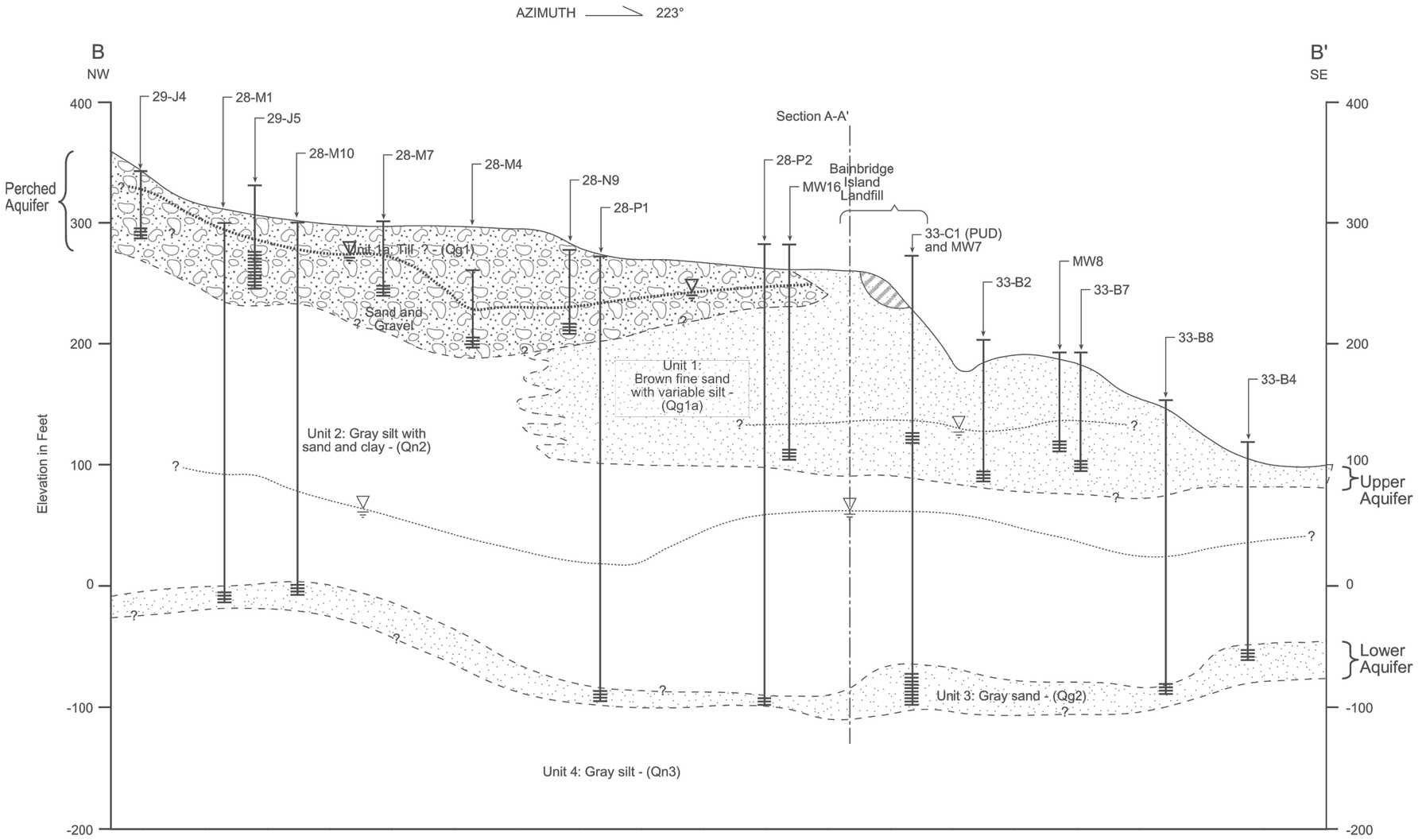
Site Geologic Cross-Section Location

Fourth Five-Year Review Report
Bainbridge Island Landfill
Bainbridge Island, Washington

Aspect CONSULTING	APR-2018	BY: MLK / KES	FIGURE NO. 2-1
	PROJECT NO. 120097-F	REVISED BY: ---	

Basemap Layer Credits || Copyright:© 2014 Esri

GIS Path: T:\projects_8\City\Bainbridge\VincentRoad Landfill_120097\Delivered\1-6 Site Geological Cross-Section Location.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 4/4/2018 || User: rpepin || Print Date: 4/4/2018



Source: This cross section and all subsurface data are from the *First Five-Year Review Report* by CH2MHill, 2006.

LEGEND

- 33-F1 — Well ID
- Potentiometric surface as reported on well log (depth)
- Well screen interval
- Water bearing zone

Note: For well locations, see Figure 1-6.

Horizontal Scale: 1" = 600'
Vertical Scale: 1" = 100'
Vertical Exaggeration 6x

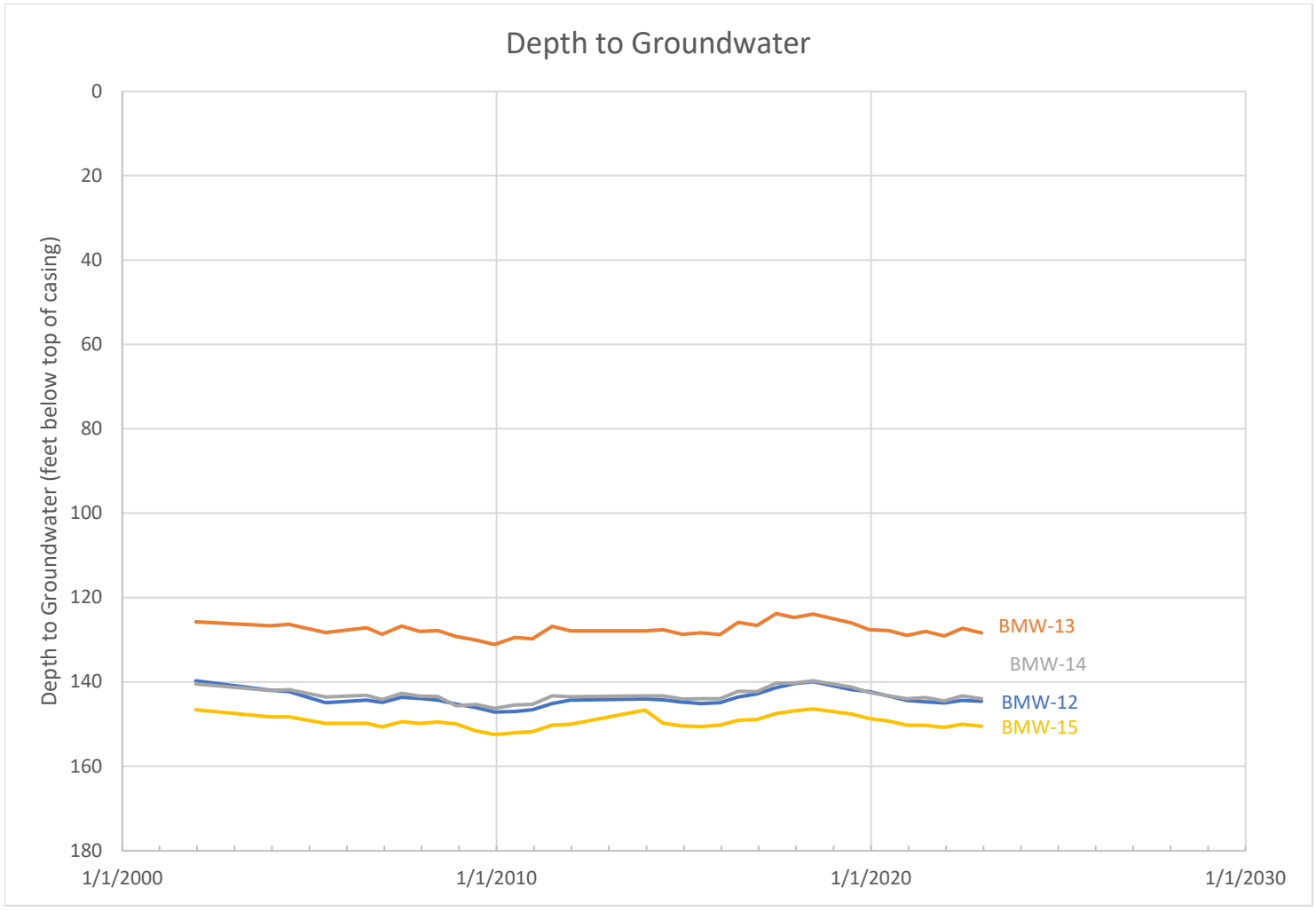
0 600 1200 Feet

Site Geologic Cross Section B-B'

Fourth Five-Year Review Report
Bainbridge Island Landfill
Bainbridge Island, Washington

Aspect CONSULTING	Mar-2018	BY: MBK/SCC	FIGURE NO. 2-2
	PROJECT NO. 120097-F	REVISED BY: -	

CAD Path: Q:\City of Bainbridge\120097 Vincent Road Landfill\2018-03 5-Year Review Report\120097-AA.dwg Cross Section B-B' CH2MHill || Date Saved: Mar 29, 2018 2:48pm || User: scudd



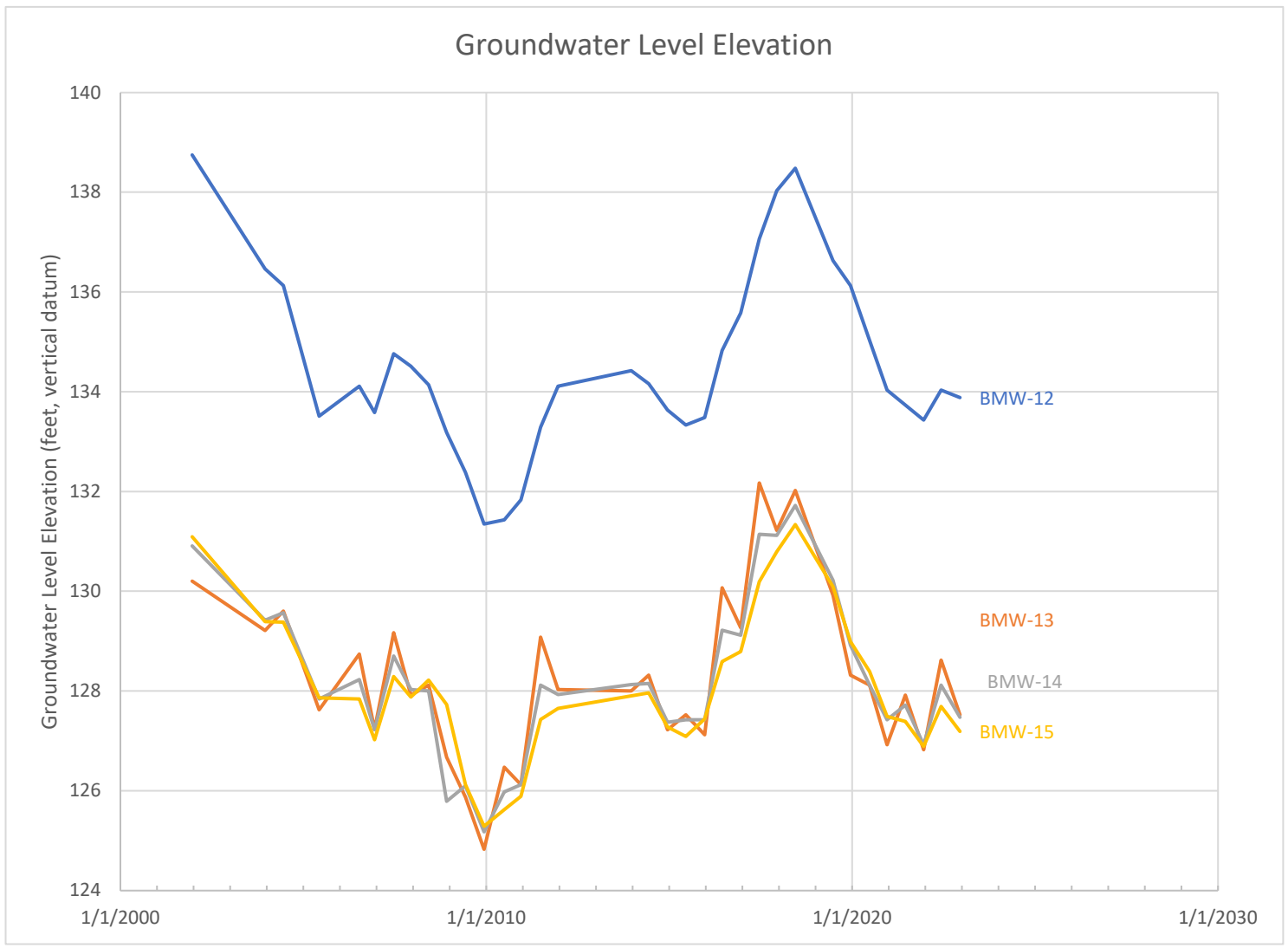
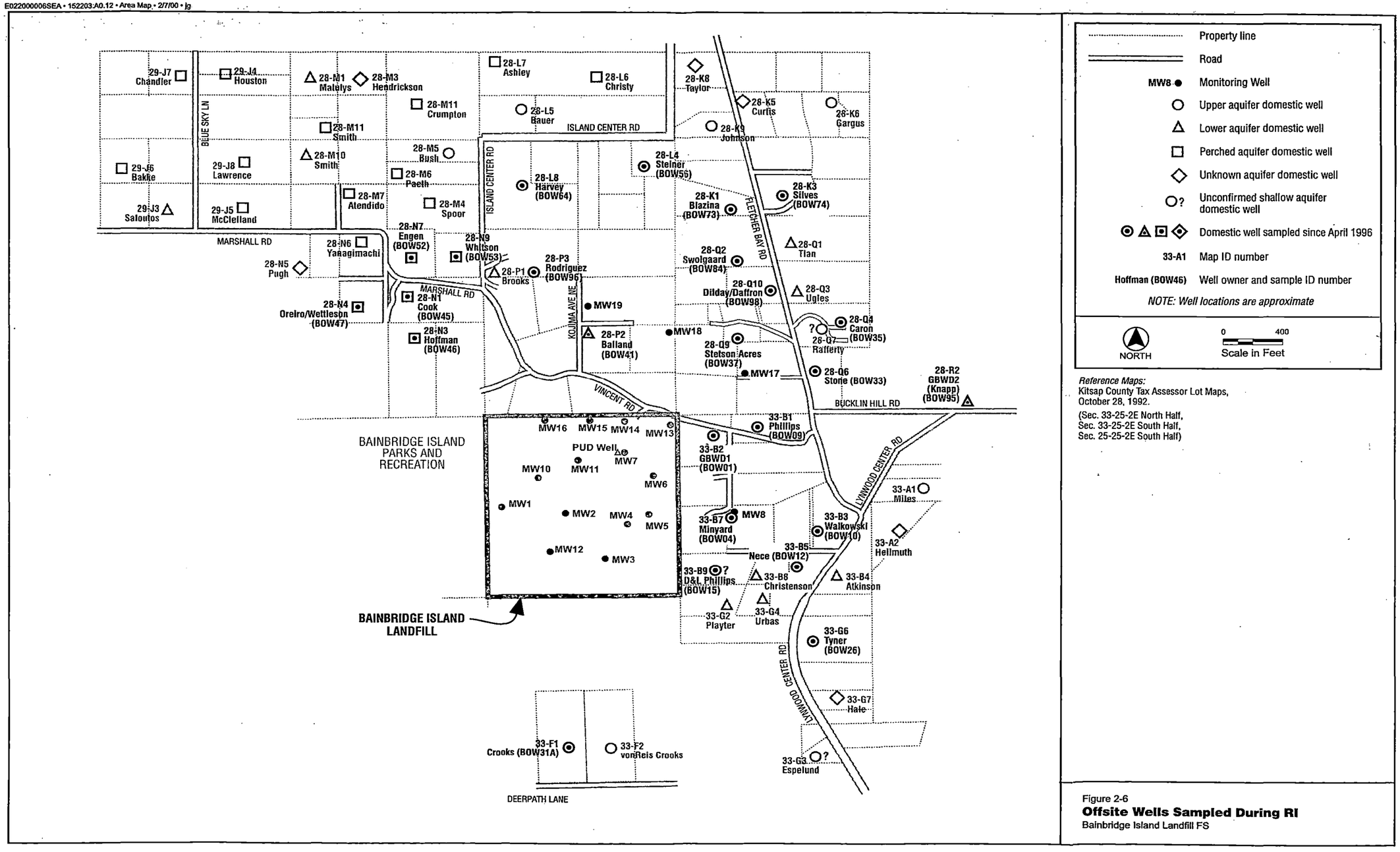


Figure 2-3
Monitoring Well Groundwater Elevation Data
Fourth Five-Year Review Report
Bainbridge Island, WA

Aspect Consulting
10/31/2023
V:\120097 COBI - Vincent Road Landfill\Deliverables\Fourth 5 Year Review Report\CLIENT DRAFT\Tables\Table 2-1 and Figure 2-3

E022000006SEA • 152203:A0.12 • Area Map • 2/7/00 • jg



Reference Maps:
Kitsap County Tax Assessor Lot Maps,
October 28, 1992.
(Sec. 33-25-2E North Half,
Sec. 33-25-2E South Half,
Sec. 25-25-2E South Half)

Figure 2-6
Offsite Wells Sampled During RI
Bainbridge Island Landfill FS

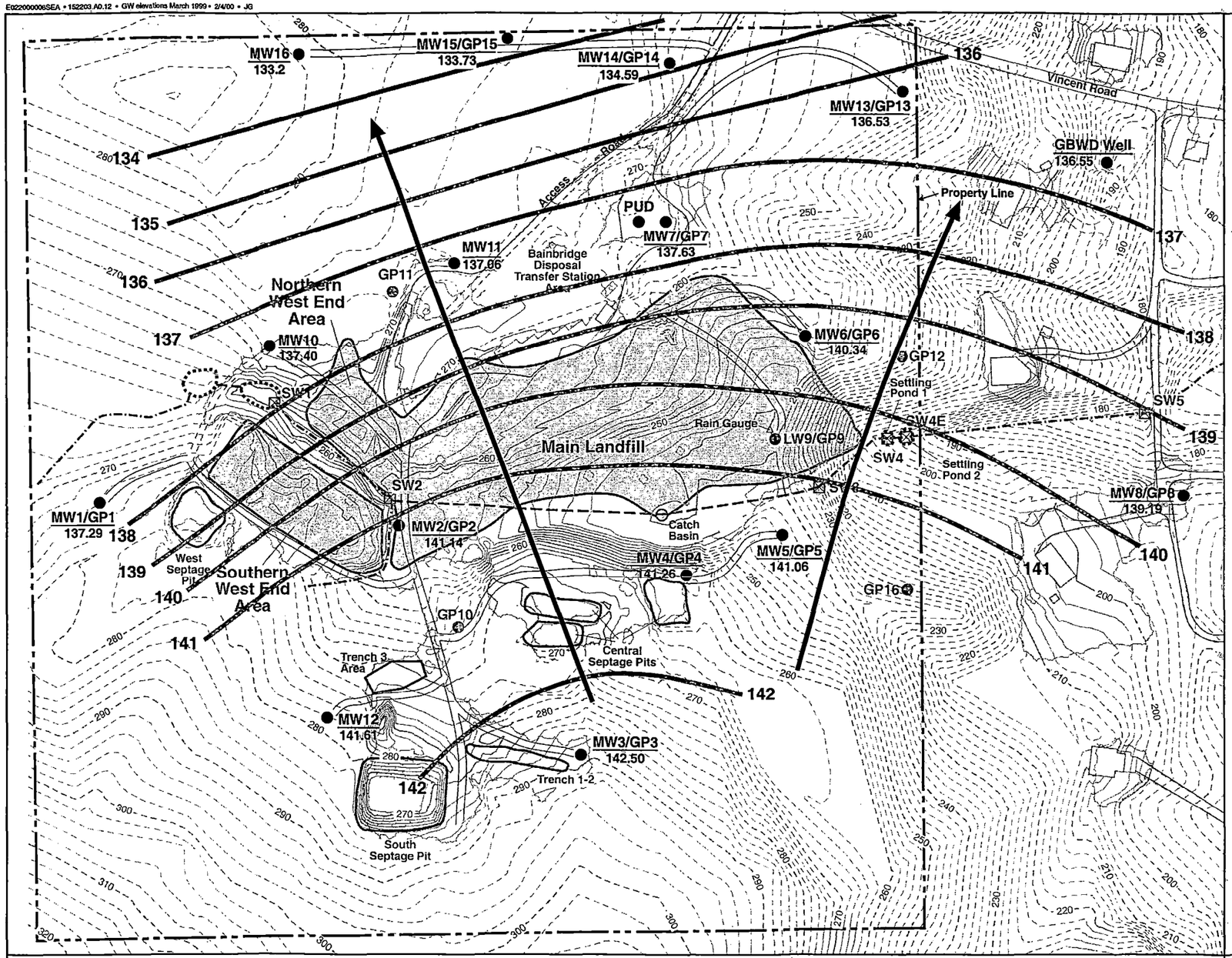
Aspect Consulting
10/31/2023
V:\120097 COBI - Vincent Road Landfill\Deliverables\Fourth 5 Year Review Report\CLIENT DRAFT\Figures\Figure2-4

Figure 2-4
Off-Site Wells Sampled During RI
Fourth Five-Year Review Report
Bainbridge Island, WA

APPENDIX A

Groundwater Potentiometric Surface Maps

E022000006SEA • 152203.A0.12 • GW elevations March 1999 • 2/4/00 • JG



LEGEND

- MW6/GP6 / 132.36 — Combination monitoring well and gas probe; Groundwater elevation (feet NGVD)
- MW12 — Monitoring well
- Approximate extent of main landfill mass
- 134 — Groundwater elevation contour
- Groundwater flow direction

Scale: 1" = 150'
0 50 100 150

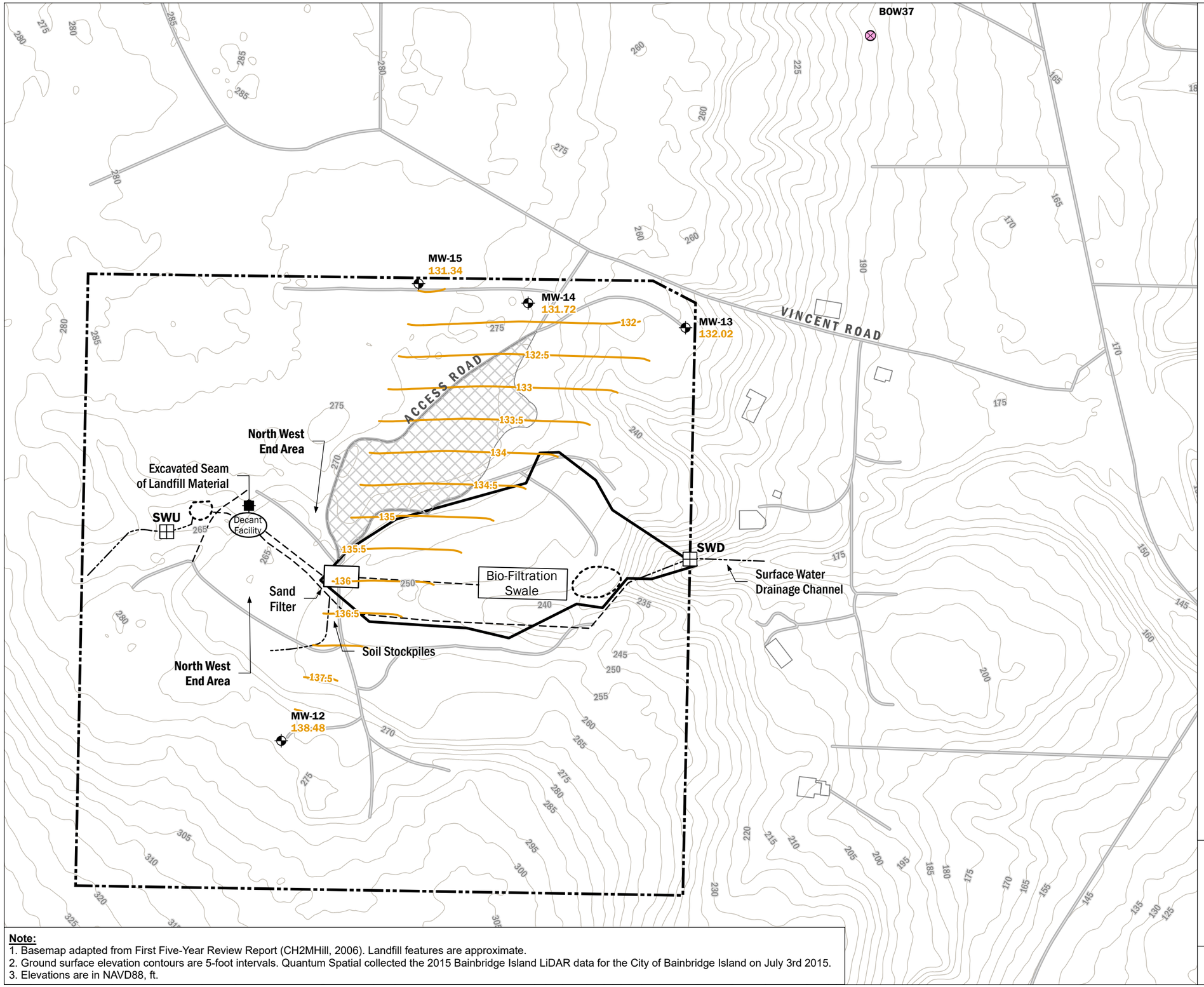
N

Note: Outlines of waste areas and transfer station are approximate.

Figure 2-5
Groundwater Elevations, March 1999
Bainbridge Island Landfill FS

Note: Reproduced from the Bainbridge Island Landfill Feasibility Study (CH2MHill, 2001).

Figure A-1
Groundwater Elevations, March 1999
Fourth Five-Year Review Report
Bainbridge Island, WA



Well Name
MW-15
June Water Elevation (ft) 131.34
Monitoring Well

- Domestic Well
- Monitoring Well
- Surface Water Sampling Location
- June 2018 Groundwater Elevation Contour
- Water Diversion Pipe
- Surface Water Drainage Channel
- Bainbridge Island Landfill Property
- Bainbridge Disposal Transfer Station Area
- Approximate Outline of Final Cover Based on Design Limits
- Approximate Outline of Pond
- Existing Structure
- Gravel or Paved Road

N

0 250 500
Feet

Note:
1. Basemap adapted from First Five-Year Review Report (CH2MHill, 2006). Landfill features are approximate.
2. Ground surface elevation contours are 5-foot intervals. Quantum Spatial collected the 2015 Bainbridge Island LiDAR data for the City of Bainbridge Island on July 3rd 2015.
3. Elevations are in NAVD88, ft.

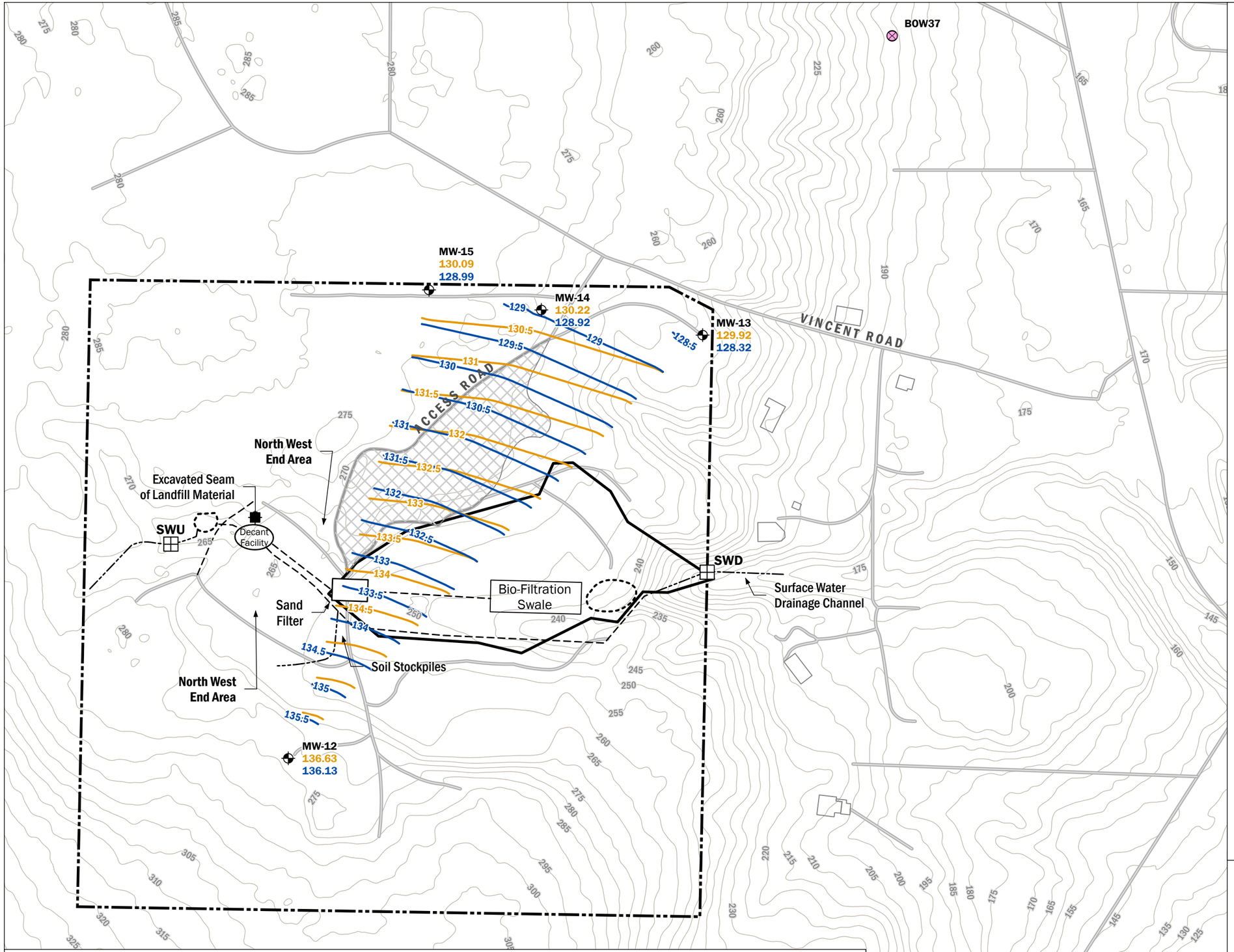
Data source credits: None || Basemap Service Layer Credits: NA

2018 Groundwater Contour Map

Fourth Five-Year Review Report
Bainbridge Island Landfill
Bainbridge Island, Washington

Aspect Consulting	SEP-2023	BY: MML / HMD	FIGURE NO. A-2
	PROJECT NO. 120097	REVISED BY: ---/---	

GIS Path: G:\projects\VincentRoadLandfill_120097\VincentRoadLandfill_120097.aprx; Groundwater Contour Map_2018 | User: hduran | | Print Date: 9/27/2023



Note:
1. Basemap adapted from First Five-Year Review Report (CH2MHill, 2006). Landfill features are approximate.
2. Ground surface elevation contours are 5-foot intervals. Quantum Spatial collected the 2015 Bainbridge Island LiDAR data for the City of Bainbridge Island on July 3rd 2015.
3. Elevations are in NAVD88, ft.

Data source credits: None || Basemap Service Layer Credits: NA

Well Name → MW-15 Monitoring Well
June Water Elevation (ft) → 130.09
December Water Elevation (ft) → 128.99

- Domestic Well
- Monitoring Well
- Surface Water Sampling Location
- December 2019 Groundwater Elevation Contour
- June 2019 Groundwater Elevation Contour
- Water Diversion Pipe
- Surface Water Drainage Channel
- Bainbridge Island Landfill Property
- Bainbridge Disposal Transfer Station Area
- Approximate Outline of Final Cover Based on Design Limits
- Approximate Outline of Pond
- Existing Structure
- Gravel or Paved Road

N

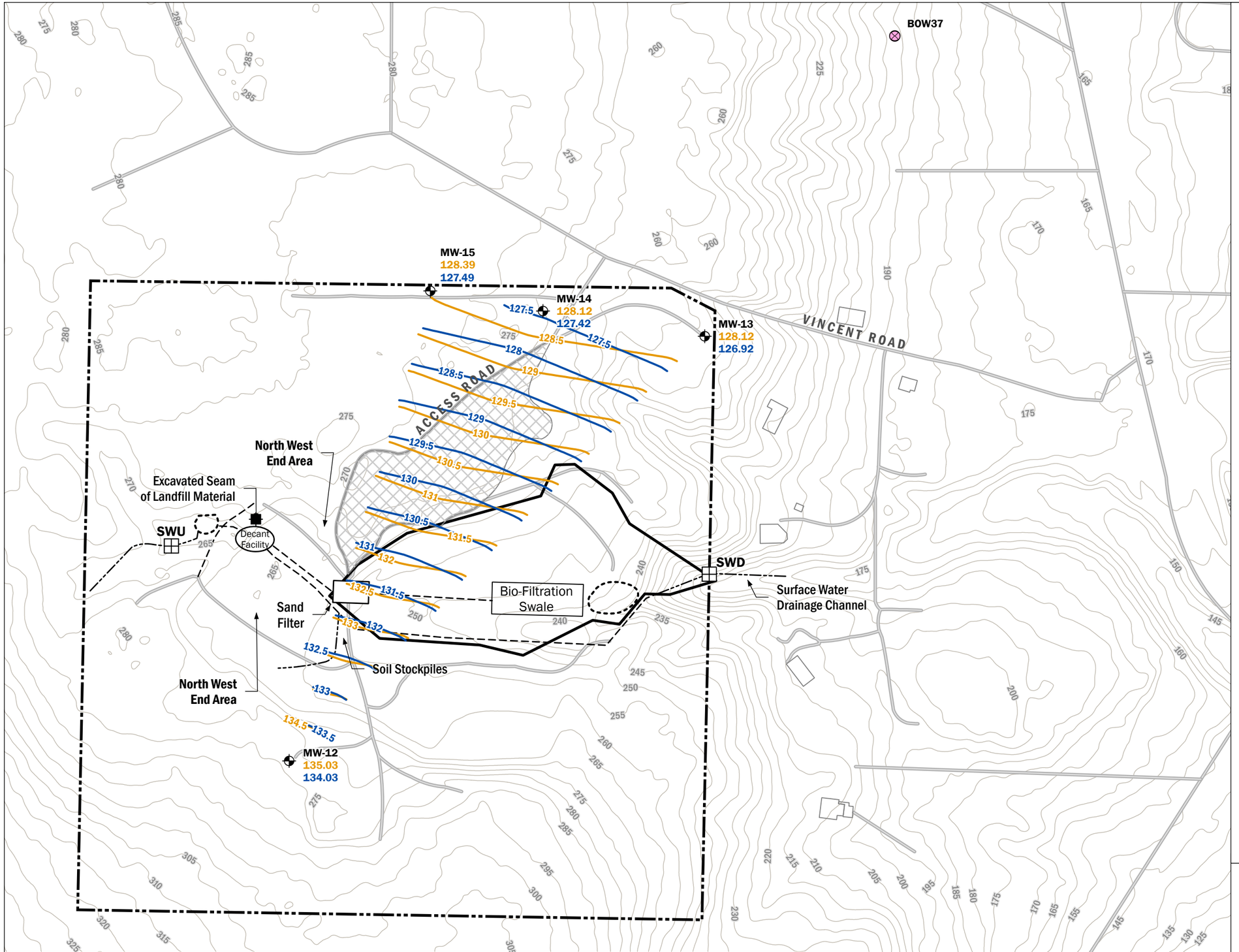
0 250 500 Feet

2019 Groundwater Contour Map

Fourth Five-Year Review Report
Bainbridge Island Landfill
Bainbridge Island, Washington

Aspect Consulting	SEP-2023	BY: MML / HMD	FIGURE NO. A-3
	PROJECT NO. 120097	REVISED BY: ---/---	

GIS Path: G:\projects\VincentRoad\Landfill_120097\VincentRoadLandfill_120097.aprx: Groundwater Contour Map_2019 | User: hduran | | Print Date: 9/27/2023



Well Name → MW-15 ◈ Monitoring Well
June Water Elevation (ft) → 128.39
December Water Elevation (ft) → 127.49

- Domestic Well
- Monitoring Well
- Surface Water Sampling Location
- December 2020 Groundwater Elevation Contour
- June 2020 Groundwater Elevation Contour
- Water Diversion Pipe
- Surface Water Drainage Channel
- Bainbridge Island Landfill Property
- Bainbridge Disposal Transfer Station Area
- Approximate Outline of Final Cover Based on Design Limits
- Approximate Outline of Pond
- Existing Structure
- Gravel or Paved Road

N

0 250 500 Feet

Note:
1. Basemap adapted from First Five-Year Review Report (CH2MHill, 2006). Landfill features are approximate.
2. Ground surface elevation contours are 5-foot intervals. Quantum Spatial collected the 2015 Bainbridge Island LiDAR data for the City of Bainbridge Island on July 3rd 2015.
3. Elevations are in NAVD88, ft.

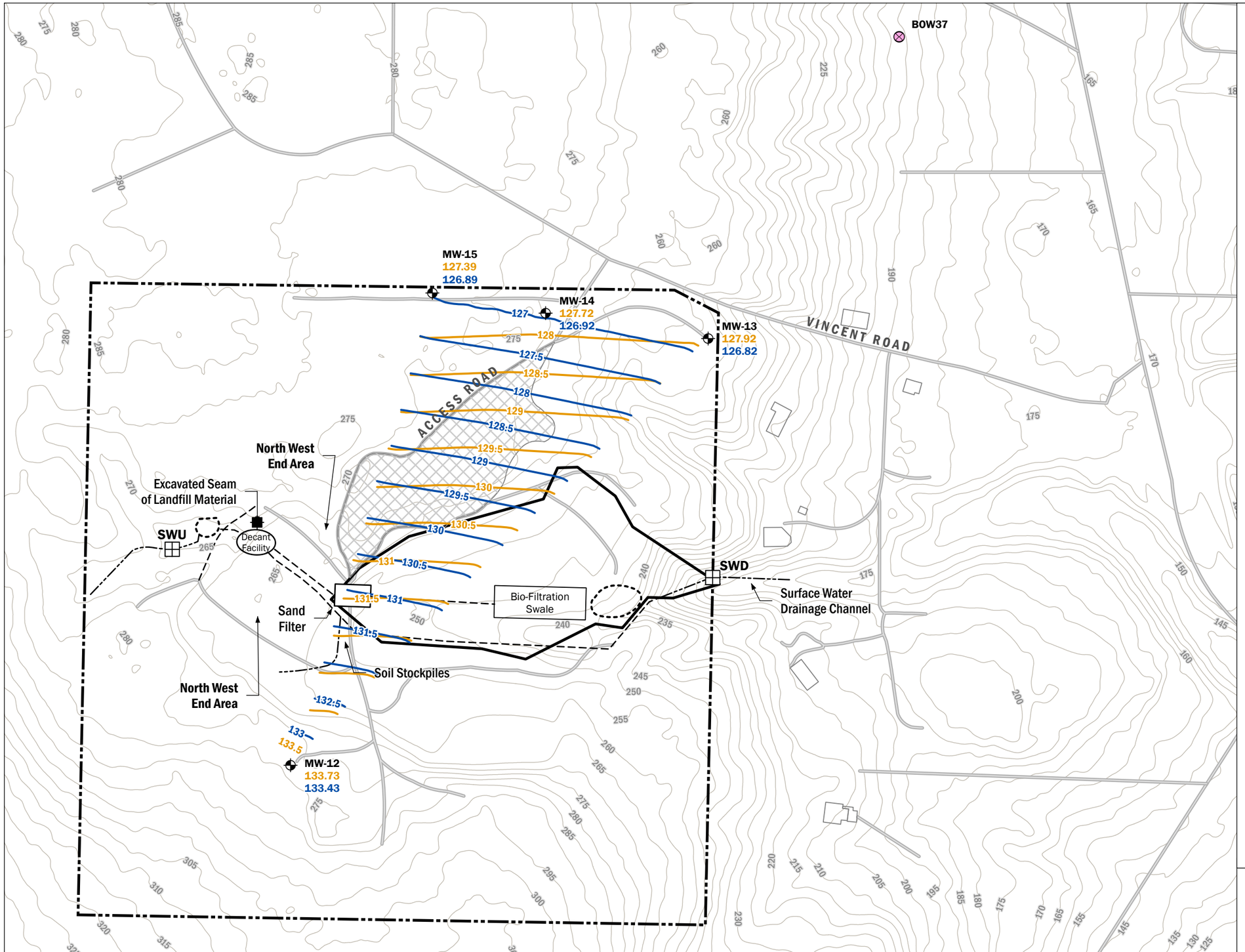
2020 Groundwater Contour Map

Fourth Five-Year Review Report
Bainbridge Island Landfill
Bainbridge Island, Washington

Aspect Consulting	SEP-2023	BY: MML / HMD	FIGURE NO. A-4
	PROJECT NO. 120097	REVISED BY: ---/---	

Data source credits: None | | Basemap Service Layer Credits: NA

GIS Path: G:\projects\VincentRoad\Landfill_120097\VincentRoadLandfill_120097.aprx: Groundwater Contour Map_2020 | User: hduran | | Print Date: 9/27/2023



Well Name → MW-15 Monitoring Well
June Water Elevation (ft) → 127.39
December Water Elevation (ft) → 126.89

- Domestic Well
- Monitoring Well
- Surface Water Sampling Location
- December 2021 Groundwater Elevation Contour
- June 2021 Groundwater Elevation Contour
- Water Diversion Pipe
- Surface Water Drainage Channel
- Bainbridge Island Landfill Property
- Bainbridge Disposal Transfer Station Area
- Approximate Outline of Final Cover Based on Design Limits
- Approximate Outline of Pond
- Existing Structure
- Gravel or Paved Road

N

0 250 500 Feet

Note:
1. Basemap adapted from First Five-Year Review Report (CH2MHill, 2006). Landfill features are approximate.
2. Ground surface elevation contours are 5-foot intervals. Quantum Spatial collected the 2015 Bainbridge Island LiDAR data for the City of Bainbridge Island on July 3rd 2015.
3. Elevations are in NAVD88, ft.

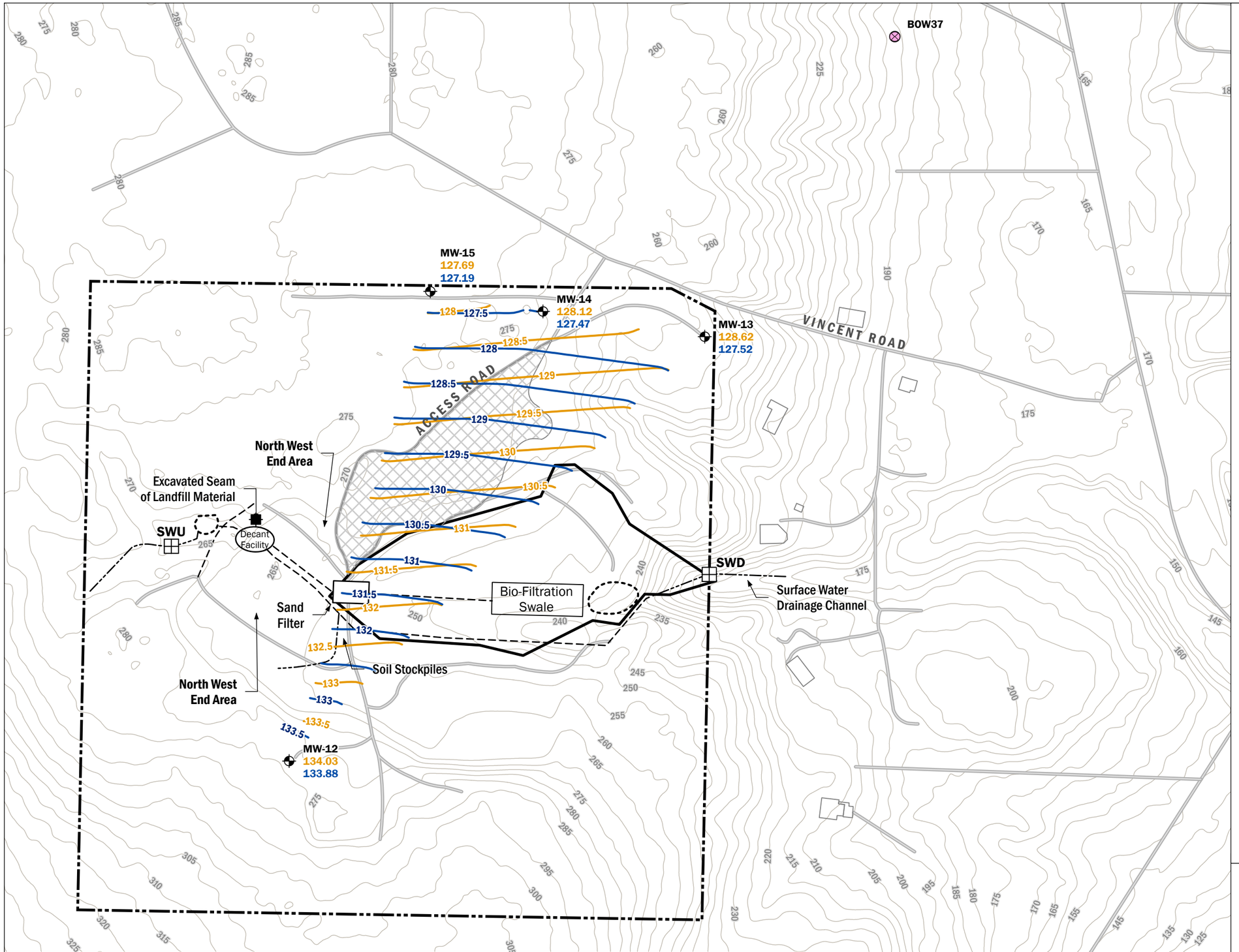
Data source credits: None | | Basemap Service Layer Credits: NA

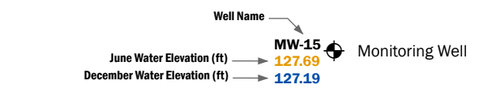
2021 Groundwater Contour Map

Fourth Five-Year Review Report
Bainbridge Island Landfill
Bainbridge Island, Washington

Aspect Consulting	SEP-2023	BY: MML / HMD	FIGURE NO. A-5
	PROJECT NO. 120097	REVISED BY: ---/---	

GIS Path: G:\projects\VincentRoad\Landfill_120097\VincentRoadLandfill_120097.aprx: Groundwater Contour Map_20211 | User: hduran | | Print Date: 9/27/2023





- Domestic Well
- Monitoring Well
- Surface Water Sampling Location
- December 2022 Groundwater Elevation Contour
- June 2022 Groundwater Elevation Contour
- Water Diversion Pipe
- Surface Water Drainage Channel
- Bainbridge Island Landfill Property
- Bainbridge Disposal Transfer Station Area
- Approximate Outline of Final Cover Based on Design Limits
- Approximate Outline of Pond
- Existing Structure
- Gravel or Paved Road

N

0 250 500 Feet

Note:
1. Basemap adapted from First Five-Year Review Report (CH2MHill, 2006). Landfill features are approximate.
2. Ground surface elevation contours are 5-foot intervals. Quantum Spatial collected the 2015 Bainbridge Island LiDAR data for the City of Bainbridge Island on July 3rd 2015.
3. Elevations are in NAVD88, ft.

2022 Groundwater Contour Map

Fourth Five-Year Review Report
Bainbridge Island Landfill
Bainbridge Island, Washington

Aspect Consulting	SEP-2023	BY: MML / HMD	FIGURE NO. A-6
	PROJECT NO. 120097	REVISED BY: ---/---	

Data source credits: None || Basemap Service Layer Credits: NA

GIS Path: G:\projects\Vincent\Road\Landfill_120097\Vincent\Road\Landfill_120097.aprx; Groundwater Contour Map_2022 | User: hduran | | Print Date: 9/27/2023

APPENDIX B

Kitsap County Public Health Letter
Summaries of Annual Landfill Inspections

KITSAP PUBLIC
HEALTH DISTRICT

345 6th Street, Suite 300
Bremerton, WA 98337
360-728-2235

February 6, 2019

Charles Krumheuer
Public Works Manager
280 Madison Avenue North
Bainbridge Island, WA 98110-1812

RE: 2018 ANNUAL BAINBRIDGE ISLAND DECANT FACILITY SITE INSPECTION

Dear Mr. Krumheuer:

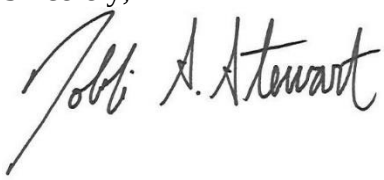
The Health District is writing you to inform you of the results of the annual inspection of the Bainbridge Island Decant site that was conducted on November 6, 2018. During the inspection it was noted the facility was in substantial compliance with state and local solid waste regulations.

The inspection form used to perform the inspection is included with this letter, with some notes on my observations. I highlighted those areas on the form that I was not able to obtain the information needed for the inspection. Perhaps we can arrange a date and time to review those highlighted areas.

I also noticed that last years (2017) annual inspection was addressed to Ray Naverette, the Operations & Maintenance Manager. The mailing address for Mr. Naverette is 7305 Hidden Cove Rd. NE. Is this information still valid, and would you prefer future correspondences be sent to Mr. Naverette if valid?

Please contact me to arrange a meeting regarding the 2018 inspection, and questions about the correct contact.

Sincerely,



Tobbi Stewart
Environmental Health Specialist
Solid and Hazardous Waste Program
360-728-2236 phone
tobbi.stewart@kitsappublichealth.org

KITSAP PUBLIC
HEALTH DISTRICT

345 6th Street, Suite 300
Bremerton, WA 98337
360-728-2235

November 6, 2019

Ray Navarette
Operations & Maintenance Manager
7305 Hidden Cove Rd. NE
Bainbridge Island, WA 98110-1812

RE: 2019 ANNUAL BAINBRIDGE ISLAND DECANT FACILITY SITE INSPECTION

Dear Mr. Navarette:

The Health District is writing you to inform you of the results of the annual inspection of the Bainbridge Island Decant site that was conducted on November 6, 2019. During the inspection it was noted the facility was in compliance with state and local solid waste regulations. The inspection form used to perform the inspection is included with this letter, with some notes on my observations.

Please contact me if you have any questions.

Sincerely,

Brian Burchett
Environmental Health Specialist
Solid and Hazardous Waste Program
360-728-2307 phone
brian.burchett@kitsappublichealth.org

KITSAP PUBLIC
HEALTH DISTRICT

345 6th Street, Suite 300
Bremerton, WA 98337
360-728-2235

February 22, 2021

Ray Navarette
Operations & Maintenance Manager
7305 Hidden Cove Rd. NE
Bainbridge Island, WA 98110-1812

RE: 2021 ANNUAL BAINBRIDGE ISLAND DECANT FACILITY SITE INSPECTION

Dear Mr. Navarette:

The Health District is writing you to inform you of the results of the annual inspection of the Bainbridge Island Decant site that was conducted on February 17, 2021. During the inspection it was noted the facility was in compliance with state and local solid waste regulations. The inspection form used to perform the inspection is included with this letter, with some notes on my observations.

Reminder only: please submit 2020 annual report by April 1st, 2021.

Please contact me if you have any questions.

Sincerely,

Brian Burchett
Environmental Health Specialist
Solid and Hazardous Waste Program
360-728-2307 phone
brian.burchett@kitsappublichealth.org

KITSAP PUBLIC
HEALTH DISTRICT

345 6th Street, Suite 300
Bremerton, WA 98337
360-728-2235

March 15, 2022

Ray Navarette
Operations & Maintenance Manager
7305 Hidden Cove Rd. NE
Bainbridge Island, WA 98110-1812

RE: 2022 ANNUAL BAINBRIDGE ISLAND DECANT FACILITY SITE INSPECTION

Dear Mr. Navarette:

The Health District is writing you to inform you of the results of the annual inspection of the Bainbridge Island Decant site that was conducted on March 15, 2022. During the inspection it was noted the facility was in compliance with state and local solid waste regulations. The inspection form used to perform the inspection is included with this letter, with some notes on my observations.

Reminder only: please submit 2021 annual report by April 1st, 2022.

Please contact me if you have any questions.

Sincerely,

Barb Steusloff
Environmental Health Specialist
Solid and Hazardous Waste Program
Office Phone: 360-728-2236
Barbara.steusloff@kitsappublichealth.org

KITSAP PUBLIC
HEALTH DISTRICT

345 6th Street, Suite 300
Bremerton, WA 98337
360-728-2235

June 30, 2023

Ray Navarette
Operations & Maintenance Manager
7305 Hidden Cove Rd. NE
Bainbridge Island, WA 98110-1812

RE: 2023 ANNUAL BAINBRIDGE ISLAND DECANT FACILITY SITE INSPECTION

Dear Mr. Navarette:

The Health District is writing to inform you of the results of the annual inspection of the Bainbridge Island Decant site that was conducted on June 28, 2023. During the inspection it was noted the facility was in compliance with state and local solid waste regulations. The inspection form used to perform the inspection is included with this letter, with some notes on my observations.

- The facility is clean and well-run with no issues observed.

Please feel free to contact me if you have any questions.

Sincerely,

Kayla Petersen
Environmental Health Specialist
Solid and Hazardous Waste Program
360-728-2236
kayla.petersen@kitsappublichealth.org

APPENDIX C

Compliance Monitoring Field Forms

6-15-18

Aspect consulting
earth + water

BMW-12

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

well
start - 139.95
stop -

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
5:45				10.1	118.7	14.16	6.69	-24.5	0.02	
5:50				10.3	6.9	13.79	6.88	-25.7		
5:55				11.6	6.2	12.18	7.00	-43.9		
6:00				13.0	5.1	11.07	7.03	-13.4		
6:05				13.7	4.7	10.64	7.03	14.8		
6:10				14.1	3.3	10.45	7.04	27.0		
6:15				14.3	3.1	10.49	7.04	44.6	0.13	
6:20	Sample									

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

Aspect consulting earth + water

6-15-18

BMW-13

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Well Start 123.9 End 123.9

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf

2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
6:55				10.5	536.9	9.09	6.17	-6.9	0.02	
7:00				10.7	531.7	8.77	6.30	-24.3		
7:05				12.6	525.1	8.00	6.32	-26.0		
7:10				13.6	526.4	7.73	6.31	-24.1		
7:15				13.9	529.9	7.82	6.31	-15.8		
7:20				14.1	528.8	7.81	6.31	-18.3		
7:25				14.2	528.2	7.72	6.31	-24.3	0.02	
7:30	Sample									

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

6-15-18

Aspect consulting
earth+water

BMW-14

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Well
start 139.7
End 139.65

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
8:00				11.4	7.1	11.18	6.52	-173.3	0.02	
8:05				11.7	3.8	10.47	6.48	-238.2		
8:10				11.8	3.2	10.02	6.55	-217.1		
8:15				12.4	2.9	9.42	6.58	-212.2		
8:20				13.1	2.7	8.95	6.34	-206.1		
8:25				13.6	2.4	8.50	6.16	-199.5		
8:30				14.0	2.4	8.18	6.04	-182.1	0.02	
8:35	Sample									

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

Aspect consulting earth+water 6-15-18 BMW-15

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

well
Strt 146.35
End 146.30

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
9:02				10.9	637.3	2.88	6.41	-31.2	0.02	
9:07				10.9	634.6	2.18	6.45	-51.9		
9:12				11.7	672	1.96	6.46	-48.5		
9:17				13.3	658	1.53	6.45	-60.4		
9:22				14.2	655	1.61	6.43	-51.7		
9:27				14.6	656	1.33	6.43	-44.9	0.06	
9:32	Sample									

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

6-15-18

Aspect consulting
earth+water

BOW-37

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf

2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
10:00				13.2	1.8	7.04	6.85	-53.2	0.02	
10:05				12.9	2.3	6.70	6.83	-56.7		
10:10				12.6	2.1	6.74	6.73	-62.8		
10:15				12.4	2.0	6.70	6.62	-72.1	0.02	
10:20	Sample									

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

Surface water up stream

Time	Temp	SpC	DO	PH	ORP	Turb
9:35	8.5	68.3	10.92	6.41	104.4	24.7
9:40	8.5	68.0	10.62	6.15	111.1	
9:45	8.5	67.1	5.96	6.08	119.4	
9:50	8.5	66.4	10.83	6.05	121.9	24.7
Sample 9:50						

Surface water Down Stream

Time	Temp	SpC	DO	PH	ORP	Turb
10:00	8.0	75.8	12.13	6.89	123.0	152
10:05	8.0	74.9	11.78	6.86	132.2	
10:10	8.0	74.2	12.12	7.01	126.2	
10:15	8.0	74.0	12.72	6.94	130.0	129
Sample 10:15						

Scale: 1 square = _____

6-25-19

Aspect consulting
earth + water

BMW-12

well 141.8
141.3

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
5:50				10.1	140.1	11.18	6.48	210.2	1.35	
5:55				10.1	153.6	10.98	6.43	206.7		
6:00				10.5	156.7	10.86	6.49	197.6		
6:05				12.1	161.2	10.61	6.71	183.4		
6:10				13.7	160.2	10.43	7.09	160.2		
6:15				14.0	159.3	10.60	7.16	155.6		
6:20				14.2	164.3	10.39	7.19	153.4		
6:25	SAMPLE			14.3	163.9	8.37	7.22	153.0	0.29	

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

Aspect consulting
earth + water

BMW-13 well 126.0 125.8

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf

2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
6:50				10.5	339.6	.59	6.16	187.3	.86	
6:55				12.3	312.3	.46	6.28	177.1		
7:00				12.7	316.5	.36	6.44	168.3		
7:05				12.9	316.4	.31	6.44	167.5		
7:10				12.9	312.0	.28	6.44	167.2		
7:15				12.9	312.0	.29	6.44	167.1		
7:20				12.9	311.4	.23	6.43	167.0		
7:25	SAMPLE			12.9	313.6	.18	6.48	164.3	0.83	

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

Aspect consulting
earth + water

BMW-14 + 114

141.2

141.3

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf

2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
7:40				11.0	700	.46	6.32	178.2	.74	
7:45				11.0	701	.29	6.27	178.7		
7:50				12.0	713	.35	6.28	174.3		
7:55				13.9	725	.42	6.46	162.8		
8:00				14.6	734	.40	6.48	159.8		
8:05				14.9	737	.37	6.47	158.5		
8:10				15.0	738	.34	6.46	157.9		
8:15	SAMPLE			14.9	746	.27	6.46	161.2	.41	

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

Aspect consulting
earth+water

BMW-15 147.6
147.5

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
8:35				10.8	694	4.91	6.60	166.9	2.10	
8:40				10.5	761	1.50	6.33	173.2		
8:45				10.6	755	1.57	6.31	175.0		
8:50				10.7	795	1.23	6.34	173.8		
8:55				11.4	808	1.31	6.39	169.2		
9:00				12.2	803	1.12	6.47	164.0	0.69	
9:05	SAMPLE			12.2	808	1.08	6.48	163.7		

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

Aspect consulting
earth + water

BOW - 37

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf

2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
9:20				11.4	303.7	6.91	6.84	151.8	3.10	
9:25				11.1	294.5	6.80	6.56	166.4		
9:30				11.0	294.3	6.80	6.55	167.9		
9:35				10.8	294.4	6.82	6.59	167.5		
9:40				11.0	294.5	6.76	6.60	167.6		
9:45	SAMPLE			11.1	295.2	6.73	6.59	167.6	0.84	

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

BMW-12

12-17-19

Start 142.3

Finish 142.4

Aspect consulting
earth + water

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf

2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
6:15				9.7	163.8	10.67	8.2	222.9	0.58	
6:20				10.0	170.4	10.86	6.36	217.4		
6:25				11.6	182.4	10.56	6.62	208.9		
6:30				12.2	187.3	10.48	6.79	198.6		
6:35				12.3	189.1	10.46	6.96	188.0		
6:40				12.3	189.4	10.37	7.05	182.2	0.36	
6:45										

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

BMW-13

Start 127.6
Finish 127.4

Aspect consulting
earth + water

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
7:15				10.1	17.9	0.66	6.57	189.9	0.39	0.37
7:20				11.9	14.9	0.38	6.50	187.0		
7:25				12.3	14.9	0.29	6.52	184.5		
7:30				12.4	14.8	0.28	6.53	183.7		
7:35				12.4	14.8	0.29	6.53	183		0.40
7:40										

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

BMW-14

Start 142.5
Finish 142.5

Aspect consulting
earth+water

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
8:05				10.6	721	2.28	6.59	191.0	0.50	
8:10				11.2	772	0.58	6.43	186.0		
8:15				13.4	792	0.40	6.43	182.0		
8:20				13.6	783	0.34	6.43	180.5		
8:25				13.7	787	0.29	6.42	179	0.34	
8:30										

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

BMW-15 Start 148.7 Finish 148.6

Aspect consulting
earth+water

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
8:45				10.1	797	1.52	6.48	185.6	0.81	
8:50				10.2	791	1.58	6.46	186.5		
8:55				11.3	873	0.78	6.42	186.4		
9:00				12.8	866	0.55	6.42	184.1		
9:05				13.2	870	0.46	6.43	182.4		
9:10				13.3	877	0.44	6.43	182	0.41	
9:15										

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

BROW - 37

Aspect consulting
earth + water

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
9:40				9.7	219.3	7.29	7.39	168.3	0.27	
9:45				9.8	243.3	6.89	6.87	170.0		
9:50				9.9	287.6	6.75	6.74	171.4		
9:55				9.8	296.3	6.71	6.71	171.9	0.42	
10:00										

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

Aspect consulting
earth + water

SWU-1 12-18-19

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf

2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
8:10				5.7	95.6	9.42	7.02	202.6	9.24	
8:15				5.7	94.9	7.49	6.56	193.3		
8:20				5.7	92.1	7.00	6.52	186.0		
8:25				5.6	90.8	7.00	6.51	183.7	9.11	
8:30										

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

Aspect consulting
earth + water

12-18-19 SWD-1 / 11

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf

2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
8:40				5.8	96.2	10.25	7.40	185.0	9.99	
8:45				5.8	96.4	9.39	7.25	182.5		
8:50				5.8	96.7	8.60	7.08	182.2		
8:55				5.9	96.8	8.37	7.03	181.6	9.99	
9:10										

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

BMW-12

Aspect consulting
earth+water

6-23-10

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Start 143.4
Stop 143.4

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
5:58				10.3		16.63	5.25	223.8	.36	(756.5 mm Hg)
6:03				10.5		14.54	5.03	216.3		1[illegible] (756.4)
6:08				12.5		10.15	5.03	230.2		756.4
6:13				13.4		8.78	5.33	229.6		756.3
6:18				13.7		9.01	5.48	234.4		756.3
6:23				13.9		8.20	5.65	231.4		756.2
6:28				13.9		8.12	5.61	234.1		756.2
6:33									.50	

Sample

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

1W

BMW-13

Aspect consulting
earth+water

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Start 127.8

STOP 127.8

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf

2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
7:03				10.9		5.94	6.13	248.9	.93	756.8 mm Hg
7:08				11.5		5.32	6.05	230.3		756.8
7:13				13.2		5.22	6.07	221.6		756.8
7:18				13.6		5.26	6.03	216.5		756.8
7:23				13.6		5.34	6.03	215.2	.89	756.8
7:28										Sample

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

BMW-14
BMW-114

Aspect consulting
earth + water

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____ start 143.3

Casing Stickup (ft): _____

Total Depth (ft TOC): _____ stop 143.0

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
7:50				12.2		4.20	6.31	229.6	.53	756.3 mm Hg
7:55				12.5		5.36	6.27	226.4		756.3
8:00				13.3		6.88	6.22	217.0		756.4
8:05				13.9		6.36	6.16	214.5		756.4
8:10				14.5		6.09	6.09	214.3		756.4
8:15				14.9		6.52	6.01	219.7		756.4
8:20				15.1		5.83	5.94	217.8	.49	756.3
8:25 Sample										

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

BMW-15

Aspect consulting
earth + water

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Start 149.3

STOP 148.2

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
8:43				11.6		16.21	6.54	235.3	.51	756.1 mmHg
8:48				11.4		14.59	6.30	229.5		756.0
8:53				13.0		12.10	6.41	225.9		756.0
8:58				13.9		10.86	6.42	222.8		756.0
9:03				14.3		10.10	6.32	218.5		755.9
9:08				14.5		9.57	6.25	216.2	.40	755.8

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

BOW-37

Aspect consulting
earth + water

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____ Page: ___ of ___

Project Name: _____ Project Number: _____

Date: _____

Developed by: _____

Measuring Point of Well: _____

Screened Interval (ft. TOC) _____

Filter Pack Interval (ft. TOC) _____

Starting Water Level (ft TOC): _____

Casing Stickup (ft): _____

Total Depth (ft TOC): _____

Casing Diameter (inches): _____

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)

Casing volumes: 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf

2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Time	Cumul. Vol. (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (C or F)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	Eh ORP (mv)	Turbidity (NTU)	Comments
9:35				11.4		16.50	6.21	259.9	.31	758.3 mmHg
9:40				11.5		14.29	6.23	228.6		758.1
9:45				11.6		13.46	6.27	245.6		758.1
9:50				11.6		12.86	6.30	242.7	.33	758.1
Sample 9:55										

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appearance		Remarks
							Color	Turbidity & Sediment	

METHODS

Sampling Equipment and IDs: _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

12-16-2020

		Temp	Spc	DO	PH	ORP	Turb	well
BMW-12	well vol start 144.4	10.1	753.8	11.34	7.50	122.0	0.40	
6:20		12.1	753.7	10.56	7.44	107.6		
6:25		12.2	753.7	10.47	7.44	101.9		
6:30								
6:35		12.3	753.5	10.43	7.46	96.9		
6:40		12.3	753.4	10.33	7.48	94.2		
6:45	Sample							
							1.0	144.4
BMW-13	129.0						0.97	[redacted]
7:30		11.1	753.4	0.15	6.44	119.2		
7:35		11.9	753.4	0.36	6.49	117.0		
7:40		11.9	753.3	0.39	6.48	116.8		
7:45		11.9	753.2	0.38	6.48	116.4		
7:50	Sample						0.27	
								128.8
BMW-14/114	144.0	11.0	752.6	4.38	6.61	98.4	0.49	
8:20								
8:25		12.2	752.3	0.33	6.56	103.7		DO stuck working
8:30		12.3	752.3	—	6.55	105.1		
8:35		12.3	752.3	—	6.54	105.2		
8:40		12.3	752.4	—	6.54	105.2		
8:45	Sample						0.54	[redacted]
								1.44
BMW-15	150.2							149.1
9:15		10.3	751.9	6.25	6.53	104.4	1.44	
9:20		11.8	751.9	0.51	6.51	110.8		
9:25		11.8	751.8	0.18	6.52	111.7		
9:30		11.8	751.8	0.13	6.53	111.7		
9:35		11.8	751.7	0.12	6.53	111.7		
9:40	Sample							
							0.87	
BOW-37								
11:15		9.8	752.3	7.15	6.87	137.6	0.61	
11:20		9.9	752.3	8.05	6.88	134.7		
11:25		9.9	752.1	5.77	6.92	130.1	0.38	

Scale: 1 square = Sample 11:30

Rite in the Rain

12-16-2020

SWA-1	Time	Temp	Spc	DO	ph	ORP	Turb
	10:05	7.9	751.6	7.37	6.37	91.9	31.3
	10:10	7.4	751.6	6.83	6.25	91.6	
	10:15	7.4	751.5	6.70	6.21	93.4	
	10:20	7.4	751.4	6.74	6.21	93.9	29.7
Sample	10:25						

SWD-1/11							
	10:40	7.5	753.2	11.15	7.18	96.4	53.2
	10:45	7.5	753.1	10.44	7.23	92.1	
	10:50	7.5	752.9	10.38	7.25	91.1	
	10:55	7.5	752.8	10.35	7.25	91.2	50.1
Sample	11:00						

Scale: 1 square = _____

6-16-2021 RN/RG

BmW-12	Well Level	Temp	SPC	DO	PH	ORP	Turbidity	Notes
	144.7							
6:00		10.3 C	763.1	98.5	5.39	294.6	0.31	
6:05		12.2	763.1	101.0	5.77	302.2		
6:10		13.2	763.0	101.5	6.02	311.2		
6:15		13.4	763.0	100.8	6.17	321.8		
6:20		13.5	763.1	101.4	6.23	330.4		
6:25		13.7	763.0	100.4	6.28	337.8		
6:30		13.7	763.0	100.2	6.32	343.6		
6:35	Sample							
	144.7						0.62	

BmW-13	Well Level	Temp	SPC	DO	PH	ORP	Turb	Notes
	128.0						0.67	
7:10		10.6	763.7	8.0	5.83	381.1		
7:15		12.3	763.7	18.0	5.75	361.9		
7:20		13.1	763.7	7.2	5.78	336.5		
7:25		13.3	763.7	4.4	5.83	308.9		
7:30		13.3	763.7	4.0	5.85	286.9		
7:35		13.4	763.7	3.5	5.86	266.7		
7:40	Sample							
	129.0						0.76	

BmW-14/114	Well Level	Temp	SPC	DO	PH	ORP	Turb	Notes
	143.7							
8:05		11.4	763.4	83.1	6.00	255.0	1.09	
8:10		13.4	763.3	68.4	5.9	240.5		
8:15		13.7	763.4	61.3	5.98	229.7		
8:20		13.8	763.4	54.6	5.98	222.4		
8:25		13.9	763.4	49.0	5.97	217.4		
8:30		14.0	763.5	43.2	5.97	211.6	.48	
8:35	Sample							
	143.5							

Scale: 1 square = _____

Rite in the Rain

6-16-2021 RN/RG

BMW-15	Well Level	Temp	SPC	DO	PH	ORP	Turbidity	Notes
	150.3	10.5	763.2	32.9	6.02	207.8	0.71	
8:55								
9:00		11.1	763.2	19.6	5.87	218.2		
9:05		12.9	763.3	20.0	5.88	210.4		
9:10		13.5	763.3	20.5	5.93	203.2		
9:15		13.6	763.3	19.9	5.95	200.6		
9:20		13.7	763.3	20.2	5.95	199.7		
9:25		13.7	763.2	20.3	5.94	199.8		
9:30		13.8	763.1	20.0	5.94	199.4		
9:35	Sample 149.7						0.34	

BOW-37								
10:00		11.3	765.7	59.1	6.22	232.4	0.24	
10:05		11.1	765.7	58.7	6.06	246.7		
10:10		11.2	765.7	59.1	6.07	252.5		
10:15		11.2	765.6	59.1	6.08	255.7		
10:20		11.2	765.6	58.8	6.09	260.1		
10:25	Sample							

Scale: 1 square = _____

12-15-2021

BMW-12	Well LVL	Temp	SPC	DO	ORP	Turbidity	ph	Notes
-	145.0							
6:08		10.9	0.8	10.0	150.8	0.35	7.03	
6:13		12.8	3.4	10.67	191.2		7.35	
6:18		13.1	2.5	10.73	190.4		7.43	
6:23		13.1	3.0	10.54	198.8		7.45	
6:28		13.1	3.3	10.53	206.5		7.45	
6:33		13.1	2.0	10.54	213.4		7.45	
6:38	145.0					0.46		

BMW-13							
7:08	129.1	10.4	38.7	13.67	270.1	0.57	6.52
7:13		12.4	17.3	7.14	238.7		6.51
7:18		12.6	20.5	6.12	233.8		6.52
7:23		12.6	21.6	5.08	229.8		6.52
7:28		12.7	20.0	4.32	226.7		6.52
7:33		12.7	18.8	4.12	223.0		6.52
7:38	129.1					0.74	

BMW-14/114							
	144.5					0.44	
8:05		10.8	5.9	14.14	248.8		6.70
8:10		13.1	5.1	8.42	224.4		6.64
8:15		13.5	5.4	6.23	220.2		6.63
8:20		13.6	5.6	5.08	217.2		6.62
8:25		13.7	5.4	4.42	212.9		6.61
8:30		13.7	5.6	4.30	210.3		6.61
8:35	144.5					0.51	

Scale: 1 square = _____

Rite in the Rain

BMW-15	Well Lvl	Temp	SPC	DO	ORP	Turbidity	PH	Notes
	150.8					0.73		
8:55		10.1	7.6	11.11	245.4		6.86	
9:00		10.5	7.5	8.67	249.8		6.72	
9:05		12.5	7.9	6.94	228.4		6.67	
9:10		13.2	7.4	6.28	220.2		6.66	
9:15		13.3	7.9	6.12	215.7		6.65	
9:20		13.3	7.2	6.05	213.0		6.64	
9:25								
	150.7					0.80		

BOW-37						1.10		
10:50		8.5	292.2	8.76	276.1	1.10	6.94	
10:55		9.4	292.5	7.62	274.4		6.91	
11:00		9.0	291.6	7.18	274.5		6.92	
11:05		9.2	291.4	7.03	274.3	0.86	6.92	
11:10								

Scale: 1 square = _____

12-15-21

SWC-1	Temp	SPC	DO	ORP	Turbidity	Ph	Notes
9:50	5.7	42.3	13.46	190.0	23.9	7.36	
9:55	5.5	41.6	12.65	194.9		6.31	
10:00	5.5	41.6	12.78	198.9		6.26	
10:05	5.6	41.5	12.62	200.8	20.3	6.25	
10:10							

SWD-1/11							
10:20	5.5	46.5	13.10	222.31	2.0	7.04	
10:25	5.5	46.4	12.91	228.31		7.15	
10:30	5.5	46.7	12.92	230.41		7.16	
10:35					1.94		

Scale: 1 square = _____

Rite in the Rain

12-13-22	DTW Level	Temp	pH	DO	ORP	Turb	SPC	
BMW-15								
	150.5					0.41		
900		12.1	6.57	29.0	94.2		675	675
905		12.7	6.59	25.7	89.8		667	667
910		12.7	6.57	24.6	89.8		670	670
915		12.8	6.56	23.9	88.7		662	
920		12.9	6.55	23.4	87.6		661	
925	SAMPLE 150.5					0.41		
BOW-37								
	WELL AT SITE IS UNDER CONSTRUCTION COULD NOT SAMPLE.							
SW1-1								
950		4.9	6.42	123.1	69.6		60.2	
955		4.9	6.01	107.6	77.8		60.2	
1000		4.9	6.00	105.2	76.9		60.3	
1005	SAMPLE					19.9		
SW2-1/11								
10:25		4.5	6.62	158.9	80.6		58.5	
10:30		4.5	6.79	120.6	77.2		58.6	
10:35		4.5	6.96	115.2	76.1		58.6	
10:40	SAMPLE					17.3		

Scale: 1 square = _____

Rite in the Rain

		Temp	ph	DO	ORP	Turb	SPC
BMW-12	Well level						
	144.55	10.8°					
5:55		10.8C	6.93	131.0	144.7	0.71	203.9
6:00		10.9C	7.10	131.8	135.8		203.1
6:05		12.2C	7.12	130.7	131.5		203.6
6:10		12.5C	7.15	131.3	127.0		200
6:15		12.5C	7.13	131.0	125.3		
6:20	SAMPLE 144.52					0.39	
BMW-13							
	128.4					0.33	
7:00		11.6	6.42	14.3	121.8		
7:05		12.6	6.43	9.4	117.1		
7:10		12.9	6.42	7.8	113.8		
7:15		12.9	6.41	6.1	109.9		988
7:20		13.0	6.41	5.4	107.1		980
7:25		13.0	6.41	5.1	106.0		984
~~7:30~~	SAMPLE 128.4					0.30	
BMW-14 114	143.95					0.21	
8:00		11.1°	6.54	18.2	105.9		580.4
8:05		13.0°	6.59	8.6	98.6		615.6
8:10		13.4°	6.57	6.2	97.6		625.7
8:15		13.5°	6.55	5.3	96.7		646.3
8:20		13.6	6.53	5.0	95.4		651
8:25	SAMPLE	13.6	6.53	4.1	94.4		
~~8:30~~	143.95					0.29	

Scale: 1 square = _____

6-8-2022

	Well Lvl	Temp	pH	SpC (mm Hg)	DO	ORP	Turbidity	Notes
BMW-15								
	150.0							1.62
8:35	150.0	10.6	6.32	754.9	31.4	92.2	1.62	
8:40		12.0	6.20	754.9	26.9	94.6		
8:45		12.5	6.21	755.0	22.0	92,5		
8:50		12.6	6.23	754.9	21.9	90.2		
8:55		12.7	6.25	755.0	18.2	88.3		
9:00		12.7	6.26	755.0	17.8	87.0		
9:05	150.0	12.7	6.26	755.0	17.4	86.0	0.36	
9:10								
BOW-37								
9:35		11.3	6.58	757.9	78.3	79.4	1.05	
9:40		11.2	6.35	757.7	76.6	88,8		
9:45		11.2	6.34	757.7	75.8	95,3		
9:50		10.8	6.33	757.7	71.6	97.6	1.42	
9:55								

Scale: 1 square = _____

Rite in the Rain

6-8-2022

				mm Hg				
BMW-12	well LVL	Temp	Ph	~~SPC~~	DO	ORP	Turbidity	Notes
	144.4						1 NTU	
5:45	144.4	10.7	6.20	754.1	114.6	142.0	1 NTU	
5:50		11.7	6.26	754.1	115.5	127.7		
5:55		11.8	6.36	754.2	115.4	118.0		
6:00		11.9	6.43	754.1	114.7	111.3		
6:05		11.9	6.48	754.2	113.5	105.8		
6:10	144.4	11.9	6.49	754.3	113.3	103.3	0.58	
6:15								
BMW-13	127.3							
6:40		10.6	5.86	755.0	45.5	105.3	1.05	
6:45		11.5	5.88	755.0	7.0	102.1		
6:50		11.5	5.90	755.0	5.7	98.5		
6:55		11.6	5.92	755.1	5.1	95.8		
7:00		11.6	5.94	755.1	5.0	93.4		
7:05	127.2	11.6	5.95	755.1	4.8	91.7	1.05	
7:10								
BMW-14/114	143.3						0.75	
7:30		11.1	6.28	754.9	16.3	91.8		
7:35		11.5	6.23	754.8	13.3	94.3		
7:40		13.0	6.19	754.9	32.3	93.9		
7:45		13.2	6.23	754.9	14.3	89.1		
7:50		13.2	6.26	754.9	9.3	86.9		
7:55		13.3	6.26	755.0	6.6	85.0		
8:00		13.3	6.26	755.0	5.2	84.3		
8:05		13.3	6.25	755.0	4.4	83.4		
8:10	143.3	13.3	6.25	755.0	4.2	82.2	0.25	
8:15								

Scale: 1 square = _____

APPENDIX D

Laboratory Reports

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Road Landfill
Work Order Number: 1812320

December 31, 2018

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 7 sample(s) on 12/20/2018 for the analyses presented in the following report.

Dissolved Metals by EPA Method 6020
Ion Chromatography by EPA Method 300.0
Total Metals by EPA Method 6020
Volatile Organic Compounds by EPA Method 8260 SIM

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

Date: *12/31/2018*

CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill
Work Order: 1812320

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1812320-001	BMW-12	12/20/2018 6:15 AM	12/20/2018 12:50 PM
1812320-002	BMW-13	12/20/2018 7:15 AM	12/20/2018 12:50 PM
1812320-003	BMW-14	12/20/2018 9:10 AM	12/20/2018 12:50 PM
1812320-004	BMW-114	12/20/2018 9:10 AM	12/20/2018 12:50 PM
1812320-005	BMW-15	12/20/2018 8:20 AM	12/20/2018 12:50 PM
1812320-006	BOW-37	12/20/2018 11:00 AM	12/20/2018 12:50 PM
1812320-007	Trip Blank	12/18/2018 8:55 AM	12/20/2018 12:50 PM

Case Narrative

WO#: **1812320**
Date: **12/31/2018**

CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **1812320**
Date Reported: **12/31/2018**

Client: City of Bainbridge Island
Project: Vincent Road Landfill
Lab ID: 1812320-001
Client Sample ID: **BMW-12**

Collection Date: 12/20/2018 6:15:00 AM
Matrix: Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260 SIM				Batch ID: 23097		Analyst: EM
Vinyl chloride	ND	0.0100		µg/L	1	12/28/2018 6:17:25 AM
1,1-Dichloroethene	ND	0.0100		µg/L	1	12/28/2018 6:17:25 AM
Surr: Dibromofluoromethane	102	68 - 140		%Rec	1	12/28/2018 6:17:25 AM
Surr: Toluene-d8	99.0	63.5 - 144		%Rec	1	12/28/2018 6:17:25 AM
Surr: 4-Bromofluorobenzene	100	55 - 134		%Rec	1	12/28/2018 6:17:25 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 23037		Analyst: TN
Nitrate+Nitrite	0.785	0.100		mg/L	1	12/21/2018 1:47:00 PM
Dissolved Metals by EPA Method 6020				Batch ID: 23104		Analyst: WC
Manganese	ND	2.00		µg/L	1	12/28/2018 8:18:49 PM
Total Metals by EPA Method 6020				Batch ID: 23086		Analyst: WC
Manganese	ND	2.00		µg/L	1	12/28/2018 11:28:12 PM

Analytical Report

Work Order: **1812320**
Date Reported: **12/31/2018**

Client: City of Bainbridge Island
Collection Date: 12/20/2018 7:15:00 AM
Project: Vincent Road Landfill
Lab ID: 1812320-002
Matrix: Groundwater
Client Sample ID: **BMW-13**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260 SIM				Batch ID: 23097		Analyst: EM
Vinyl chloride	ND	0.0100		µg/L	1	12/28/2018 7:29:06 AM
1,1-Dichloroethene	ND	0.0100		µg/L	1	12/28/2018 7:29:06 AM
Surr: Dibromofluoromethane	102	68 - 140		%Rec	1	12/28/2018 7:29:06 AM
Surr: Toluene-d8	98.7	63.5 - 144		%Rec	1	12/28/2018 7:29:06 AM
Surr: 4-Bromofluorobenzene	100	55 - 134		%Rec	1	12/28/2018 7:29:06 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 23037		Analyst: TN
Nitrate+Nitrite	2.26	0.100		mg/L	1	12/21/2018 2:10:00 PM
Dissolved Metals by EPA Method 6020				Batch ID: 23104		Analyst: WC
Manganese	1,380	2.00		µg/L	1	12/28/2018 8:38:56 PM
Total Metals by EPA Method 6020				Batch ID: 23086		Analyst: WC
Manganese	1,550	2.00		µg/L	1	12/28/2018 11:32:14 PM

Analytical Report

Work Order: **1812320**
Date Reported: **12/31/2018**

Client: City of Bainbridge Island
Collection Date: 12/20/2018 9:10:00 AM
Project: Vincent Road Landfill
Lab ID: 1812320-003
Matrix: Groundwater
Client Sample ID: **BMW-14**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260 SIM				Batch ID: 23097		Analyst: EM
Vinyl chloride	0.226	0.0100		µg/L	1	12/28/2018 8:04:58 AM
1,1-Dichloroethene	0.0280	0.0100		µg/L	1	12/28/2018 8:04:58 AM
Surr: Dibromofluoromethane	98.4	68 - 140		%Rec	1	12/28/2018 8:04:58 AM
Surr: Toluene-d8	101	63.5 - 144		%Rec	1	12/28/2018 8:04:58 AM
Surr: 4-Bromofluorobenzene	99.9	55 - 134		%Rec	1	12/28/2018 8:04:58 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 23037		Analyst: TN
Nitrate+Nitrite	0.200	0.200	D	mg/L	2	12/21/2018 2:33:00 PM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 6020				Batch ID: 23104		Analyst: WC
Manganese	51.0	2.00		µg/L	1	12/28/2018 8:51:03 PM
Total Metals by EPA Method 6020				Batch ID: 23086		Analyst: WC
Manganese	50.1	2.00		µg/L	1	12/28/2018 11:36:15 PM

Analytical Report

Work Order: **1812320**
Date Reported: **12/31/2018**

Client: City of Bainbridge Island
Collection Date: 12/20/2018 9:10:00 AM
Project: Vincent Road Landfill
Lab ID: 1812320-004
Matrix: Groundwater
Client Sample ID: **BMW-114**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260 SIM				Batch ID: 23097		Analyst: EM
Vinyl chloride	0.217	0.0100		µg/L	1	12/28/2018 8:40:51 AM
1,1-Dichloroethene	0.0267	0.0100		µg/L	1	12/28/2018 8:40:51 AM
Surr: Dibromofluoromethane	98.2	68 - 140		%Rec	1	12/28/2018 8:40:51 AM
Surr: Toluene-d8	101	63.5 - 144		%Rec	1	12/28/2018 8:40:51 AM
Surr: 4-Bromofluorobenzene	99.5	55 - 134		%Rec	1	12/28/2018 8:40:51 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 23037		Analyst: TN
Nitrate+Nitrite	0.192	0.200	JD	mg/L	2	12/21/2018 2:56:00 PM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 6020				Batch ID: 23104		Analyst: WC
Manganese	52.4	2.00		µg/L	1	12/28/2018 8:55:04 PM
Total Metals by EPA Method 6020				Batch ID: 23086		Analyst: WC
Manganese	53.7	2.00		µg/L	1	12/28/2018 11:40:17 PM

Analytical Report

Work Order: **1812320**
Date Reported: **12/31/2018**

Client: City of Bainbridge Island
Collection Date: 12/20/2018 8:20:00 AM
Project: Vincent Road Landfill
Lab ID: 1812320-005
Matrix: Groundwater
Client Sample ID: **BMW-15**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260 SIM				Batch ID: 23097		Analyst: EM
Vinyl chloride	ND	0.0100		µg/L	1	12/28/2018 9:16:49 AM
1,1-Dichloroethene	ND	0.0100		µg/L	1	12/28/2018 9:16:49 AM
Surr: Dibromofluoromethane	101	68 - 140		%Rec	1	12/28/2018 9:16:49 AM
Surr: Toluene-d8	98.6	63.5 - 144		%Rec	1	12/28/2018 9:16:49 AM
Surr: 4-Bromofluorobenzene	100	55 - 134		%Rec	1	12/28/2018 9:16:49 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 23037		Analyst: TN
Nitrate+Nitrite	0.584	0.200	D	mg/L	2	12/21/2018 3:19:00 PM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 6020				Batch ID: 23104		Analyst: WC
Manganese	ND	2.00		µg/L	1	12/28/2018 8:59:06 PM
Total Metals by EPA Method 6020				Batch ID: 23086		Analyst: WC
Manganese	ND	2.00		µg/L	1	12/28/2018 11:44:18 PM

Analytical Report

Work Order: **1812320**
Date Reported: **12/31/2018**

Client: City of Bainbridge Island
Collection Date: 12/20/2018 11:00:00 AM
Project: Vincent Road Landfill
Lab ID: 1812320-006
Matrix: Groundwater
Client Sample ID: **BOW-37**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260 SIM				Batch ID: 23097		Analyst: EM
Vinyl chloride	ND	0.0100		µg/L	1	12/28/2018 9:52:52 AM
1,1-Dichloroethene	ND	0.0100		µg/L	1	12/28/2018 9:52:52 AM
Surr: Dibromofluoromethane	100	68 - 140		%Rec	1	12/28/2018 9:52:52 AM
Surr: Toluene-d8	98.8	63.5 - 144		%Rec	1	12/28/2018 9:52:52 AM
Surr: 4-Bromofluorobenzene	100	55 - 134		%Rec	1	12/28/2018 9:52:52 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 23037		Analyst: TN
Nitrate+Nitrite	1.79	0.100		mg/L	1	12/21/2018 3:42:00 PM
Dissolved Metals by EPA Method 6020				Batch ID: 23104		Analyst: WC
Manganese	ND	2.00		µg/L	1	12/28/2018 9:03:07 PM
Total Metals by EPA Method 6020				Batch ID: 23086		Analyst: WC
Manganese	ND	2.00		µg/L	1	12/28/2018 11:48:20 PM

Work Order: 1812320
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID	**MB-23037**	SampType:	**MBLK**			Units:	**mg/L**	Prep Date:	**12/21/2018**	RunNo:	**48495**
Client ID:	**MBLKW**	Batch ID:	**23037**					Analysis Date:	**12/21/2018**	SeqNo:	**950113**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate+Nitrite	ND	0.100									

Sample ID	**LCS-23037**	SampType:	**LCS**			Units:	**mg/L**	Prep Date:	**12/21/2018**	RunNo:	**48495**
Client ID:	**LCSW**	Batch ID:	**23037**					Analysis Date:	**12/21/2018**	SeqNo:	**950114**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate+Nitrite	1.43	0.100	1.500	0	95.3	90	110				

Sample ID	**1812319-001BDUP**	SampType:	**DUP**			Units:	**mg/L**	Prep Date:	**12/21/2018**	RunNo:	**48495**
Client ID:	**BATCH**	Batch ID:	**23037**					Analysis Date:	**12/21/2018**	SeqNo:	**950099**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate+Nitrite	0.836	0.100						0.8370	0.120	20	

Sample ID	**1812319-001BMS**	SampType:	**MS**			Units:	**mg/L**	Prep Date:	**12/21/2018**	RunNo:	**48495**
Client ID:	**BATCH**	Batch ID:	**23037**					Analysis Date:	**12/21/2018**	SeqNo:	**950100**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate+Nitrite	2.37	0.100	1.500	0.8370	102	80	120				

Sample ID	**1812319-001BMSD**	SampType:	**MSD**			Units:	**mg/L**	Prep Date:	**12/21/2018**	RunNo:	**48495**
Client ID:	**BATCH**	Batch ID:	**23037**					Analysis Date:	**12/21/2018**	SeqNo:	**950101**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate+Nitrite	2.36	0.100	1.500	0.8370	101	80	120	2.369	0.508	20	

Work Order: 1812320
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID	**1812320-006DDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/21/2018**		RunNo: **48495**		
Client ID:	**BOW-37**	Batch ID: **23037**					Analysis Date: **12/21/2018**		SeqNo: **950110**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate+Nitrite	1.80	0.100						1.794	0.278	20	

Sample ID	**1812320-006DMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **12/21/2018**		RunNo: **48495**		
Client ID:	**BOW-37**	Batch ID: **23037**					Analysis Date: **12/21/2018**		SeqNo: **950111**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate+Nitrite	2.75	0.100	1.500	1.794	63.6	80	120				S

NOTES:
S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).

Work Order: 1812320
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Dissolved Metals by EPA Method 6020

Sample ID	**MB-23104**	SampType:	**MBLK**			Units:	**µg/L**	Prep Date:	**12/28/2018**	RunNo:	**48645**
Client ID:	**MBLKW**	Batch ID:	**23104**					Analysis Date:	**12/28/2018**	SeqNo:	**953793**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	2.00									

Sample ID	**LCS-23104**	SampType:	**LCS**			Units:	**µg/L**	Prep Date:	**12/28/2018**	RunNo:	**48645**
Client ID:	**LCSW**	Batch ID:	**23104**					Analysis Date:	**12/28/2018**	SeqNo:	**953794**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	113	2.00	100.0	0	113	80	120				

Sample ID	**1812320-001CDUP**	SampType:	**DUP**			Units:	**µg/L**	Prep Date:	**12/28/2018**	RunNo:	**48645**
Client ID:	**BMW-12**	Batch ID:	**23104**					Analysis Date:	**12/28/2018**	SeqNo:	**953796**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	2.00						0		20	

Sample ID	**1812320-001CMS**	SampType:	**MS**			Units:	**µg/L**	Prep Date:	**12/28/2018**	RunNo:	**48645**
Client ID:	**BMW-12**	Batch ID:	**23104**					Analysis Date:	**12/28/2018**	SeqNo:	**953798**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	515	2.00	500.0	0	103	75	125				

Sample ID	**1812320-001CMSD**	SampType:	**MSD**			Units:	**µg/L**	Prep Date:	**12/28/2018**	RunNo:	**48645**
Client ID:	**BMW-12**	Batch ID:	**23104**					Analysis Date:	**12/28/2018**	SeqNo:	**953799**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	529	2.00	500.0	0	106	75	125	515.3	2.62	20	

Work Order: 1812320
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Dissolved Metals by EPA Method 6020

Sample ID **MB-23082FB**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/28/2018**			RunNo: **48645**		
Client ID: **MBLKW**	Batch ID: **23104**					Analysis Date: **12/28/2018**			SeqNo: **953807**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	2.00									

NOTES:
Filter Blank

Work Order: 1812320
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Total Metals by EPA Method 6020

Sample ID	**MB-23086**	SampType:	**MBLK**			Units:	**µg/L**	Prep Date:	**12/27/2018**	RunNo:	**48647**
Client ID:	**MBLKW**	Batch ID:	**23086**					Analysis Date:	**12/28/2018**	SeqNo:	**953886**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	2.00									

Sample ID	**LCS-23086**	SampType:	**LCS**			Units:	**µg/L**	Prep Date:	**12/27/2018**	RunNo:	**48647**
Client ID:	**LCSW**	Batch ID:	**23086**					Analysis Date:	**12/28/2018**	SeqNo:	**953887**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	85.7	2.00	80.00	0	107	80	120				

Sample ID	**1812315-001ADUP**	SampType:	**DUP**			Units:	**µg/L**	Prep Date:	**12/27/2018**	RunNo:	**48647**
Client ID:	**BATCH**	Batch ID:	**23086**					Analysis Date:	**12/28/2018**	SeqNo:	**953889**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	38.0	2.00						36.89	2.88	20	

Sample ID	**1812315-001AMS**	SampType:	**MS**			Units:	**µg/L**	Prep Date:	**12/27/2018**	RunNo:	**48647**
Client ID:	**BATCH**	Batch ID:	**23086**					Analysis Date:	**12/28/2018**	SeqNo:	**953891**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	486	2.00	400.0	36.89	112	75	125				

Sample ID	**1812315-001AMSD**	SampType:	**MSD**			Units:	**µg/L**	Prep Date:	**12/27/2018**	RunNo:	**48647**
Client ID:	**BATCH**	Batch ID:	**23086**					Analysis Date:	**12/28/2018**	SeqNo:	**953894**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	466	2.00	400.0	36.89	107	75	125	486.5	4.37	20	

Work Order: 1812320
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260 SIM

Sample ID **LCS-23097**	SampType: **LCS**			Units: **µg/L**		Prep Date: **12/27/2018**		RunNo: **48629**		
Client ID: **LCSW**	Batch ID: **23097**					Analysis Date: **12/28/2018**		SeqNo: **953352**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	4.67	0.0100	5.000	0	93.5	56.3	134				
1,1-Dichloroethene	4.98	0.0100	5.000	0	99.7	51.5	142				
Surr: Dibromofluoromethane	9.91		10.00		99.1	68	140				
Surr: Toluene-d8	10.1		10.00		101	63.5	144				
Surr: 4-Bromofluorobenzene	10.1		10.00		101	55	134				

Sample ID **MB-23097**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/27/2018**		RunNo: **48629**		
Client ID: **MBLKW**	Batch ID: **23097**					Analysis Date: **12/28/2018**		SeqNo: **953355**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100									
1,1-Dichloroethene	ND	0.0100									
Surr: Dibromofluoromethane	10.1		10.00		101	68	140				
Surr: Toluene-d8	9.82		10.00		98.2	63.5	144				
Surr: 4-Bromofluorobenzene	10.0		10.00		100	55	134				

Sample ID **1812320-001ADUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **12/27/2018**		RunNo: **48629**		
Client ID: **BMW-12**	Batch ID: **23097**					Analysis Date: **12/28/2018**		SeqNo: **953342**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100						0		30	
1,1-Dichloroethene	ND	0.0100						0		30	
Surr: Dibromofluoromethane	10.1		10.00		101	68	140		0		
Surr: Toluene-d8	9.79		10.00		97.9	63.5	144		0		
Surr: 4-Bromofluorobenzene	9.97		10.00		99.7	55	134		0		

Work Order: 1812320
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260 SIM

Sample ID **1812320-002AMS** SampType: **MS** Units: **µg/L** Prep Date: **12/27/2018** RunNo: **48629**
Client ID: **BMW-13** Batch ID: **23097** Analysis Date: **12/28/2018** SeqNo: **953344**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	4.98	0.0100	5.000	0	99.5	40.8	154				
1,1-Dichloroethene	5.13	0.0100	5.000	0	103	37.5	171				
Surr: Dibromofluoromethane	9.83		10.00		98.3	77.9	124				
Surr: Toluene-d8	10.2		10.00		102	63.5	144				
Surr: 4-Bromofluorobenzene	10.1		10.00		101	77.4	118				

Sample ID **1812320-002AMSD** SampType: **MSD** Units: **µg/L** Prep Date: **12/27/2018** RunNo: **48629**
Client ID: **BMW-13** Batch ID: **23097** Analysis Date: **12/28/2018** SeqNo: **953345**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	5.36	0.0100	5.000	0	107	40.8	154	4.977	7.45	30	
1,1-Dichloroethene	5.44	0.0100	5.000	0	109	37.5	171	5.134	5.75	30	
Surr: Dibromofluoromethane	9.93		10.00		99.3	77.9	124		0		
Surr: Toluene-d8	10.1		10.00		101	63.5	144		0		
Surr: 4-Bromofluorobenzene	10.0		10.00		100	77.4	118		0		

Sample Log-In Check List

Client Name:	**COBI**	Work Order Number:	**1812320**
Logged by:	**Brianna Barnes**	Date Received:	**12/20/2018 12:50:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Courier		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C*	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☑	No ☐	NA ☐
			HNO3 added to B fraction.	
12.	Is there headspace in the VOA vials?	Yes ☐	No ☑	NA ☐
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☑	No ☐	NA ☐

Person Notified:	Aaron Claiborne	Date	12/20/2018
By Whom:	Brianna Barnes	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Confirmation of analysis.		
Client Instructions:	See COC revision.		

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler	8.0
Sample	8.6
Temp Blank	7.6

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: | Page: 1 of: 1 | Laboratory Project No (internal): 1912320

Project Name: Vincent Road Landfill | Special Remarks:

Client: City of Bainbridge Island | Project No:

Address: 7305 Hidden Cove Rd NE | Collected by: RAY NAVARETTE

City, State, Zip: Bainbridge Is. WA 98110 | Location: Vincent Road Landfill

Telephone: 206-780-3585 | Report To (PM): Aaron Claiborne | Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Fax: 206-780-5104 | PM Email: aclaiborne@bainbridgewa.gov

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8) Total (T) | Dissolved (D)	Anions (IC)***	EDB (8011)	DOC	Comments
1 BMW-12	12/20/18	6:15	GW	3									1 1				
2 BMW-13		7:15	GW	3									1 1		2		
3 BMW-14		9:10	GW	3									1 1				
4 BMW-114		9:10	GW	3									1 1				
5 BMW-15		8:20	GW	3									1 1				
6 BOW-37		11:00	GW	3									1 1				
7																	
8																	
9																	
10																	

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x	12-20-18 1209	x	12/20/18 1209
x	12/20/18 1226	x	12/20/18 1250

Turn-around Time:
☐ Standard
☐ 3 Day
☐ 2 Day
☐ Next Day
Same Day _____ (specify)

Chain of Custody Record & Laboratory Services Agreement

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: Page: 1 of: 1

Laboratory Project No (internal): 1812320

Project Name: Vincent Road Landfill

Special Remarks: VOCs: 1,1-DCE, VC only.

Project No:

Client: City of Bainbridge Island

Collected by: RAY NAVARETTE

Address: 7305 Hidden Cove Rd NE

Location: Vincent Road Landfill

City, State, Zip: Bainbridge Is. WA 98110

edits per AC 12/21/18 BMB

Report To (PM): Aaron Claiborne

Telephone: 206-780-3585

Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Fax: 206-780-5104

PM Email: aclaiborne@bainbridgewa.gov

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624) - SIM	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals**	EPA 6020 / 200.8) Total (T)	Dissolved (D)	Anions (IC)***	EDB (8011)	QC				Comments
1 BMW-12	12/20/18	6:15	GW	3									X	1	1							
2 BMW-13		7:15	GW	3									X	1	1		2					
3 BMW-14		9:10	GW	3									X	1	1							
4 BMW-114		9:10	GW	3									X	1	1							
5 BMW-15		8:20	GW	3									X	1	1							
6 BOW-37		11:00	GW	3									X	1	1							
7																						
8																						
9																						
10																						

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x	12-20-18 1209	x	12/20/18 1209
Relinquished	Date/Time	Received	Date/Time
x	12/20/18 1226	x	12/20/18 1250

Turn-around Time:

- ☐ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

June 25, 2018

Aaron Claiborne
City of Bainbridge Island
7305 Hidden Cove Road
Bainbridge Island, WA 98110

RE: Project: Vincent Road Landfill GW
Pace Project No.: 10435734

Dear Aaron Claiborne:
Enclosed are the analytical results for sample(s) received by the laboratory on June 16, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jared Dickinson
jared.dickinson@pacelabs.com
(612)607-1700
Project Manager

Enclosures

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CERTIFICATIONS

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10435734001	**Trip Blank**	Water	06/15/18 00:00	06/16/18 09:10
10435734002	**BMW-12**	Water	06/15/18 06:20	06/16/18 09:10
10435734003	**BMW-13**	Water	06/15/18 07:30	06/16/18 09:10
10435734004	**BMW-14**	Water	06/15/18 08:35	06/16/18 09:10
10435734005	**BMW-114**	Water	06/15/18 08:35	06/16/18 09:10
10435734006	**BMW-15**	Water	06/15/18 09:32	06/16/18 09:10
10435734007	**BOW-37**	Water	06/15/18 10:20	06/16/18 09:10

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SAMPLE ANALYTE COUNT

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10435734002	**BMW-12**	EPA 6010D	IP	1
		EPA 6010D	DM	1
		SM 2320B	DCL	4
		EPA 353.2	JFP	1
10435734003	**BMW-13**	EPA 6010D	IP	1
		EPA 6010D	DM	1
		SM 2320B	DCL	4
		EPA 353.2	JFP	1
10435734004	**BMW-14**	EPA 6010D	IP	1
		EPA 6010D	DM	1
		SM 2320B	DCL	4
		EPA 353.2	JFP	1
10435734005	**BMW-114**	EPA 6010D	IP	1
		EPA 6010D	DM	1
		SM 2320B	DCL	4
		EPA 353.2	JFP	1
10435734006	**BMW-15**	EPA 6010D	IP	1
		EPA 6010D	DM	1
		SM 2320B	DCL	4
		EPA 353.2	JFP	1
10435734007	**BOW-37**	EPA 6010D	IP	1
		EPA 6010D	DM	1
		SM 2320B	DCL	4
		EPA 353.2	JFP	1

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PROJECT NARRATIVE

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

Method: **EPA 6010D**
Description: 6010D MET ICP
Client: City of Bainbridge Island
Date: June 25, 2018

General Information:
6 samples were analyzed for EPA 6010D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

Method: **EPA 6010D**
Description: 6010D MET ICP, Lab Filtered
Client: City of Bainbridge Island
Date: June 25, 2018

General Information:
6 samples were analyzed for EPA 6010D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: City of Bainbridge Island
Date: June 25, 2018

General Information:
6 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

Method: **EPA 353.2**
Description: 353.2 Nitrate + Nitrite
Client: City of Bainbridge Island
Date: June 25, 2018

General Information:
6 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

Sample: BMW-12 **Lab ID: 10435734002** Collected: 06/15/18 06:20 Received: 06/16/18 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D		Preparation Method: EPA 3010					
Manganese	ND	ug/L	5.0	1	06/20/18 09:31	06/20/18 11:37	7439-96-5	
6010D MET ICP, Lab Filtered	Analytical Method: EPA 6010D		Preparation Method: EPA 3010					
Manganese, Dissolved	ND	ug/L	5.0	1	06/21/18 10:08	06/21/18 14:43	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Hydroxide (CaCO3)	ND	mg/L	5.0	1		06/20/18 08:56		
Alkalinity, Total as CaCO3	**53.3**	mg/L	5.0	1		06/20/18 08:56		
Alkalinity,Bicarbonate (CaCO3)	**53.3**	mg/L	5.0	1		06/20/18 08:56		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		06/20/18 08:56		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.83**	mg/L	0.10	1		06/20/18 11:01		

Sample: BMW-13 **Lab ID: 10435734003** Collected: 06/15/18 07:30 Received: 06/16/18 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D		Preparation Method: EPA 3010					
Manganese	**3040**	ug/L	5.0	1	06/20/18 09:31	06/20/18 11:40	7439-96-5	
6010D MET ICP, Lab Filtered	Analytical Method: EPA 6010D		Preparation Method: EPA 3010					
Manganese, Dissolved	**3020**	ug/L	5.0	1	06/21/18 10:08	06/21/18 14:51	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Hydroxide (CaCO3)	ND	mg/L	5.0	1		06/20/18 09:01		
Alkalinity, Total as CaCO3	**351**	mg/L	5.0	1		06/20/18 09:01		
Alkalinity,Bicarbonate (CaCO3)	**351**	mg/L	5.0	1		06/20/18 09:01		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		06/20/18 09:01		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.14**	mg/L	0.10	1		06/20/18 11:04		

Sample: BMW-14 **Lab ID: 10435734004** Collected: 06/15/18 08:35 Received: 06/16/18 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D		Preparation Method: EPA 3010					
Manganese	**20.4**	ug/L	5.0	1	06/20/18 09:31	06/20/18 11:43	7439-96-5	
6010D MET ICP, Lab Filtered	Analytical Method: EPA 6010D		Preparation Method: EPA 3010					
Manganese, Dissolved	**19.7**	ug/L	5.0	1	06/21/18 10:08	06/21/18 14:53	7439-96-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

Sample: BMW-14 **Lab ID: 10435734004** Collected: 06/15/18 08:35 Received: 06/16/18 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Hydroxide (CaCO3)	ND	mg/L	5.0	1		06/20/18 09:04		
Alkalinity, Total as CaCO3	**355**	mg/L	5.0	1		06/20/18 09:04		
Alkalinity,Bicarbonate (CaCO3)	**355**	mg/L	5.0	1		06/20/18 09:04		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		06/20/18 09:04		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		06/20/18 11:10		

Sample: BMW-114 **Lab ID: 10435734005** Collected: 06/15/18 08:35 Received: 06/16/18 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D	Preparation Method: EPA 3010						
Manganese	**21.3**	ug/L	5.0	1	06/20/18 09:31	06/20/18 11:46	7439-96-5	
6010D MET ICP, Lab Filtered	Analytical Method: EPA 6010D	Preparation Method: EPA 3010						
Manganese, Dissolved	**22.3**	ug/L	5.0	1	06/21/18 10:08	06/21/18 14:54	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Hydroxide (CaCO3)	ND	mg/L	5.0	1		06/20/18 09:08		
Alkalinity, Total as CaCO3	**342**	mg/L	5.0	1		06/20/18 09:08		
Alkalinity,Bicarbonate (CaCO3)	**342**	mg/L	5.0	1		06/20/18 09:08		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		06/20/18 09:08		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		06/20/18 11:11		

Sample: BMW-15 **Lab ID: 10435734006** Collected: 06/15/18 09:32 Received: 06/16/18 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D	Preparation Method: EPA 3010						
Manganese	ND	ug/L	5.0	1	06/20/18 09:31	06/20/18 11:49	7439-96-5	
6010D MET ICP, Lab Filtered	Analytical Method: EPA 6010D	Preparation Method: EPA 3010						
Manganese, Dissolved	ND	ug/L	5.0	1	06/21/18 10:08	06/21/18 15:01	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Hydroxide (CaCO3)	ND	mg/L	5.0	1		06/20/18 09:12		
Alkalinity, Total as CaCO3	**319**	mg/L	5.0	1		06/20/18 09:12		
Alkalinity,Bicarbonate (CaCO3)	**319**	mg/L	5.0	1		06/20/18 09:12		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		06/20/18 09:12		

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ANALYTICAL RESULTS

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

Sample: BMW-15 **Lab ID: 10435734006** Collected: 06/15/18 09:32 Received: 06/16/18 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.70**	mg/L	0.10	1		06/20/18 11:12		

Sample: BOW-37 **Lab ID: 10435734007** Collected: 06/15/18 10:20 Received: 06/16/18 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D	Preparation Method: EPA 3010						
Manganese	ND	ug/L	5.0	1	06/20/18 09:31	06/20/18 11:52	7439-96-5	
6010D MET ICP, Lab Filtered	Analytical Method: EPA 6010D	Preparation Method: EPA 3010						
Manganese, Dissolved	ND	ug/L	5.0	1	06/21/18 10:08	06/21/18 15:03	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Hydroxide (CaCO3)	ND	mg/L	5.0	1		06/20/18 09:15		
Alkalinity, Total as CaCO3	**124**	mg/L	5.0	1		06/20/18 09:15		
Alkalinity,Bicarbonate (CaCO3)	**124**	mg/L	5.0	1		06/20/18 09:15		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		06/20/18 09:15		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**2.3**	mg/L	0.50	5		06/20/18 11:37		

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QUALITY CONTROL DATA

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

QC Batch: 545453 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010 Analysis Description: 6010D Water
Associated Lab Samples: 10435734002, 10435734003, 10435734004, 10435734005, 10435734006, 10435734007

METHOD BLANK: 2965944 Matrix: Water
Associated Lab Samples: 10435734002, 10435734003, 10435734004, 10435734005, 10435734006, 10435734007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Manganese	ug/L	ND	5.0	06/20/18 11:05	

LABORATORY CONTROL SAMPLE: 2965945

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	1000	1060	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2965946 2965947

Parameter	Units	10435902001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese	ug/L	ND	1000	1000	1030	1020	103	102	75-125	1	20	

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QUALITY CONTROL DATA

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

QC Batch: 546021 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010 Analysis Description: 6010D Water Dissolved
Associated Lab Samples: 10435734002, 10435734003, 10435734004, 10435734005, 10435734006, 10435734007

METHOD BLANK: 2968933 Matrix: Water
Associated Lab Samples: 10435734002, 10435734003, 10435734004, 10435734005, 10435734006, 10435734007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	06/21/18 14:39	

LABORATORY CONTROL SAMPLE: 2968934

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	1000	1050	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2968935 2968936

Parameter	Units	10435734002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	ND	1000	1000	1060	1060	106	106	75-125	0	20	

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QUALITY CONTROL DATA

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

QC Batch: 545744 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10435734002, 10435734003, 10435734004, 10435734005, 10435734006, 10435734007

METHOD BLANK: 2967535 Matrix: Water
Associated Lab Samples: 10435734002, 10435734003, 10435734004, 10435734005, 10435734006, 10435734007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Hydroxide (CaCO3)	mg/L	ND	5.0	06/20/18 07:54	
Alkalinity, Total as CaCO3	mg/L	ND	5.0	06/20/18 07:54	
Alkalinity,Bicarbonate (CaCO3)	mg/L	ND	5.0	06/20/18 07:54	
Alkalinity,Carbonate (CaCO3)	mg/L	ND	5.0	06/20/18 07:54	

LABORATORY CONTROL SAMPLE & LCSD: 2967536 2967537

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	42.2	42.3	105	106	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2967538 2967539

Parameter	Units	10435948001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	122	40	40	161	163	98	104	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2967540 2967541

Parameter	Units	10435948002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	123	40	40	160	166	92	105	80-120	3	30	

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QUALITY CONTROL DATA

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

QC Batch: 545832 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10435734002, 10435734003, 10435734004, 10435734005, 10435734006, 10435734007

METHOD BLANK: 2967779 Matrix: Water
Associated Lab Samples: 10435734002, 10435734003, 10435734004, 10435734005, 10435734006, 10435734007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	06/20/18 11:28	

LABORATORY CONTROL SAMPLE: 2967780

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2967781 2967782

Parameter	Units	10435734002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.83	1	1	1.9	1.8	103	98	90-110	3	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2967783 2967784

Parameter	Units	10435734003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.14	1	1	1.1	1.1	100	99	90-110	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Vincent Road Landfill GW
Pace Project No.: 10435734

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10435734002	**BMW-12**	EPA 3010	545453	EPA 6010D	545825
10435734003	**BMW-13**	EPA 3010	545453	EPA 6010D	545825
10435734004	**BMW-14**	EPA 3010	545453	EPA 6010D	545825
10435734005	**BMW-114**	EPA 3010	545453	EPA 6010D	545825
10435734006	**BMW-15**	EPA 3010	545453	EPA 6010D	545825
10435734007	**BOW-37**	EPA 3010	545453	EPA 6010D	545825
10435734002	**BMW-12**	EPA 3010	546021	EPA 6010D	546184
10435734003	**BMW-13**	EPA 3010	546021	EPA 6010D	546184
10435734004	**BMW-14**	EPA 3010	546021	EPA 6010D	546184
10435734005	**BMW-114**	EPA 3010	546021	EPA 6010D	546184
10435734006	**BMW-15**	EPA 3010	546021	EPA 6010D	546184
10435734007	**BOW-37**	EPA 3010	546021	EPA 6010D	546184
10435734002	**BMW-12**	SM 2320B	545744		
10435734003	**BMW-13**	SM 2320B	545744		
10435734004	**BMW-14**	SM 2320B	545744		
10435734005	**BMW-114**	SM 2320B	545744		
10435734006	**BMW-15**	SM 2320B	545744		
10435734007	**BOW-37**	SM 2320B	545744		
10435734002	**BMW-12**	EPA 353.2	545832		
10435734003	**BMW-13**	EPA 353.2	545832		
10435734004	**BMW-14**	EPA 353.2	545832		
10435734005	**BMW-114**	EPA 353.2	545832		
10435734006	**BMW-15**	EPA 353.2	545832		
10435734007	**BOW-37**	EPA 353.2	545832		

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Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

WO# : 10435734

10435734

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	City of Bainbridge Island	Report To:	Aaron Claiborne	Attention:	Accounts Payable
Address:	7305 Hidden Cove Road	Copy To:		Company Name:	City of Bainbridge Island
	Bainbridge Island, Wa 98110			Address:	280 Madison Ave NE, WA 98110
Email To:	aclaiborne@bainbridgewa.gov	Purchase Order No.		Pace Quote Reference:	
Phone:	206.780.3585 M 206.571.9853	Client Project ID:	Vincent Road Landfill GW	Pace Project Manager:	Jared Dickinson
Requested Due Date/TAT:	10 Day (Standard)	Container Order Number:		Pace Profile #:	33777 # 1

State / Location: Bainbridge Island, WA

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

MATRIX	CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Other	OT
Tissue	TS

Requested Analysis Filtered (Y/N)

ITEM#	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	8260 SIM -Vinyl Chloride & 1,1-DCE*	6010 Total Mn	6010 Dissolved Mn (Lab Filter)	300.0 Nitrate/Nitrite/Sulfate/Chloride*	353.2 Nitrate+Nitrite	SM2320 Alkalinity (Total/Bicarb/Carb/-Hydroxide)	Residual Chlorine (Y/N)	
1	Trip Blank	OT	G						2				2						X							
2	BMW - 12	WT	G	6-15	6:20				8	3	1	1	3						X	X	X	X	X	X		001
3	BMW - 13	WT	G	6-15	7:30				8	3	1	1	3						X	X	X	X	X	X		002
4	BMW - 14	WT	G	6-15	8:35				8	3	1	1	3						X	X	X	X	X	X		003
5	BMW - 114	WT	G	6-15	9:35				8	3	1	1	3						X	X	X	X	X	X		004
6	BMW - 15	WT	G	6-15	9:32				8	3	1	1	3						X	X	X	X	X	X		005
7	BOW - 37	WT	G	6-15	10:20				8	3	1	1	3						X	X	X	X	X	X		006
8		WT	G						8	3	1	1	3													007
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*8260 and 300.0 were subbed to Fremont Analytical	ROBERT GOLDEN	6-15-18	1222	PACE	6/15/18	1222	9.0	Y	Y	Y
					6/16/18	9:10	3.3			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ROBERT A. GOLDEN

SIGNATURE of SAMPLER: Robert A Golden

DATE Signed: 6-15-2018

TEMP in C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 02May2018 Page 1 of 2
	Document No.: **F-MN-L-213-rev.23**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: City of Bainbridge Island

Project #: **WO#: 10435734**

PM: JDD **Due Date:** 06/22/18

CLIENT: COBI

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

Tracking Number: 7475 9640 7584

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other: **Temp Blank?** ☑ Yes ☐ No

Thermometer Used: ☐ G87A9170600254 ☑ G87A9155100842 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Cooler Temp Read (°C): 3.3 **Cooler Temp Corrected (°C):** 3.3 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** True **Date and Initials of Person Examining Contents:** 6/6/18 LJ

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No		1.
Chain of Custody Filled Out?	☑ Yes	☐ No		2.
Chain of Custody Relinquished?	☑ Yes	☐ No		3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No		5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		6.
Rush Turn Around Time Requested?	☐ Yes	☑ No		7.
Sufficient Volume?	☑ Yes	☐ No		8.
Correct Containers Used?	☑ Yes	☐ No		9.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		10. 6/19/18 LJ
Filtered Volume Received for Dissolved Tests?	☐ Yes	☑ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Is sufficient information available to reconcile the samples to the COC? Matrix: WT	☑ Yes	☐ No		12.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13. ☑ HNO_3 ☑ H_2SO_4 ☐ NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	Sample # 2-7:1/1, 2-7:1/1
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐ Yes	☐ No	☑ N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: **Date:** 6/20/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 02May2018 Page 1 of 2
	Document No.: F-MN-L-213-rev.23	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: City of Bainbridge Island

Project #: WO#: 10435734

PM: JDD Due Date: 06/22/18

CLIENT: COBI

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

Tracking Number: 7975 9640 7584

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other: **Temp Blank?** ☑ Yes ☐ No

Thermometer Used: ☐ G87A9170600254 ☑ G87A9155100842 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Cooler Temp Read (°C): 3.3 **Cooler Temp Corrected (°C):** 3.3 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** True **Date and Initials of Person Examining Contents:** 6/16/18, LS

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No		1.
Chain of Custody Filled Out?	☑ Yes	☐ No		2.
Chain of Custody Relinquished?	☑ Yes	☐ No		3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No		5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		6.
Rush Turn Around Time Requested?	☐ Yes	☑ No		7.
Sufficient Volume?	☑ Yes	☐ No		8.
Correct Containers Used?	☑ Yes	☐ No		9.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Is sufficient information available to reconcile the samples to the COC? Matrix: WT	☑ Yes	☐ No		12.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13. ☑ HNO_3 ☑ H_2SO_4 ☐ NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☐ No	☐ N/A	Sample # 2-7:1/1, 2-7:1/1
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐ Yes	☐ No	☑ N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Date: 6/18/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Pace Analytical Seattle
Jennifer Gross
940 South Harney
Seattle, WA 98108

RE: Vincent Road Landfill GW
Work Order Number: 1806189

June 22, 2018

Attention Jennifer Gross:

Fremont Analytical, Inc. received 7 sample(s) on 6/15/2018 for the analyses presented in the following report.

Ion Chromatography by EPA Method 300.0
Volatile Organic Compounds by EPA Method 8260 SIM

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Chelsea Ward
Project Manager

Date: *06/22/2018*

CLIENT: Pace Analytical Seattle
Project: Vincent Road Landfill GW
Work Order: 1806189

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1806189-001	Trip Blank	06/15/2018 12:00 AM	06/15/2018 12:59 PM
1806189-002	BMW-12	06/15/2018 6:20 AM	06/15/2018 12:59 PM
1806189-003	BMW-13	06/15/2018 7:30 AM	06/15/2018 12:59 PM
1806189-004	BMW-14	06/15/2018 8:35 AM	06/15/2018 12:59 PM
1806189-005	BMW-114	06/15/2018 8:35 AM	06/15/2018 12:59 PM
1806189-006	BMW-15	06/15/2018 9:32 AM	06/15/2018 12:59 PM
1806189-007	BOW-37	06/15/2018 10:20 AM	06/15/2018 12:59 PM

Case Narrative

WO#: **1806189**

Date: **6/22/2018**

CLIENT: Pace Analytical Seattle

Project: Vincent Road Landfill GW

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **1806189**
Date Reported: **6/22/2018**

Client: Pace Analytical Seattle
Collection Date: 6/15/2018
Project: Vincent Road Landfill GW
Lab ID: 1806189-001
Matrix: Water
Client Sample ID: **Trip Blank**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260 SIM				Batch ID: 21014		Analyst: MW
Vinyl chloride	ND	0.0100		µg/L	1	6/20/2018 8:34:34 PM
1,1-DCE	ND	0.0100		µg/L	1	6/20/2018 8:34:34 PM
Surr: Dibromofluoromethane	101	68 - 140		%Rec	1	6/20/2018 8:34:34 PM
Surr: Toluene-d8	99.2	63.5 - 144		%Rec	1	6/20/2018 8:34:34 PM
Surr: 4-Bromofluorobenzene	99.6	55 - 134		%Rec	1	6/20/2018 8:34:34 PM

Analytical Report

Work Order: **1806189**
Date Reported: **6/22/2018**

Client: Pace Analytical Seattle
Collection Date: 6/15/2018 6:20:00 AM
Project: Vincent Road Landfill GW
Lab ID: 1806189-002
Matrix: Water
Client Sample ID: **BMW-12**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260 SIM				Batch ID: 21014		Analyst: MW
Vinyl chloride	ND	0.0100		µg/L	1	6/20/2018 10:17:27 PM
1,1-DCE	ND	0.0100		µg/L	1	6/20/2018 10:17:27 PM
Surr: Dibromofluoromethane	102	68 - 140		%Rec	1	6/20/2018 10:17:27 PM
Surr: Toluene-d8	99.5	63.5 - 144		%Rec	1	6/20/2018 10:17:27 PM
Surr: 4-Bromofluorobenzene	99.9	55 - 134		%Rec	1	6/20/2018 10:17:27 PM
Ion Chromatography by EPA Method 300.0				Batch ID: R44108		Analyst: KT
Chloride	3.19	0.200	D	mg/L	2	6/15/2018 3:02:00 PM
Nitrogen, Nitrite	ND	0.100		mg/L	1	6/15/2018 6:40:00 PM
Nitrogen, Nitrate	0.800	0.100		mg/L	1	6/15/2018 6:40:00 PM
Sulfate	6.74	0.300		mg/L	1	6/15/2018 6:40:00 PM

Analytical Report

Work Order: **1806189**
Date Reported: **6/22/2018**

Client: Pace Analytical Seattle
Collection Date: 6/15/2018 7:30:00 AM
Project: Vincent Road Landfill GW
Lab ID: 1806189-003
Matrix: Water
Client Sample ID: **BMW-13**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260 SIM				Batch ID: 21014		Analyst: MW
Vinyl chloride	ND	0.0100		µg/L	1	6/20/2018 10:53:14 PM
1,1-DCE	ND	0.0100		µg/L	1	6/20/2018 10:53:14 PM
Surr: Dibromofluoromethane	102	68 - 140		%Rec	1	6/20/2018 10:53:14 PM
Surr: Toluene-d8	101	63.5 - 144		%Rec	1	6/20/2018 10:53:14 PM
Surr: 4-Bromofluorobenzene	99.8	55 - 134		%Rec	1	6/20/2018 10:53:14 PM
Ion Chromatography by EPA Method 300.0				Batch ID: R44108		Analyst: KT
Chloride	7.75	0.400	D	mg/L	4	6/15/2018 3:35:00 PM
Nitrogen, Nitrite	ND	0.100		mg/L	1	6/15/2018 8:13:00 PM
Nitrogen, Nitrate	0.152	0.100		mg/L	1	6/15/2018 8:13:00 PM
Sulfate	19.0	1.20	D	mg/L	4	6/15/2018 3:35:00 PM

Analytical Report

Work Order: **1806189**
Date Reported: **6/22/2018**

Client: Pace Analytical Seattle
Collection Date: 6/15/2018 8:35:00 AM
Project: Vincent Road Landfill GW
Lab ID: 1806189-004
Matrix: Water
Client Sample ID: **BMW-14**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260 SIM				Batch ID: 21014		Analyst: MW
Vinyl chloride	ND	0.0100		µg/L	1	6/20/2018 11:28:52 PM
1,1-DCE	ND	0.0100		µg/L	1	6/20/2018 11:28:52 PM
Surr: Dibromofluoromethane	100	68 - 140		%Rec	1	6/20/2018 11:28:52 PM
Surr: Toluene-d8	99.2	63.5 - 144		%Rec	1	6/20/2018 11:28:52 PM
Surr: 4-Bromofluorobenzene	96.6	55 - 134		%Rec	1	6/20/2018 11:28:52 PM
Ion Chromatography by EPA Method 300.0				Batch ID: R44108		Analyst: KT
Chloride	10.5	0.500	D	mg/L	5	6/15/2018 3:59:00 PM
Nitrogen, Nitrite	ND	0.200	D	mg/L	2	6/15/2018 7:27:00 PM
Nitrogen, Nitrate	ND	0.200	D	mg/L	2	6/15/2018 7:27:00 PM
Sulfate	24.5	0.600	D	mg/L	2	6/15/2018 7:27:00 PM

Analytical Report

Work Order: **1806189**
Date Reported: **6/22/2018**

Client: Pace Analytical Seattle
Collection Date: 6/15/2018 8:35:00 AM
Project: Vincent Road Landfill GW
Lab ID: 1806189-005
Matrix: Water
Client Sample ID: **BMW-114**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260 SIM				Batch ID: 21014		Analyst: MW
Vinyl chloride	ND	0.0100		µg/L	1	6/21/2018 12:04:24 AM
1,1-DCE	ND	0.0100		µg/L	1	6/21/2018 12:04:24 AM
Surr: Dibromofluoromethane	102	68 - 140		%Rec	1	6/21/2018 12:04:24 AM
Surr: Toluene-d8	101	63.5 - 144		%Rec	1	6/21/2018 12:04:24 AM
Surr: 4-Bromofluorobenzene	96.1	55 - 134		%Rec	1	6/21/2018 12:04:24 AM
Ion Chromatography by EPA Method 300.0				Batch ID: R44108		Analyst: KT
Chloride	10.3	1.00	D	mg/L	10	6/15/2018 4:22:00 PM
Nitrogen, Nitrite	ND	0.200	D	mg/L	2	6/15/2018 7:50:00 PM
Nitrogen, Nitrate	ND	0.200	D	mg/L	2	6/15/2018 7:50:00 PM
Sulfate	27.9	0.600	D	mg/L	2	6/15/2018 7:50:00 PM

Analytical Report

Work Order: **1806189**
Date Reported: **6/22/2018**

Client: Pace Analytical Seattle
Collection Date: 6/15/2018 9:32:00 AM
Project: Vincent Road Landfill GW
Lab ID: 1806189-006
Matrix: Water
Client Sample ID: **BMW-15**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260 SIM				Batch ID: 21014		Analyst: MW
Vinyl chloride	ND	0.0100		µg/L	1	6/21/2018 12:39:52 AM
1,1-DCE	ND	0.0100		µg/L	1	6/21/2018 12:39:52 AM
Surr: Dibromofluoromethane	102	68 - 140		%Rec	1	6/21/2018 12:39:52 AM
Surr: Toluene-d8	99.7	63.5 - 144		%Rec	1	6/21/2018 12:39:52 AM
Surr: 4-Bromofluorobenzene	98.0	55 - 134		%Rec	1	6/21/2018 12:39:52 AM
Ion Chromatography by EPA Method 300.0				Batch ID: R44108		Analyst: KT
Chloride	18.9	1.00	D	mg/L	10	6/15/2018 4:45:00 PM
Nitrogen, Nitrite	ND	0.500	D	mg/L	5	6/15/2018 7:04:00 PM
Nitrogen, Nitrate	0.785	0.500	D	mg/L	5	6/15/2018 7:04:00 PM
Sulfate	72.9	1.50	D	mg/L	5	6/15/2018 7:04:00 PM

Page 10 of 39

Analytical Report

Work Order: **1806189**
Date Reported: **6/22/2018**

Client: Pace Analytical Seattle
Collection Date: 6/15/2018 10:20:00 AM
Project: Vincent Road Landfill GW
Lab ID: 1806189-007
Matrix: Water
Client Sample ID: **BOW-37**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260 SIM				Batch ID: 21014		Analyst: MW
Vinyl chloride	ND	0.0100		µg/L	1	6/21/2018 1:15:21 AM
1,1-DCE	ND	0.0100		µg/L	1	6/21/2018 1:15:21 AM
Surr: Dibromofluoromethane	102	68 - 140		%Rec	1	6/21/2018 1:15:21 AM
Surr: Toluene-d8	101	63.5 - 144		%Rec	1	6/21/2018 1:15:21 AM
Surr: 4-Bromofluorobenzene	98.2	55 - 134		%Rec	1	6/21/2018 1:15:21 AM
Ion Chromatography by EPA Method 300.0				Batch ID: R44210		Analyst: KT
Chloride	5.74	0.400	D	mg/L	4	6/20/2018 12:02:00 AM
Nitrogen, Nitrite	ND	0.100		mg/L	1	6/15/2018 6:17:00 PM
Nitrogen, Nitrate	2.46	0.100		mg/L	1	6/15/2018 6:17:00 PM
Sulfate	9.27	0.300		mg/L	1	6/15/2018 6:17:00 PM

Page 11 of 39

Work Order: 1806189
CLIENT: Pace Analytical Seattle
Project: Vincent Road Landfill GW

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **MB-R44108** SampType: **MBLK** Units: **mg/L** Prep Date: **6/15/2018** RunNo: **44108**
Client ID: **MBLKW** Batch ID: **R44108** Analysis Date: **6/15/2018** SeqNo: **853739**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									
Nitrogen, Nitrite	ND	0.100									
Nitrogen, Nitrate	ND	0.100									
Sulfate	ND	0.300									

Sample ID **LCS-R44108** SampType: **LCS** Units: **mg/L** Prep Date: **6/15/2018** RunNo: **44108**
Client ID: **LCSW** Batch ID: **R44108** Analysis Date: **6/15/2018** SeqNo: **853740**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.697	0.100	0.7500	0	92.9	90	110				
Nitrogen, Nitrite	0.714	0.100	0.7500	0	95.2	90	110				
Nitrogen, Nitrate	0.699	0.100	0.7500	0	93.2	90	110				
Sulfate	3.53	0.300	3.750	0	94.1	90	110				

Sample ID **1806147-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **6/15/2018** RunNo: **44108**
Client ID: **BATCH** Batch ID: **R44108** Analysis Date: **6/15/2018** SeqNo: **853715**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	3.06	0.200						3.036	0.657	20	D
Nitrogen, Nitrite	ND	0.200						0	0	20	D
Nitrogen, Nitrate	0.360	0.200						0.3580	0.557	20	D
Sulfate	3.55	0.600						3.526	0.566	20	D

Sample ID **1806147-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **6/15/2018** RunNo: **44108**
Client ID: **BATCH** Batch ID: **R44108** Analysis Date: **6/15/2018** SeqNo: **853716**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	4.63	0.200	1.500	3.036	106	80	120				D
Nitrogen, Nitrite	1.43	0.200	1.500	0	95.1	80	120				D

Work Order: 1806189
CLIENT: Pace Analytical Seattle
Project: Vincent Road Landfill GW

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID	**1806147-001BMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **6/15/2018**		RunNo: **44108**		
Client ID:	**BATCH**	Batch ID: **R44108**					Analysis Date: **6/15/2018**		SeqNo: **853716**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate	1.74	0.200	1.500	0.3580	91.9	80	120				D
Sulfate	10.7	0.600	7.500	3.526	96.2	80	120				D

Sample ID	**1806147-001BMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **6/15/2018**		RunNo: **44108**		
Client ID:	**BATCH**	Batch ID: **R44108**					Analysis Date: **6/15/2018**		SeqNo: **853717**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	4.63	0.200	1.500	3.036	106	80	120	4.628	0.0432	20	D
Nitrogen, Nitrite	1.42	0.200	1.500	0	94.9	80	120	1.426	0.140	20	D
Nitrogen, Nitrate	1.74	0.200	1.500	0.3580	92.0	80	120	1.736	0.115	20	D
Sulfate	10.8	0.600	7.500	3.526	96.4	80	120	10.74	0.112	20	D

Sample ID	**LCS-R44210**	SampType: **LCS**			Units: **mg/L**		Prep Date: **6/19/2018**		RunNo: **44210**		
Client ID:	**LCSW**	Batch ID: **R44210**					Analysis Date: **6/19/2018**		SeqNo: **855529**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.698	0.100	0.7500	0	93.1	90	110				

Sample ID	**MB-R44210**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **6/19/2018**		RunNo: **44210**		
Client ID:	**MBLKW**	Batch ID: **R44210**					Analysis Date: **6/19/2018**		SeqNo: **855530**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									

Sample ID	**1806201-001BDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **6/20/2018**		RunNo: **44210**		
Client ID:	**BATCH**	Batch ID: **R44210**					Analysis Date: **6/20/2018**		SeqNo: **855541**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	60.0	0.400						61.47	2.48	20	ED

Work Order: 1806189
CLIENT: Pace Analytical Seattle
Project: Vincent Road Landfill GW

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID	**1806201-001BDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **6/20/2018**		RunNo: **44210**		
Client ID:	**BATCH**	Batch ID: **R44210**					Analysis Date: **6/20/2018**		SeqNo: **855541**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID	**1806201-001BMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **6/20/2018**		RunNo: **44210**		
Client ID:	**BATCH**	Batch ID: **R44210**					Analysis Date: **6/20/2018**		SeqNo: **855542**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	62.5	0.400	3.000	61.47	34.5	80	120				ESD

NOTES:
S - Chloride concentration was too high for accurate spike recovery(ies).

Sample ID	**1806201-001BMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **6/20/2018**		RunNo: **44210**		
Client ID:	**BATCH**	Batch ID: **R44210**					Analysis Date: **6/20/2018**		SeqNo: **855543**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	62.5	0.400	3.000	61.47	35.6	80	120	62.51	0.0512	20	ESD

NOTES:
S - Chloride concentration was too high for accurate spike recovery(ies).

Work Order: 1806189
CLIENT: Pace Analytical Seattle
Project: Vincent Road Landfill GW

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260 SIM

Sample ID **LCS-21014**	SampType: **LCS**	Units: **µg/L**	Prep Date: **6/19/2018**	RunNo: **44189**
Client ID: **LCSW**	Batch ID: **21014**		Analysis Date: **6/20/2018**	SeqNo: **855084**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	5.47	0.0100	5.000	0	109	56.3	134				
1,1-DCE	6.03	0.0100	5.000	0	121	51.5	142				
Surr: Dibromofluoromethane	9.99		10.00		99.9	68	140				
Surr: Toluene-d8	10.2		10.00		102	63.5	144				
Surr: 4-Bromofluorobenzene	10.2		10.00		102	55	134				

Sample ID **LCSD-21014**	SampType: **LCSD**	Units: **µg/L**	Prep Date: **6/19/2018**	RunNo: **44189**
Client ID: **LCSW02**	Batch ID: **21014**		Analysis Date: **6/20/2018**	SeqNo: **855083**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	5.10	0.0100	5.000	0	102	56.3	134	5.469	6.93	20	
1,1-DCE	5.63	0.0100	5.000	0	113	51.5	142	6.033	6.97	20	
Surr: Dibromofluoromethane	10.1		10.00		101	68	140		0		
Surr: Toluene-d8	10.1		10.00		101	63.5	144		0		
Surr: 4-Bromofluorobenzene	10.3		10.00		103	55	134		0		

Sample ID **MB-21014**	SampType: **MBLK**	Units: **µg/L**	Prep Date: **6/19/2018**	RunNo: **44189**
Client ID: **MBLKW**	Batch ID: **21014**		Analysis Date: **6/20/2018**	SeqNo: **855085**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100									
1,1-DCE	ND	0.0100									
Surr: Dibromofluoromethane	9.96		10.00		99.6	68	140				
Surr: Toluene-d8	9.90		10.00		99.0	63.5	144				
Surr: 4-Bromofluorobenzene	10.3		10.00		103	55	134				

Work Order: 1806189
CLIENT: Pace Analytical Seattle
Project: Vincent Road Landfill GW

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260 SIM

Sample ID **1806189-003ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **6/19/2018** RunNo: **44189**
Client ID: **BMW-13** Batch ID: **21014** Analysis Date: **6/21/2018** SeqNo: **855075**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100						0	0	30	
1,1-DCE	ND	0.0100						0	0	30	
Surr: Dibromofluoromethane	10.2		10.00		102	68	140		0		
Surr: Toluene-d8	10.1		10.00		101	63.5	144		0		
Surr: 4-Bromofluorobenzene	9.91		10.00		99.1	55	134		0		

Sample Log-In Check List

Client Name:	**PACE**	Work Order Number:	**1806189**
Logged by:	**Clare Griggs**	Date Received:	**6/15/2018 12:59:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☐	No ☑	Not Present ☐
2.	How was the sample delivered?	Client		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☐	No ☑	NA ☐
		Refer to item information.		
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☑	No ☐	NA ☐

Person Notified:	Jared Dickinson	Date	6/15/2018
By Whom:	Clare Griggs	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Confirming COC & Trip Blank.		
Client Instructions:	Client provided updated COC. Trip Blank for VOCs only.		

19. Additional remarks:

Item Information

Item #	Temp °C
Cooler	16.3
Sample	13.6
Temp Blank	14.9

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Page 17 of 39

Chain of Custody

1806189

Pace Analytical
www.pacelabs.com

Workorder: 10435734 **Workorder Name:** Vincent Road Landfill GW **Results Requested By:** 6/22/2018

Report / Invoice To	Subcontract To
Jared Dickinson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Email: jared.dickinson@pacelabs.com	P.O._____

State of Sample Origin: WA

Item	Sample ID	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HCL	Preserved Containers: Unpreserved	Requested Analysis: 8260 SIM Vinyl Chloride, 1,1 DCE	Requested Analysis: 3000. Nitrate/nitrite/sulf/Cl	LAB USE ONLY
1	Trip Blank	6/15/2018 00:00	10435734001	Water			X	X	
2	BMW-12	6/15/2018 06:20	10435734002	Water			X	X	
3	BMW-13	6/15/2018 07:30	10435734003	Water			X	X	
4	BMW-14	6/15/2018 08:35	10435734004	Water			X	X	
5	BMW-114	6/15/2018 08:35	10435734005	Water			X	X	
6	BMW-15	6/15/2018 09:32	10435734006	Water			X	X	
7	BOW-37	6/15/2018 10:20	10435734007	Water			X	X	

Comments

Transfers	Released By	Date/Time	Received By	Date/Time
1			[signature]	6/15/18 1343
2				
3				

Cooler Temperature on Receipt _____ °C | **Custody Seal** Y or N | **Received on Ice** Y or N | **Samples Intact** Y or N

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

180 6189

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	City of Bainbridge Island	Report To:	Aaron Claiborne	Attention:	Accounts Payable
Address:	7305 Hidden Cove Road	Copy To:		Company Name:	City of Bainbridge Island
	Bainbridge Island, Wa 98110			Address:	280 Madison Ave NE, WA 98110
Email To:	aclaiborne@bainbridgewa.gov	Purchase Order No.		Pace Quote Reference:	
Phone:	206.780.3585 M 206.571.9853	Client Project ID:	Vincent Road Landfill GW	Pace Project Manager:	Jared Dickinson
Requested Due Date/TAT:	10 Day (Standard)	Container Order Number:		Pace Profile #:	33777 # 1

Regulatory Agency
State / Location
Bainbridge Island, WA

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

MATRIX	CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Other	OT
Tissue	TS

ITEM#	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	8260 SIM -Vinyl Chloride & 1,1-DCE*	6010 Total Mn	6010 Dissolved Mn (Lab Filter)	300.0 Nitrate/Nitrite/Sulfate/Chloride*	353.2 Nitrate+Nitrite	SM2320 Alkalinity (Total/Bicarb/Carb/Hydroxide)	Residual Chlorine (Y/N)
1	Trip Blank	OT	G						2				2						X						
2	BMW-12	WT	G	6-5	7:10				8	3	1	1	3						X	X	X	X	X	X	
3	BMW-13	WT	G	6-5	9:30				8	3	1	1	3						X	X	X	X	X	X	
4	BMW-111	WT	G	6-5	7:10				8	3	1	1	3						X	X	X	X	X	X	
5	BMW-111	WT	G	6-5	8:35				8	3	1	1	3						X	X	X	X	X	X	
6	BMW-15	WT	G	6-5	7:32				8	3	1	1	3						X	X	X	X	X	X	
7	BOW-37	WT	G	6-5	8:10				8	3	1	1	3						X	X	X	X	X	X	
8		WT	G						8	3	1	1	3												
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*8260 and 300.0 were subbed to Fremont Analytical	ROBERT GIDDEN	6/5/18	1200		6/5/18	1202	
	PACE	6-5-18	1259				
		6/5/18	1259				

SAMPLER NAME AND SIGNATURE					
PRINT Name of SAMPLER:	ROBERT E. GIDDEN				
SIGNATURE of SAMPLER:		DATE Signed:	6.15.2018		

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Road Storm Water
Work Order Number: 1812315

December 31, 2018

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 2 sample(s) on 12/20/2018 for the analyses presented in the following report.

Dissolved Metals by EPA Method 6020
Fecal Coliform by SM 9222D
Total Alkalinity by SM 2320B
Total Coliform by EPA Method 1604
Total Metals by EPA Method 6020

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

Date: *12/31/2018*

CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water
Work Order: 1812315

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1812315-001	SWU-1	12/20/2018 9:50 AM	12/20/2018 12:50 PM
1812315-002	SWD-1	12/20/2018 10:15 AM	12/20/2018 12:50 PM

Case Narrative

WO#: **1812315**
Date: **12/31/2018**

CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Analytical Report

Work Order: **1812315**
Date Reported: **12/31/2018**

Client: City of Bainbridge Island
Collection Date: 12/20/2018 9:50:00 AM
Project: Vincent Road Storm Water
Lab ID: 1812315-001
Matrix: Stormwater
Client Sample ID: **SWU-1**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Fecal Coliform by SM 9222D				Batch ID: R48505		Analyst: ME
Coliform, Fecal	150	10.0	DH	CFU/100ml	10	12/20/2018 4:21:00 PM
Total Coliform by EPA Method 1604				Batch ID: R48504		Analyst: ME
Coliform, Total	1,900	100	DH	CFU/100ml	100	12/20/2018 4:45:00 PM
E. coli	500	100	DH	CFU/100ml	100	12/20/2018 4:45:00 PM
Dissolved Metals by EPA Method 6020				Batch ID: 23094		Analyst: WC
Copper	1.46	0.500		µg/L	1	12/28/2018 7:26:29 PM
Iron	370	100		µg/L	1	12/28/2018 7:26:29 PM
Lead	ND	1.00		µg/L	1	12/28/2018 7:26:29 PM
Zinc	ND	3.50		µg/L	1	12/28/2018 7:26:29 PM
Total Metals by EPA Method 6020				Batch ID: 23086		Analyst: WC
Iron	690	100		µg/L	1	12/28/2018 10:51:56 PM
Total Alkalinity by SM 2320B				Batch ID: R48559		Analyst: ME
Alkalinity, Total (As CaCO3)	10.6	2.50		mg/L	1	12/26/2018 9:50:00 AM

Analytical Report

Work Order: **1812315**
Date Reported: **12/31/2018**

Client: City of Bainbridge Island
Collection Date: 12/20/2018 10:15:00 AM
Project: Vincent Road Storm Water
Lab ID: 1812315-002
Matrix: Stormwater
Client Sample ID: **SWD-1**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Fecal Coliform by SM 9222D				Batch ID: R48505		Analyst: ME
Coliform, Fecal	1,420	10.0	DH	CFU/100ml	10	12/20/2018 4:21:00 PM
Total Coliform by EPA Method 1604				Batch ID: R48504		Analyst: ME
Coliform, Total	40,200	100	DH	CFU/100ml	100	12/20/2018 4:45:00 PM
E. coli	10,200	100	DH	CFU/100ml	100	12/20/2018 4:45:00 PM
Dissolved Metals by EPA Method 6020				Batch ID: 23094		Analyst: WC
Copper	5.41	0.500		µg/L	1	12/28/2018 7:46:35 PM
Iron	272	100		µg/L	1	12/28/2018 7:46:35 PM
Lead	ND	1.00		µg/L	1	12/28/2018 7:46:35 PM
Zinc	ND	3.50		µg/L	1	12/28/2018 7:46:35 PM
Total Metals by EPA Method 6020				Batch ID: 23086		Analyst: WC
Iron	2,410	100		µg/L	1	12/28/2018 11:24:11 PM
Total Alkalinity by SM 2320B				Batch ID: R48559		Analyst: ME
Alkalinity, Total (As CaCO3)	17.0	2.50		mg/L	1	12/26/2018 9:50:00 AM

Work Order: 1812315
CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

QC SUMMARY REPORT

Fecal Coliform by SM 9222D

Sample ID	**MB-R48505**	SampType:	**MBLK**	Units:	**CFU/100ml**	Prep Date:	**12/20/2018**	RunNo:	**48505**
Client ID:	**MBLKW**	Batch ID:	**R48505**			Analysis Date:	**12/20/2018**	SeqNo:	**950250**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Coliform, Fecal	ND	1.00									

Work Order: 1812315
CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

QC SUMMARY REPORT

Total Coliform by EPA Method 1604

Sample ID	**MB-R48504**	SampType:	**MBLK**	Units:	**CFU/100ml**	Prep Date:	**12/20/2018**	RunNo:	**48504**
Client ID:	**MBLKW**	Batch ID:	**R48504**			Analysis Date:	**12/20/2018**	SeqNo:	**950246**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Coliform, Total	ND	1.00									
E. coli	ND	1.00									

Work Order: 1812315
CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID	**MB-R48559**	SampType:	**MBLK**			Units:	**mg/L**	Prep Date:	**12/26/2018**	RunNo:	**48559**	
Client ID:	**MBLKW**	Batch ID:	**R48559**					Analysis Date:	**12/26/2018**	SeqNo:	**951775**	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)		ND	2.50									

Sample ID	**LCS-R48559**	SampType:	**LCS**			Units:	**mg/L**	Prep Date:	**12/26/2018**	RunNo:	**48559**	
Client ID:	**LCSW**	Batch ID:	**R48559**					Analysis Date:	**12/26/2018**	SeqNo:	**951776**	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)		104	2.50	100.0	0	104	80	120				

Sample ID	**1812240-001BDUP**	SampType:	**DUP**			Units:	**mg/L**	Prep Date:	**12/26/2018**	RunNo:	**48559**	
Client ID:	**BATCH**	Batch ID:	**R48559**					Analysis Date:	**12/26/2018**	SeqNo:	**951778**	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)		99.5	2.50						102.6	3.08	20	

Sample ID	**1812315-002CDUP**	SampType:	**DUP**			Units:	**mg/L**	Prep Date:	**12/26/2018**	RunNo:	**48559**	
Client ID:	**SWD-1**	Batch ID:	**R48559**					Analysis Date:	**12/26/2018**	SeqNo:	**951791**	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)		17.4	2.50						16.99	2.44	20	

Work Order: 1812315
CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

QC SUMMARY REPORT

Dissolved Metals by EPA Method 6020

Sample ID	MB-23094	SampType:	MBLK	Units:	µg/L	Prep Date:	12/27/2018	RunNo:	48644
Client ID:	MBLKW	Batch ID:	23094			Analysis Date:	12/28/2018	SeqNo:	953760

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	0.500									
Iron	ND	100									
Lead	ND	1.00									
Zinc	ND	3.50									

Sample ID	LCS-23094	SampType:	LCS	Units:	µg/L	Prep Date:	12/27/2018	RunNo:	48644
Client ID:	LCSW	Batch ID:	23094			Analysis Date:	12/28/2018	SeqNo:	953761

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	106	0.500	100.0	0	106	80	120				
Iron	1,070	100	1,000	0	107	80	120				
Lead	53.3	1.00	50.00	0	107	80	120				
Zinc	104	3.50	100.0	0	104	80	120				

Sample ID	1812315-001BDUP	SampType:	DUP	Units:	µg/L	Prep Date:	12/27/2018	RunNo:	48644
Client ID:	SWU-1	Batch ID:	23094			Analysis Date:	12/28/2018	SeqNo:	953763

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	1.34	0.500						1.459	8.77	20	
Iron	405	100						370.2	8.88	20	
Lead	ND	1.00						0		20	
Zinc	ND	3.50						0		20	

Sample ID	1812315-001BMS	SampType:	MS	Units:	µg/L	Prep Date:	12/27/2018	RunNo:	48644
Client ID:	SWU-1	Batch ID:	23094			Analysis Date:	12/28/2018	SeqNo:	953765

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	516	0.500	500.0	1.459	103	75	125				
Iron	5,470	100	5,000	370.2	102	75	125				

Work Order: 1812315
CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

QC SUMMARY REPORT

Dissolved Metals by EPA Method 6020

Sample ID **1812315-001BMS** SampType: **MS** Units: **µg/L** Prep Date: **12/27/2018** RunNo: **48644**
Client ID: **SWU-1** Batch ID: **23094** Analysis Date: **12/28/2018** SeqNo: **953765**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	264	1.00	250.0	0.3610	105	75	125				
Zinc	564	3.50	500.0	0	113	75	125				

Sample ID **1812315-001BMSD** SampType: **MSD** Units: **µg/L** Prep Date: **12/27/2018** RunNo: **48644**
Client ID: **SWU-1** Batch ID: **23094** Analysis Date: **12/28/2018** SeqNo: **953766**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	524	0.500	500.0	1.459	105	75	125	516.4	1.51	20	
Iron	5,660	100	5,000	370.2	106	75	125	5,473	3.29	20	
Lead	258	1.00	250.0	0.3610	103	75	125	263.9	2.06	20	
Zinc	543	3.50	500.0	0	109	75	125	564.1	3.79	20	

Sample ID **MB1-23023FB** SampType: **MBLK** Units: **µg/L** Prep Date: **12/27/2018** RunNo: **48644**
Client ID: **MBLKW** Batch ID: **23094** Analysis Date: **12/28/2018** SeqNo: **953768**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	0.500									
Iron	ND	100									
Lead	ND	1.00									
Zinc	ND	3.50									

NOTES:
Filter Blank

Sample ID **MB2-23023FB** SampType: **MBLK** Units: **µg/L** Prep Date: **12/27/2018** RunNo: **48644**
Client ID: **MBLKW** Batch ID: **23094** Analysis Date: **12/28/2018** SeqNo: **953771**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	0.500									
Iron	ND	100									
Lead	ND	1.00									

Work Order: 1812315
CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

QC SUMMARY REPORT

Dissolved Metals by EPA Method 6020

Sample ID	**MB2-23023FB**	SampType:	**MBLK**		Units:	**µg/L**	Prep Date:	**12/27/2018**	RunNo:	**48644**	
Client ID:	**MBLKW**	Batch ID:	**23094**				Analysis Date:	**12/28/2018**	SeqNo:	**953771**	

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zinc	ND	3.50									

NOTES:
Filter Blank

Work Order: 1812315
CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

QC SUMMARY REPORT

Total Metals by EPA Method 6020

Sample ID	**MB-23086**	SampType:	**MBLK**			Units:	**µg/L**	Prep Date:	**12/27/2018**	RunNo:	**48647**
Client ID:	**MBLKW**	Batch ID:	**23086**					Analysis Date:	**12/28/2018**	SeqNo:	**953886**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	ND	100									

Sample ID	**LCS-23086**	SampType:	**LCS**			Units:	**µg/L**	Prep Date:	**12/27/2018**	RunNo:	**48647**
Client ID:	**LCSW**	Batch ID:	**23086**					Analysis Date:	**12/28/2018**	SeqNo:	**953887**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	853	100	800.0	0	107	80	120				

Sample ID	**1812315-001ADUP**	SampType:	**DUP**			Units:	**µg/L**	Prep Date:	**12/27/2018**	RunNo:	**48647**
Client ID:	**SWU-1**	Batch ID:	**23086**					Analysis Date:	**12/28/2018**	SeqNo:	**953889**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	837	100						690.4	19.2	20	

Sample ID	**1812315-001AMS**	SampType:	**MS**			Units:	**µg/L**	Prep Date:	**12/27/2018**	RunNo:	**48647**
Client ID:	**SWU-1**	Batch ID:	**23086**					Analysis Date:	**12/28/2018**	SeqNo:	**953891**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	4,610	100	4,000	690.4	97.9	75	125				

Sample ID	**1812315-001AMSD**	SampType:	**MSD**			Units:	**µg/L**	Prep Date:	**12/27/2018**	RunNo:	**48647**
Client ID:	**SWU-1**	Batch ID:	**23086**					Analysis Date:	**12/28/2018**	SeqNo:	**953894**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	4,830	100	4,000	690.4	103	75	125	4,606	4.74	20	

Sample Log-In Check List

Client Name:	**COBI**	Work Order Number:	**1812315**
Logged by:	**Brianna Barnes**	Date Received:	**12/20/2018 12:50:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Courier		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C*	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☑	No ☐	NA ☐
			HNO3 added to fraction B.	
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes ☑ No ☐ NA ☐

Person Notified:	Aaron Claiborne	Date	12/20/2018
By Whom:	Brianna Barnes	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Confirmation of analysis.		
Client Instructions:	See COC revision.		

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler	5.9
Sample	6.0
Temp Blank	5.2

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: Page: 1 of: 1

Laboratory Project No (internal): 1812315

Project Name: Vincent Road storm water

Special Remarks:

Client: City of Bainbridge Island

Project No:

Address: 7305 Hidden Cove Rd NE

Collected by: RAY NAVARETTE

City, State, Zip: Bainbridge Island WA 98110

Location: Vincent Road Landfill

Telephone: 206-780-3585

Report To (PM): Aaron Claiborne

Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Fax: 206-780-5104

PM Email: aclaiborne@bainbridgewa.gov

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8) Total (T) | Dissolved (D)	Anions (IC)***	EDB (8011)	Alkalinity	Total Coliform			Comments
1	SWU-1	12/20/18	9:50	SW										1							
2	SWU-1			SW												1					
3	SWU-1			SW													2				
4	SWD-1		10:15	SW										1							
5	SWD-1			SW												1					
6	SWD-1			SW													2				
7																					
8																					
9																					
10																					

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x	12-20-18 12:09	x	12/20/18 1209
x	12/20/18 1221	x	12/20/18 1250

Turn-around Time:

- ☐ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: Page: 1 of: 1

Laboratory Project No (internal): 190235

Project Name: Vincent Road storm water

Special Remarks: Metals: Total Fe, Dissolved Cu, Fe, Zn, Pb.

Client: City of Bainbridge Island

Project No:

Address: 7305 Hidden Cove Rd NE

Collected by: RAY NAVARETTE

City, State, Zip: Bainbridge Island WA 98110

Location: Vincent Road Landfill

Telephone: 206-780-3585

Report To (PM): Aaron Claiborne

edits per AC 12/21/18 RNN

Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Fax: 206-780-5104

PM Email: aclaiborne@bainbridgewa.gov

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T) | Dissolved (D)	Anions (IC)***	EDB (8011)	Alkalinity	Total Coliform	Fecal Coliform	Comments
1	SWU-1	12/20/18	9:50	SW									X	1			X	X	X		
2	SWU-1			SW													1				
3	SWU-1			SW														2			
4	SWD-1		10:15	SW									X	1			X	X	X		
5	SWD-1			SW													1				
6	SWD-1			SW														2			
7																					
8																					
9																					
10																					

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x	12-20-18 1209	x	12/20/18 1209
x	12/20/18 1220	x	12/20/18 1250

Turn-around Time:

- ☐ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Landfill Groundwater
Work Order Number: 1906324

July 02, 2019

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 7 sample(s) on 6/25/2019 for the analyses presented in the following report.

Dissolved Metals by EPA Method 200.8
Ion Chromatography by EPA Method 300.0
Total Metals by EPA Method 200.8
Volatile Organic Compounds by EPA Method 8260D SIM

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *07/02/2019*

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Work Order: 1906324

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1906324-001	BMW-12	06/25/2019 6:25 AM	06/25/2019 1:09 PM
1906324-002	BMW-13	06/25/2019 7:25 AM	06/25/2019 1:09 PM
1906324-003	BMW-14	06/25/2019 8:15 AM	06/25/2019 1:09 PM
1906324-004	BMW-114	06/25/2019 8:15 AM	06/25/2019 1:09 PM
1906324-005	BMW-15	06/25/2019 9:05 AM	06/25/2019 1:09 PM
1906324-006	BOW-37	06/25/2019 9:45 AM	06/25/2019 1:09 PM
1906324-007	Trip Blank	05/23/2019 8:26 AM	06/25/2019 1:09 PM

Case Narrative

WO#: **1906324**
Date: **7/2/2019**

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **1906324**
Date Reported: **7/2/2019**

Client: City of Bainbridge Island
Collection Date: 6/25/2019 6:25:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 1906324-001
Matrix: Groundwater
Client Sample ID: **BMW-12**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 25053		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	6/28/2019 4:26:43 AM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/28/2019 4:26:43 AM
Surr: Dibromofluoromethane	99.6	68 - 140		%Rec	1	6/28/2019 4:26:43 AM
Surr: Toluene-d8	97.3	63.5 - 144		%Rec	1	6/28/2019 4:26:43 AM
Surr: 4-Bromofluorobenzene	97.3	55 - 134		%Rec	1	6/28/2019 4:26:43 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 25052		Analyst: SS
Nitrate (as N)+Nitrite (as N)	1.75	0.100		mg/L	1	6/26/2019 1:20:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 25069		Analyst: CO
Manganese	ND	2.00		µg/L	1	6/28/2019 4:57:00 PM
Total Metals by EPA Method 200.8				Batch ID: 25048		Analyst: CO
Manganese	ND	2.00		µg/L	1	6/27/2019 12:01:21 PM

Analytical Report

Work Order: **1906324**
Date Reported: **7/2/2019**

Client: City of Bainbridge Island
Collection Date: 6/25/2019 7:25:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 1906324-002
Matrix: Groundwater
Client Sample ID: **BMW-13**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 25053		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	6/28/2019 5:37:01 AM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/28/2019 5:37:01 AM
Surr: Dibromofluoromethane	100	68 - 140		%Rec	1	6/28/2019 5:37:01 AM
Surr: Toluene-d8	98.7	63.5 - 144		%Rec	1	6/28/2019 5:37:01 AM
Surr: 4-Bromofluorobenzene	101	55 - 134		%Rec	1	6/28/2019 5:37:01 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 25052		Analyst: SS
Nitrate (as N)+Nitrite (as N)	0.925	0.100		mg/L	1	6/26/2019 2:53:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 25069		Analyst: CO
Manganese	1,300	2.00		µg/L	1	6/28/2019 5:30:21 PM
Total Metals by EPA Method 200.8				Batch ID: 25048		Analyst: CO
Manganese	1,310	2.00		µg/L	1	6/27/2019 12:06:53 PM

Analytical Report

Work Order: **1906324**
Date Reported: **7/2/2019**

Client: City of Bainbridge Island
Collection Date: 6/25/2019 8:15:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 1906324-003
Matrix: Groundwater
Client Sample ID: **BMW-14**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 25053		Analyst: CR
Vinyl chloride	0.263	0.0100		µg/L	1	6/28/2019 6:12:14 AM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/28/2019 6:12:14 AM
Surr: Dibromofluoromethane	100	68 - 140		%Rec	1	6/28/2019 6:12:14 AM
Surr: Toluene-d8	102	63.5 - 144		%Rec	1	6/28/2019 6:12:14 AM
Surr: 4-Bromofluorobenzene	86.8	55 - 134		%Rec	1	6/28/2019 6:12:14 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 25052		Analyst: SS
Nitrate (as N)+Nitrite (as N)	ND	0.100		mg/L	1	6/26/2019 3:16:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 25069		Analyst: CO
Manganese	34.6	2.00		µg/L	1	6/28/2019 5:35:54 PM
Total Metals by EPA Method 200.8				Batch ID: 25048		Analyst: CO
Manganese	38.3	2.00		µg/L	1	6/27/2019 12:12:24 PM

Analytical Report

Work Order: **1906324**
Date Reported: **7/2/2019**

Client: City of Bainbridge Island
Collection Date: 6/25/2019 8:15:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 1906324-004
Matrix: Groundwater
Client Sample ID: **BMW-114**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 25053		Analyst: CR
Vinyl chloride	0.256	0.0100		µg/L	1	6/28/2019 6:47:26 AM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/28/2019 6:47:26 AM
Surr: Dibromofluoromethane	98.8	68 - 140		%Rec	1	6/28/2019 6:47:26 AM
Surr: Toluene-d8	99.8	63.5 - 144		%Rec	1	6/28/2019 6:47:26 AM
Surr: 4-Bromofluorobenzene	101	55 - 134		%Rec	1	6/28/2019 6:47:26 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 25052		Analyst: SS
Nitrate (as N)+Nitrite (as N)	ND	0.100		mg/L	1	6/26/2019 3:39:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 25069		Analyst: CO
Manganese	35.2	2.00		µg/L	1	6/28/2019 5:41:27 PM
Total Metals by EPA Method 200.8				Batch ID: 25048		Analyst: CO
Manganese	38.5	2.00		µg/L	1	6/27/2019 12:17:56 PM

Analytical Report

Work Order: **1906324**
Date Reported: **7/2/2019**

Client: City of Bainbridge Island
Collection Date: 6/25/2019 9:05:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 1906324-005
Matrix: Groundwater
Client Sample ID: **BMW-15**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 25053		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	6/28/2019 7:22:50 AM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/28/2019 7:22:50 AM
Surr: Dibromofluoromethane	100	68 - 140		%Rec	1	6/28/2019 7:22:50 AM
Surr: Toluene-d8	98.4	63.5 - 144		%Rec	1	6/28/2019 7:22:50 AM
Surr: 4-Bromofluorobenzene	84.0	55 - 134		%Rec	1	6/28/2019 7:22:50 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 25052		Analyst: SS
Nitrate (as N)+Nitrite (as N)	1.03	0.100		mg/L	1	6/26/2019 4:02:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 25069		Analyst: CO
Manganese	ND	2.00		µg/L	1	6/28/2019 5:47:00 PM
Total Metals by EPA Method 200.8				Batch ID: 25048		Analyst: CO
Manganese	2.01	2.00		µg/L	1	6/27/2019 12:23:27 PM

Analytical Report

Work Order: **1906324**
Date Reported: **7/2/2019**

Client: City of Bainbridge Island
Collection Date: 6/25/2019 9:45:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 1906324-006
Matrix: Groundwater
Client Sample ID: **BOW-37**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 25053		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	6/28/2019 7:57:58 AM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/28/2019 7:57:58 AM
Surr: Dibromofluoromethane	101	68 - 140		%Rec	1	6/28/2019 7:57:58 AM
Surr: Toluene-d8	98.4	63.5 - 144		%Rec	1	6/28/2019 7:57:58 AM
Surr: 4-Bromofluorobenzene	82.0	55 - 134		%Rec	1	6/28/2019 7:57:58 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 25052		Analyst: SS
Nitrate (as N)+Nitrite (as N)	1.38	0.100		mg/L	1	6/26/2019 4:25:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 25069		Analyst: CO
Manganese	ND	2.00		µg/L	1	6/28/2019 5:52:33 PM
Total Metals by EPA Method 200.8				Batch ID: 25048		Analyst: CO
Manganese	4.63	2.00		µg/L	1	6/27/2019 12:28:59 PM

Work Order: 1906324
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **MB-25052**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **6/26/2019**			RunNo: **52347**	
Client ID: **MBLKW**	Batch ID: **25052**					Analysis Date: **6/26/2019**			SeqNo: **1033708**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	ND	0.100									

Sample ID: **LCS-25052**	SampType: **LCS**			Units: **mg/L**		Prep Date: **6/26/2019**			RunNo: **52347**	
Client ID: **LCSW**	Batch ID: **25052**					Analysis Date: **6/26/2019**			SeqNo: **1033709**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	1.46	0.100	1.500	0	97.1	90	110				

Sample ID: **1906324-001DDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **6/26/2019**			RunNo: **52347**	
Client ID: **BMW-12**	Batch ID: **25052**					Analysis Date: **6/26/2019**			SeqNo: **1033711**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	1.75	0.100						1.750	0.0572	20	

Sample ID: **1906324-001DMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **6/26/2019**			RunNo: **52347**	
Client ID: **BMW-12**	Batch ID: **25052**					Analysis Date: **6/26/2019**			SeqNo: **1033712**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	3.20	0.100	1.500	1.750	96.9	80	120				

Sample ID: **1906324-001DMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **6/26/2019**			RunNo: **52347**	
Client ID: **BMW-12**	Batch ID: **25052**					Analysis Date: **6/26/2019**			SeqNo: **1033713**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	3.27	0.100	1.500	1.750	101	80	120	3.204	2.01	20	

Work Order: 1906324
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-25069**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **6/28/2019**			RunNo: **52417**	
Client ID: **MBLKW**	Batch ID: **25069**					Analysis Date: **6/28/2019**			SeqNo: **1035137**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	2.00									

Sample ID: **LCS-25069**	SampType: **LCS**			Units: **µg/L**		Prep Date: **6/28/2019**			RunNo: **52417**	
Client ID: **LCSW**	Batch ID: **25069**					Analysis Date: **6/28/2019**			SeqNo: **1035138**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	107	2.00	100.0	0	107	85	115				

Sample ID: **1906324-001CDUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **6/28/2019**			RunNo: **52417**	
Client ID: **BMW-12**	Batch ID: **25069**					Analysis Date: **6/28/2019**			SeqNo: **1035140**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	2.00						0		30	

Sample ID: **1906324-001CMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **6/28/2019**			RunNo: **52417**	
Client ID: **BMW-12**	Batch ID: **25069**					Analysis Date: **6/28/2019**			SeqNo: **1035141**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	512	2.00	500.0	0.4010	102	70	130				

Sample ID: **1906324-001CMSD**	SampType: **MSD**			Units: **µg/L**		Prep Date: **6/28/2019**			RunNo: **52417**	
Client ID: **BMW-12**	Batch ID: **25069**					Analysis Date: **6/28/2019**			SeqNo: **1035144**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	528	2.00	500.0	0.4010	106	70	130	512.0	3.10	30	

Work Order: 1906324
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-25060FB** SampType: **MBLK** Units: **µg/L** Prep Date: **6/28/2019** RunNo: **52417**
Client ID: **MBLKW** Batch ID: **25069** Analysis Date: **6/28/2019** SeqNo: **1035150**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	2.00									

Work Order: 1906324
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **MB-25048**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **6/27/2019**			RunNo: **52349**	
Client ID: **MBLKW**	Batch ID: **25048**					Analysis Date: **6/27/2019**			SeqNo: **1033778**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	2.00									

Sample ID: **LCS-25048**	SampType: **LCS**			Units: **µg/L**		Prep Date: **6/27/2019**			RunNo: **52349**	
Client ID: **LCSW**	Batch ID: **25048**					Analysis Date: **6/27/2019**			SeqNo: **1033779**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	109	2.00	100.0	0	109	85	115				

Sample ID: **1906338-001CDUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **6/27/2019**			RunNo: **52349**	
Client ID: **BATCH**	Batch ID: **25048**					Analysis Date: **6/27/2019**			SeqNo: **1033781**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	222	2.00						211.9	4.83	30	

Sample ID: **1906338-001CMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **6/27/2019**			RunNo: **52349**	
Client ID: **BATCH**	Batch ID: **25048**					Analysis Date: **6/27/2019**			SeqNo: **1033782**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	781	2.00	500.0	211.9	114	70	130				

Sample ID: **1906338-001CMSD**	SampType: **MSD**			Units: **µg/L**		Prep Date: **6/27/2019**			RunNo: **52349**	
Client ID: **BATCH**	Batch ID: **25048**					Analysis Date: **6/27/2019**			SeqNo: **1033783**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	802	2.00	500.0	211.9	118	70	130	781.3	2.59	30	

Work Order: 1906324
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D SIM

Sample ID: **LCS-25053** SampType: **LCS** Units: **µg/L** Prep Date: **6/27/2019** RunNo: **52400**
Client ID: **LCSW** Batch ID: **25053** Analysis Date: **6/27/2019** SeqNo: **1035634**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	5.62	0.0100	5.000	0	112	56.3	134				
1,1-Dichloroethene	6.08	0.0100	5.000	0	122	51.5	142				
Surr: Dibromofluoromethane	10.2		10.00		102	68	140				
Surr: Toluene-d8	10.1		10.00		101	63.5	144				
Surr: 4-Bromofluorobenzene	10.2		10.00		102	55	134				

Sample ID: **LCSD-25053** SampType: **LCSD** Units: **µg/L** Prep Date: **6/27/2019** RunNo: **52400**
Client ID: **LCSW02** Batch ID: **25053** Analysis Date: **6/27/2019** SeqNo: **1035635**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	4.79	0.0100	5.000	0	95.9	56.3	134	5.624	15.9	20	
1,1-Dichloroethene	5.13	0.0100	5.000	0	103	51.5	142	6.081	17.0	20	
Surr: Dibromofluoromethane	10.2		10.00		102	68	140		0		
Surr: Toluene-d8	10.1		10.00		101	63.5	144		0		
Surr: 4-Bromofluorobenzene	9.28		10.00		92.8	55	134		0		

Sample ID: **MB-25053** SampType: **MBLK** Units: **µg/L** Prep Date: **6/27/2019** RunNo: **52400**
Client ID: **MBLKW** Batch ID: **25053** Analysis Date: **6/27/2019** SeqNo: **1035636**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100									
1,1-Dichloroethene	ND	0.0100									
Surr: Dibromofluoromethane	9.84		10.00		98.4	68	140				
Surr: Toluene-d8	9.45		10.00		94.5	63.5	144				
Surr: 4-Bromofluorobenzene	9.87		10.00		98.7	55	134				

Work Order: 1906324
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D SIM

Sample ID: **1906324-001ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **6/27/2019** RunNo: **52400**
Client ID: **BMW-12** Batch ID: **25053** Analysis Date: **6/28/2019** SeqNo: **1035624**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100						0		30	
1,1-Dichloroethene	ND	0.0100						0		30	
Surr: Dibromofluoromethane	9.97		10.00		99.7	68	140		0		
Surr: Toluene-d8	9.76		10.00		97.6	63.5	144		0		
Surr: 4-Bromofluorobenzene	9.81		10.00		98.1	55	134		0		

Sample ID: **1906324-006ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **6/27/2019** RunNo: **52400**
Client ID: **BOW-37** Batch ID: **25053** Analysis Date: **6/28/2019** SeqNo: **1035630**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100						0		30	
1,1-Dichloroethene	ND	0.0100						0		30	
Surr: Dibromofluoromethane	10.1		10.00		101	68	140		0		
Surr: Toluene-d8	9.89		10.00		98.9	63.5	144		0		
Surr: 4-Bromofluorobenzene	8.02		10.00		80.2	55	134		0		

Sample Log-In Check List

Client Name:	**COBI**	Work Order Number:	**1906324**
Logged by:	**Clare Griggs**	Date Received:	**6/25/2019 1:09:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Courier		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☑	No ☐	NA ☐ HNO3
12.	Is there headspace in the VOA vials?	Yes ☐	No ☑	NA ☐
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☑	No ☐	NA ☐

Person Notified:		Date:	6/26/2019
By Whom:	Clare Griggs	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Confirming 8260 vs 8260 SIM.		
Client Instructions:			

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler	2.1
Sample	8.6
Temp Blank	7.4

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: | Page: | of:

Laboratory Project No (internal): 1906324

Project Name: Vincent Landfill Groundwater

Special Remarks: VOCs; 1,1-DCE, VC only.

Project No: 22602

Client: City of Bainbridge Island

Collected by: Ray Navarette

Address: 7305 Hidden Cove Rd NE

Location: Vincent Land Fill

City, State, Zip: Bainbridge Island WA 98110

Report To (PM): Aaron Claiborne

Telephone: (206) 842-1212

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Fax: (206) 780-5104

PM Email: aclaiborne@bainbridgewa.gov

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T)	Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1	BMW-12	6-25	6:25	GW	X									X			X		
2	BMW-13	6-25	7:25	GW	X									X			X		
3	BMW-14	6-25	8:15	GW	X									X			X		
4	BMW-114	6-25	8:15	GW	X									X			X		
5	BMW-15	6-25	9:05	GW	X									X			X		
6	BOW-37	6-25	9:45	GW	X									X			X		
7																			
8																			
9																			
10																			

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:

- ☒ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x	6-25-19 12:15	x	6-25-19 12:15
x	6/25/19 13:09	x	6/25/19 1309

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Road Landfill
Work Order Number: 1912276

December 24, 2019

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 7 sample(s) on 12/17/2019 for the analyses presented in the following report.

Dissolved Metals by EPA Method 200.8
Ion Chromatography by EPA Method 300.0
Total Metals by EPA Method 200.8
Volatile Organic Compounds by EPA Method 8260D SIM

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *12/24/2019*

CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill
Work Order: 1912276

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1912276-001	BMW-12	12/17/2019 6:45 AM	12/17/2019 12:45 PM
1912276-002	BMW-13	12/17/2019 7:40 AM	12/17/2019 12:45 PM
1912276-003	BMW-14	12/17/2019 8:30 AM	12/17/2019 12:45 PM
1912276-004	BMW-114 (Dup)	12/17/2019 8:30 AM	12/17/2019 12:45 PM
1912276-005	BMW-15	12/17/2019 9:15 AM	12/17/2019 12:45 PM
1912276-006	BMW-37	12/17/2019 10:00 AM	12/17/2019 12:45 PM
1912276-007	Trip Blank	12/11/2019 10:59 AM	12/17/2019 12:45 PM

Case Narrative

WO#: **1912276**

Date: **12/24/2019**

CLIENT: City of Bainbridge Island

Project: Vincent Road Landfill

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Analytical Report

Work Order: **1912276**
Date Reported: **12/24/2019**

Client: City of Bainbridge Island
Collection Date: 12/17/2019 6:45:00 AM
Project: Vincent Road Landfill
Lab ID: 1912276-001
Matrix: Groundwater
Client Sample ID: **BMW-12**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 26860		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	12/23/2019 11:51:43 AM
1,1-DCE	ND	0.0100		µg/L	1	12/23/2019 11:51:43 AM
Surr: Dibromofluoromethane	101	68 - 140		%Rec	1	12/23/2019 11:51:43 AM
Surr: Toluene-d8	101	63.5 - 144		%Rec	1	12/23/2019 11:51:43 AM
Surr: 4-Bromofluorobenzene	97.8	55 - 134		%Rec	1	12/23/2019 11:51:43 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 26875		Analyst: SS
Nitrate (as N)+Nitrite (as N)	2.15	0.100		mg/L	1	12/18/2019 11:15:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 26899		Analyst: CO
Manganese	ND	2.00		µg/L	1	12/20/2019 7:57:36 PM
Total Metals by EPA Method 200.8				Batch ID: 26878		Analyst: CO
Manganese	ND	5.00		µg/L	1	12/19/2019 1:38:06 PM

Analytical Report

Work Order: **1912276**
Date Reported: **12/24/2019**

Client: City of Bainbridge Island
Collection Date: 12/17/2019 7:40:00 AM
Project: Vincent Road Landfill
Lab ID: 1912276-002
Matrix: Groundwater
Client Sample ID: **BMW-13**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 26860		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	12/23/2019 12:26:39 PM
1,1-DCE	ND	0.0100		µg/L	1	12/23/2019 12:26:39 PM
Surr: Dibromofluoromethane	100	68 - 140		%Rec	1	12/23/2019 12:26:39 PM
Surr: Toluene-d8	100	63.5 - 144		%Rec	1	12/23/2019 12:26:39 PM
Surr: 4-Bromofluorobenzene	94.5	55 - 134		%Rec	1	12/23/2019 12:26:39 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 26875		Analyst: SS
Nitrate (as N)+Nitrite (as N)	1.68	0.100		mg/L	1	12/18/2019 11:38:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 26899		Analyst: CO
Manganese	1,280	2.00		µg/L	1	12/20/2019 8:19:57 PM
Total Metals by EPA Method 200.8				Batch ID: 26878		Analyst: CO
Manganese	1,420	5.00		µg/L	1	12/19/2019 2:15:00 PM

Analytical Report

Work Order: **1912276**
Date Reported: **12/24/2019**

Client: City of Bainbridge Island
Collection Date: 12/17/2019 8:30:00 AM
Project: Vincent Road Landfill
Lab ID: 1912276-003
Matrix: Groundwater
Client Sample ID: **BMW-14**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 26860		Analyst: CR
Vinyl chloride	0.228	0.0100		µg/L	1	12/23/2019 1:01:32 PM
1,1-DCE	ND	0.0100		µg/L	1	12/23/2019 1:01:32 PM
Surr: Dibromofluoromethane	101	68 - 140		%Rec	1	12/23/2019 1:01:32 PM
Surr: Toluene-d8	97.4	63.5 - 144		%Rec	1	12/23/2019 1:01:32 PM
Surr: 4-Bromofluorobenzene	95.4	55 - 134		%Rec	1	12/23/2019 1:01:32 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 26857		Analyst: SS
Nitrate (as N)+Nitrite (as N)	0.203	0.100		mg/L	1	12/18/2019 4:38:00 AM
Dissolved Metals by EPA Method 200.8				Batch ID: 26899		Analyst: CO
Manganese	53.1	2.00		µg/L	1	12/20/2019 8:25:31 PM
Total Metals by EPA Method 200.8				Batch ID: 26878		Analyst: CO
Manganese	56.6	5.00		µg/L	1	12/19/2019 2:20:37 PM

Analytical Report

Work Order: **1912276**
Date Reported: **12/24/2019**

Client: City of Bainbridge Island
Collection Date: 12/17/2019 8:30:00 AM
Project: Vincent Road Landfill
Lab ID: 1912276-004
Matrix: Groundwater
Client Sample ID: **BMW-114 (Dup)**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 26860		Analyst: CR
Vinyl chloride	0.231	0.0100		µg/L	1	12/23/2019 1:36:24 PM
1,1-DCE	0.0261	0.0100		µg/L	1	12/23/2019 1:36:24 PM
Surr: Dibromofluoromethane	102	68 - 140		%Rec	1	12/23/2019 1:36:24 PM
Surr: Toluene-d8	98.7	63.5 - 144		%Rec	1	12/23/2019 1:36:24 PM
Surr: 4-Bromofluorobenzene	96.6	55 - 134		%Rec	1	12/23/2019 1:36:24 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 26857		Analyst: SS
Nitrate (as N)+Nitrite (as N)	0.359	0.100		mg/L	1	12/18/2019 5:01:00 AM
Dissolved Metals by EPA Method 200.8				Batch ID: 26899		Analyst: CO
Manganese	51.4	2.00		µg/L	1	12/20/2019 8:42:15 PM
Total Metals by EPA Method 200.8				Batch ID: 26878		Analyst: CO
Manganese	58.7	5.00		µg/L	1	12/19/2019 2:38:38 PM

Analytical Report

Work Order: **1912276**
Date Reported: **12/24/2019**

Client: City of Bainbridge Island
Collection Date: 12/17/2019 9:15:00 AM
Project: Vincent Road Landfill
Lab ID: 1912276-005
Matrix: Groundwater
Client Sample ID: **BMW-15**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 26860		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	12/23/2019 2:11:22 PM
1,1-DCE	ND	0.0100		µg/L	1	12/23/2019 2:11:22 PM
Surr: Dibromofluoromethane	100	68 - 140		%Rec	1	12/23/2019 2:11:22 PM
Surr: Toluene-d8	102	63.5 - 144		%Rec	1	12/23/2019 2:11:22 PM
Surr: 4-Bromofluorobenzene	97.3	55 - 134		%Rec	1	12/23/2019 2:11:22 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 26857		Analyst: SS
Nitrate (as N)+Nitrite (as N)	1.44	0.200	D	mg/L	2	12/18/2019 5:25:00 AM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 200.8				Batch ID: 26899		Analyst: CO
Manganese	ND	2.00		µg/L	1	12/20/2019 8:47:50 PM
Total Metals by EPA Method 200.8				Batch ID: 26878		Analyst: CO
Manganese	ND	5.00		µg/L	1	12/19/2019 2:44:14 PM

Analytical Report

Work Order: **1912276**
Date Reported: **12/24/2019**

Client: City of Bainbridge Island
Collection Date: 12/17/2019 10:00:00 AM
Project: Vincent Road Landfill
Lab ID: 1912276-006
Matrix: Groundwater
Client Sample ID: **BMW-37**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 26860		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	12/23/2019 2:46:15 PM
1,1-DCE	ND	0.0100		µg/L	1	12/23/2019 2:46:15 PM
Surr: Dibromofluoromethane	102	68 - 140		%Rec	1	12/23/2019 2:46:15 PM
Surr: Toluene-d8	101	63.5 - 144		%Rec	1	12/23/2019 2:46:15 PM
Surr: 4-Bromofluorobenzene	98.5	55 - 134		%Rec	1	12/23/2019 2:46:15 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 26857		Analyst: SS
Nitrate (as N)+Nitrite (as N)	1.22	0.100		mg/L	1	12/18/2019 5:48:00 AM
Dissolved Metals by EPA Method 200.8				Batch ID: 26899		Analyst: CO
Manganese	ND	2.00		µg/L	1	12/20/2019 8:53:24 PM
Total Metals by EPA Method 200.8				Batch ID: 26878		Analyst: CO
Manganese	ND	5.00		µg/L	1	12/19/2019 2:49:51 PM

Work Order: 1912276
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **MB-26857**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **12/17/2019**	RunNo: **56088**
Client ID: **MBLKW**	Batch ID: **26857**		Analysis Date: **12/17/2019**	SeqNo: **1116933**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	ND	0.100									Q

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: **LCS-26857**	SampType: **LCS**	Units: **mg/L**	Prep Date: **12/17/2019**	RunNo: **56088**
Client ID: **LCSW**	Batch ID: **26857**		Analysis Date: **12/17/2019**	SeqNo: **1116934**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	1.38	0.100	1.500	0	92.1	90	110				

Sample ID: **1912228-001BDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **12/17/2019**	RunNo: **56088**
Client ID: **BATCH**	Batch ID: **26857**		Analysis Date: **12/17/2019**	SeqNo: **1116936**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	0.297	0.100						0.3170	6.51	20	Q

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: **1912228-001BMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **12/17/2019**	RunNo: **56088**
Client ID: **BATCH**	Batch ID: **26857**		Analysis Date: **12/17/2019**	SeqNo: **1116937**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	1.55	0.100	1.500	0.3170	82.3	80	120				

Sample ID: **1912228-001BMSD**	SampType: **MSD**	Units: **mg/L**	Prep Date: **12/17/2019**	RunNo: **56088**
Client ID: **BATCH**	Batch ID: **26857**		Analysis Date: **12/17/2019**	SeqNo: **1116938**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	1.72	0.100	1.500	0.3170	93.6	80	120	1.551	10.4	20	

Work Order: 1912276
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **1912246-001BDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/17/2019**		RunNo: **56088**			
Client ID: **BATCH**	Batch ID: **26857**					Analysis Date: **12/18/2019**		SeqNo: **1116946**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	0.384	0.100						0.3450	10.7	20	Q

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: **1912246-001BMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **12/17/2019**		RunNo: **56088**			
Client ID: **BATCH**	Batch ID: **26857**					Analysis Date: **12/18/2019**		SeqNo: **1116947**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	1.77	0.100	1.500	0.3450	94.7	80	120				

Sample ID: **MB-26875**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **12/18/2019**		RunNo: **56118**			
Client ID: **MBLKW**	Batch ID: **26875**					Analysis Date: **12/18/2019**		SeqNo: **1117820**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	ND	0.100									

Sample ID: **LCS-26875**	SampType: **LCS**			Units: **mg/L**		Prep Date: **12/18/2019**		RunNo: **56118**			
Client ID: **LCSW**	Batch ID: **26875**					Analysis Date: **12/18/2019**		SeqNo: **1117821**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	1.38	0.100	1.500	0	92.2	90	110				

Sample ID: **1912263-001BDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/18/2019**		RunNo: **56118**			
Client ID: **BATCH**	Batch ID: **26875**					Analysis Date: **12/18/2019**		SeqNo: **1117831**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	0.248	0.200						0.2500	0.803	20	D

Work Order: 1912276
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **1912263-001BMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **12/18/2019**		RunNo: **56118**			
Client ID: **BATCH**	Batch ID: **26875**					Analysis Date: **12/18/2019**		SeqNo: **1117832**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	3.02	0.200	3.000	0.2500	92.3	80	120				D

Sample ID: **1912263-001BMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **12/18/2019**		RunNo: **56118**			
Client ID: **BATCH**	Batch ID: **26875**					Analysis Date: **12/18/2019**		SeqNo: **1117833**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	3.05	0.200	3.000	0.2500	93.4	80	120	3.018	1.12	20	D

Sample ID: **1912307-001BDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/18/2019**		RunNo: **56118**			
Client ID: **BATCH**	Batch ID: **26875**					Analysis Date: **12/19/2019**		SeqNo: **1117846**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	ND	0.100						0		20	

Sample ID: **1912307-001BMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **12/18/2019**		RunNo: **56118**			
Client ID: **BATCH**	Batch ID: **26875**					Analysis Date: **12/19/2019**		SeqNo: **1117847**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	1.43	0.100	1.500	0	95.5	80	120				

Work Order: 1912276
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-26899**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/20/2019**		RunNo: **56184**		
Client ID: **MBLKW**	Batch ID: **26899**					Analysis Date: **12/20/2019**		SeqNo: **1119332**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	2.00									

Sample ID: **LCS-26899**	SampType: **LCS**			Units: **µg/L**		Prep Date: **12/20/2019**		RunNo: **56184**		
Client ID: **LCSW**	Batch ID: **26899**					Analysis Date: **12/20/2019**		SeqNo: **1119333**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	105	2.00	100.0	0	105	85	115				

Sample ID: **1912276-001CDUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **12/20/2019**		RunNo: **56184**		
Client ID: **BMW-12**	Batch ID: **26899**					Analysis Date: **12/20/2019**		SeqNo: **1119335**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	2.00						0		30	

Sample ID: **1912276-001CMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **12/20/2019**		RunNo: **56184**		
Client ID: **BMW-12**	Batch ID: **26899**					Analysis Date: **12/20/2019**		SeqNo: **1119336**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	507	2.00	500.0	0	101	70	130				

Sample ID: **1912276-001CMSD**	SampType: **MSD**			Units: **µg/L**		Prep Date: **12/20/2019**		RunNo: **56184**		
Client ID: **BMW-12**	Batch ID: **26899**					Analysis Date: **12/20/2019**		SeqNo: **1119337**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	509	2.00	500.0	0	102	70	130	507.0	0.331	30	

Work Order: 1912276
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **MB-26878**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/19/2019**		RunNo: **56135**		
Client ID: **MBLKW**	Batch ID: **26878**					Analysis Date: **12/19/2019**		SeqNo: **1118252**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	5.00									

Sample ID: **LCS-26878**	SampType: **LCS**			Units: **µg/L**		Prep Date: **12/19/2019**		RunNo: **56135**		
Client ID: **LCSW**	Batch ID: **26878**					Analysis Date: **12/19/2019**		SeqNo: **1118253**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	97.6	5.00	100.0	0	97.6	85	115				

Sample ID: **1912276-001BDUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **12/19/2019**		RunNo: **56135**		
Client ID: **BMW-12**	Batch ID: **26878**					Analysis Date: **12/19/2019**		SeqNo: **1118255**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	5.00						0		30	

Sample ID: **1912276-001BMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **12/19/2019**		RunNo: **56135**		
Client ID: **BMW-12**	Batch ID: **26878**					Analysis Date: **12/19/2019**		SeqNo: **1118256**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	563	5.00	500.0	0.5035	112	70	130				

Sample ID: **1912276-001BMSD**	SampType: **MSD**			Units: **µg/L**		Prep Date: **12/19/2019**		RunNo: **56135**		
Client ID: **BMW-12**	Batch ID: **26878**					Analysis Date: **12/19/2019**		SeqNo: **1118257**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	584	5.00	500.0	0.5035	117	70	130	562.5	3.81	30	

Work Order: 1912276
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D SIM

Sample ID: **LCS-26860** SampType: **LCS** Units: **µg/L** Prep Date: **12/17/2019** RunNo: **56205**
Client ID: **LCSW** Batch ID: **26860** Analysis Date: **12/23/2019** SeqNo: **1119825**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	5.16	0.0100	5.000	0	103	56.3	134				
1,1-DCE	5.00	0.0100	5.000	0	100	51.5	142				
Surr: Dibromofluoromethane	10.3		10.00		103	68	140				
Surr: Toluene-d8	9.92		10.00		99.2	63.5	144				
Surr: 4-Bromofluorobenzene	10.3		10.00		103	55	134				

Sample ID: **MB-26860** SampType: **MBLK** Units: **µg/L** Prep Date: **12/17/2019** RunNo: **56205**
Client ID: **MBLKW** Batch ID: **26860** Analysis Date: **12/23/2019** SeqNo: **1119826**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100									
1,1-DCE	ND	0.0100									
Surr: Dibromofluoromethane	10.1		10.00		101	68	140				
Surr: Toluene-d8	10.2		10.00		102	63.5	144				
Surr: 4-Bromofluorobenzene	9.80		10.00		98.0	55	134				

Sample ID: **1912276-006ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/17/2019** RunNo: **56205**
Client ID: **BMW-37** Batch ID: **26860** Analysis Date: **12/23/2019** SeqNo: **1119821**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100						0		30	
1,1-DCE	ND	0.0100						0		30	
Surr: Dibromofluoromethane	10.3		10.00		103	68	140		0		
Surr: Toluene-d8	10.2		10.00		102	63.5	144		0		
Surr: 4-Bromofluorobenzene	10.0		10.00		100	55	134		0		

Work Order: 1912276
CLIENT: City of Bainbridge Island
Project: Vincent Road Landfill

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D SIM

Sample ID: **1912276-005AMS** SampType: **MS** Units: **µg/L** Prep Date: **12/17/2019** RunNo: **56205**
Client ID: **BMW-15** Batch ID: **26860** Analysis Date: **12/23/2019** SeqNo: **1119818**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	5.66	0.0100	5.000	0	113	40.8	154				
1,1-DCE	5.11	0.0100	5.000	0	102	37.5	171				
Surr: Dibromofluoromethane	10.2		10.00		102	77.9	124				
Surr: Toluene-d8	9.79		10.00		97.9	63.5	144				
Surr: 4-Bromofluorobenzene	9.86		10.00		98.6	77.4	118				

Sample ID: **1912276-005AMSD** SampType: **MSD** Units: **µg/L** Prep Date: **12/17/2019** RunNo: **56205**
Client ID: **BMW-15** Batch ID: **26860** Analysis Date: **12/23/2019** SeqNo: **1119819**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	5.95	0.0100	5.000	0	119	40.8	154	5.657	4.97	30	
1,1-DCE	5.46	0.0100	5.000	0	109	37.5	171	5.107	6.67	30	
Surr: Dibromofluoromethane	10.5		10.00		105	77.9	124		0		
Surr: Toluene-d8	9.95		10.00		99.5	63.5	144		0		
Surr: 4-Bromofluorobenzene	9.77		10.00		97.7	77.4	118		0		

Sample Log-In Check List

Client Name:	**COBI**	Work Order Number:	**1912276**
Logged by:	**Clare Griggs**	Date Received:	**12/17/2019 12:45:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Courier		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☑	NA ☐
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes ☑ No ☐ NA ☐

Person Notified:	Ray Navarette	Date:	12/17/2019
By Whom:	Clare Griggs	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Confirming if samples were field filtered.		
Client Instructions:	Samples were field filtered.		

19. Additional remarks:

Item Information

Item #	Temp °C
Cooler	7.8
Sample	5.3
Temp Blank	8.4

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: | Page: 1 of: 1 | Laboratory Project No (internal): 1912776

Project Name: Vincent Road Landfill

Special Remarks: VOCs: 1,1-DCE, VC only

Client: City of Bainbridge Island

Project No:

Address: 7305 Hidden Cove Rd NE

Collected by: Ray Navarette

City, State, Zip: Bainbridge Is WA 98110

Location: Vincent Road Landfill

Telephone: 206-780-3585

Report To (PM): Aaron Claiborne

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Fax: 206-780-5104

PM Email: aclaiborne@bainbridgewa.gov

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624) SIM	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8) Total (T) / Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1	Bmw-12	12-17-19	6:45	GW	3								2	1			
2	Bmw-13	12-17-19	7:40	GW	3								2	1			
3	Bmw-14	12-17-19	8:30	GW	3								2	1			
4	Bmw-114 (Dup)	12-17-19	8:30	GW	3								2	1			
5	Bmw-15	12-17-19	9:15	GW	5								2	1			
6	Bow-37	12-17-19	10:00	GW	3								2	1			
7																	
8																	
9																	
10																	

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x	12-17-19 12-12-19	x	12/17/19 12:12
x	12/17/19 12:39	x	12/17/19 12:15 min 12/17/19 12:45

Turn-around Time:
- ☒ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Road Storm Water
Work Order Number: 1912300

December 26, 2019

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 3 sample(s) on 12/18/2019 for the analyses presented in the following report.

Dissolved Metals by EPA Method 200.8
Total Metals by EPA Method 200.8
Total Alkalinity by SM 2320B
Total Coliform by EPA Method 1604

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *12/26/2019*

CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water
Work Order: 1912300

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1912300-001	SWU-1	12/18/2019 8:30 AM	12/18/2019 10:48 AM
1912300-002	SWD-1	12/18/2019 9:00 AM	12/18/2019 10:48 AM
1912300-003	SWD-11 (Dup)	12/18/2019 9:00 AM	12/18/2019 10:48 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1912300**

Date: **12/26/2019**

CLIENT: City of Bainbridge Island

Project: Vincent Road Storm Water

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **1912300**
Date Reported: **12/26/2019**

Client: City of Bainbridge Island
Collection Date: 12/18/2019 8:30:00 AM
Project: Vincent Road Storm Water
Lab ID: 1912300-001
Matrix: Stormwater
Client Sample ID: **SWU-1**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Coliform by EPA Method 1604				Batch ID: R56120		Analyst: TN
Coliform, Total	>200	1.00	TNTC	CFU/100ml	1	12/18/2019 11:45:00 AM
E. coli	8.00	1.00		CFU/100ml	1	12/18/2019 11:45:00 AM
NOTES: TNTC - Too numerous to count Confluent growth observed.						
Dissolved Metals by EPA Method 200.8				Batch ID: 26899		Analyst: CO
Iron	665	100		µg/L	1	12/20/2019 9:04:33 PM
Total Metals by EPA Method 200.8				Batch ID: 26897		Analyst: CO
Copper	ND	2.00		µg/L	1	12/20/2019 6:27:51 PM
Iron	667	100		µg/L	1	12/20/2019 6:27:51 PM
Lead	ND	1.00		µg/L	1	12/20/2019 6:27:51 PM
Zinc	6.56	2.50		µg/L	1	12/20/2019 6:27:51 PM
Total Alkalinity by SM 2320B				Batch ID: R56238		Analyst: WF
Alkalinity, Total (As CaCO3)	31.2	2.50		mg/L	1	12/24/2019 10:46:44 AM

Analytical Report

Work Order: **1912300**
Date Reported: **12/26/2019**

Client: City of Bainbridge Island
Collection Date: 12/18/2019 9:00:00 AM
Project: Vincent Road Storm Water
Lab ID: 1912300-002
Matrix: Stormwater
Client Sample ID: **SWD-1**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Coliform by EPA Method 1604				Batch ID: R56120		Analyst: TN
Coliform, Total	>200	1.00	TNTC	CFU/100ml	1	12/18/2019 11:45:00 AM
E. coli	63.0	1.00		CFU/100ml	1	12/18/2019 11:45:00 AM
NOTES: TNTC - Too numerous to count Confluent growth observed.						
Dissolved Metals by EPA Method 200.8				Batch ID: 26899		Analyst: CO
Iron	495	100		µg/L	1	12/20/2019 9:10:07 PM
Total Metals by EPA Method 200.8				Batch ID: 26897		Analyst: CO
Copper	10.1	2.00		µg/L	1	12/20/2019 6:33:28 PM
Iron	708	100		µg/L	1	12/20/2019 6:33:28 PM
Lead	2.16	1.00		µg/L	1	12/20/2019 6:33:28 PM
Zinc	19.4	2.50		µg/L	1	12/20/2019 6:33:28 PM
Total Alkalinity by SM 2320B				Batch ID: R56238		Analyst: WF
Alkalinity, Total (As CaCO3)	27.3	2.50		mg/L	1	12/24/2019 10:46:44 AM

Analytical Report

Work Order: **1912300**
Date Reported: **12/26/2019**

Client: City of Bainbridge Island
Collection Date: 12/18/2019 9:00:00 AM
Project: Vincent Road Storm Water
Lab ID: 1912300-003
Matrix: Stormwater
Client Sample ID: **SWD-11 (Dup)**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Coliform by EPA Method 1604				Batch ID: R56120		Analyst: TN
Coliform, Total	>200	1.00	TNTC	CFU/100ml	1	12/18/2019 11:45:00 AM
E. coli	41.0	1.00		CFU/100ml	1	12/18/2019 11:45:00 AM
NOTES: TNTC - Too numerous to count Confluent growth observed.						
Dissolved Metals by EPA Method 200.8				Batch ID: 26899		Analyst: CO
Iron	428	100		µg/L	1	12/20/2019 9:15:41 PM
Total Metals by EPA Method 200.8				Batch ID: 26897		Analyst: CO
Copper	9.52	2.00		µg/L	1	12/20/2019 6:39:04 PM
Iron	671	100		µg/L	1	12/20/2019 6:39:04 PM
Lead	1.34	1.00		µg/L	1	12/20/2019 6:39:04 PM
Zinc	24.6	2.50		µg/L	1	12/20/2019 6:39:04 PM
Total Alkalinity by SM 2320B				Batch ID: R56238		Analyst: WF
Alkalinity, Total (As CaCO3)	35.1	2.50		mg/L	1	12/24/2019 10:46:44 AM

Work Order: 1912300
CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

QC SUMMARY REPORT

Total Coliform by EPA Method 1604

Sample ID: **MB-R56120** SampType: **MBLK** Units: **CFU/100ml** Prep Date: **12/18/2019** RunNo: **56120**
Client ID: **MBLKW** Batch ID: **R56120** Analysis Date: **12/18/2019** SeqNo: **1117967**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Coliform, Total	ND	1.00									
E. coli	ND	1.00									

Work Order: 1912300
CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: **MB-R56238**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **12/24/2019**			RunNo: **56238**	
Client ID: **MBLKW**	Batch ID: **R56238**					Analysis Date: **12/24/2019**			SeqNo: **1120548**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-R56238**	SampType: **LCS**			Units: **mg/L**		Prep Date: **12/24/2019**			RunNo: **56238**	
Client ID: **LCSW**	Batch ID: **R56238**					Analysis Date: **12/24/2019**			SeqNo: **1120549**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	102	2.50	100.0	0	102	94.3	116				

Sample ID: **1912300-001CDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/24/2019**			RunNo: **56238**	
Client ID: **SWU-1**	Batch ID: **R56238**					Analysis Date: **12/24/2019**			SeqNo: **1120551**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	31.2	2.50						31.20	0	20	

Work Order: 1912300
CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-26899**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/20/2019**		RunNo: **56184**		
Client ID: **MBLKW**	Batch ID: **26899**					Analysis Date: **12/20/2019**		SeqNo: **1119332**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	ND	100									

Sample ID: **LCS-26899**	SampType: **LCS**			Units: **µg/L**		Prep Date: **12/20/2019**		RunNo: **56184**		
Client ID: **LCSW**	Batch ID: **26899**					Analysis Date: **12/20/2019**		SeqNo: **1119333**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	963	100	1,000	0	96.3	50	150				

Sample ID: **1912276-001CDUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **12/20/2019**		RunNo: **56184**		
Client ID: **BATCH**	Batch ID: **26899**					Analysis Date: **12/20/2019**		SeqNo: **1119335**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	ND	100						0		30	

Sample ID: **1912276-001CMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **12/20/2019**		RunNo: **56184**		
Client ID: **BATCH**	Batch ID: **26899**					Analysis Date: **12/20/2019**		SeqNo: **1119336**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	4,680	100	5,000	0	93.5	50	150				

Sample ID: **1912276-001CMSD**	SampType: **MSD**			Units: **µg/L**		Prep Date: **12/20/2019**		RunNo: **56184**		
Client ID: **BATCH**	Batch ID: **26899**					Analysis Date: **12/20/2019**		SeqNo: **1119337**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	5,010	100	5,000	0	100	50	150	4,677	6.87	30	

Work Order: 1912300
CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-26887FB** SampType: **MBLK** Units: **µg/L** Prep Date: **12/20/2019** RunNo: **56184**
Client ID: **MBLKW** Batch ID: **26899** Analysis Date: **12/20/2019** SeqNo: **1119345**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	ND	100									

NOTES:
Filter Blank

Work Order: 1912300
CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **MB-26897** SampType: **MBLK** Units: **µg/L** Prep Date: **12/20/2019** RunNo: **56194**
Client ID: **MBLKW** Batch ID: **26897** Analysis Date: **12/20/2019** SeqNo: **1119611**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	2.00									
Iron	ND	100									
Lead	ND	1.00									
Zinc	ND	2.50									

Sample ID: **LCS-26897** SampType: **LCS** Units: **µg/L** Prep Date: **12/20/2019** RunNo: **56194**
Client ID: **LCSW** Batch ID: **26897** Analysis Date: **12/20/2019** SeqNo: **1119612**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	101	2.00	100.0	0	101	85	115				
Iron	985	100	1,000	0	98.5	50	150				
Lead	48.4	1.00	50.00	0	96.8	85	115				
Zinc	107	2.50	100.0	0	107	85	115				

Sample ID: **1912326-002CDUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/20/2019** RunNo: **56194**
Client ID: **BATCH** Batch ID: **26897** Analysis Date: **12/20/2019** SeqNo: **1119614**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	15.3	2.00						15.23	0.308	30	
Iron	540	100						529.0	2.13	30	
Lead	2.54	1.00						2.496	1.73	30	
Zinc	27.5	2.50						28.17	2.33	30	

Sample ID: **1912326-002CMS** SampType: **MS** Units: **µg/L** Prep Date: **12/20/2019** RunNo: **56194**
Client ID: **BATCH** Batch ID: **26897** Analysis Date: **12/20/2019** SeqNo: **1119615**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	563	2.00	500.0	15.23	110	70	130				
Iron	6,100	100	5,000	529.0	111	50	150				

Work Order: 1912300
CLIENT: City of Bainbridge Island
Project: Vincent Road Storm Water

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **1912326-002CMS** SampType: **MS** Units: **µg/L** Prep Date: **12/20/2019** RunNo: **56194**
Client ID: **BATCH** Batch ID: **26897** Analysis Date: **12/20/2019** SeqNo: **1119615**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	245	1.00	250.0	2.496	97.0	70	130				
Zinc	670	2.50	500.0	28.17	128	70	130				

Sample ID: **1912326-002CMSD** SampType: **MSD** Units: **µg/L** Prep Date: **12/20/2019** RunNo: **56194**
Client ID: **BATCH** Batch ID: **26897** Analysis Date: **12/20/2019** SeqNo: **1119616**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	559	2.00	500.0	15.23	109	70	130	562.9	0.654	30	
Iron	5,930	100	5,000	529.0	108	50	150	6,097	2.71	30	
Lead	241	1.00	250.0	2.496	95.6	70	130	244.9	1.43	30	
Zinc	663	2.50	500.0	28.17	127	70	130	669.8	1.02	30	

Sample Log-In Check List

Client Name:	**COBI**	Work Order Number:	**1912300**
Logged by:	**Carissa True**	Date Received:	**12/18/2019 10:48:00 AM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐	
2.	How was the sample delivered?	Courier			

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐	
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐		
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑	
6.	Was an attempt made to cool the samples?	Yes ☐	No ☑	NA ☐	
	Samples received at appropriate temperature				
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☑	No ☐	NA ☐	
8.	Sample(s) in proper container(s)?	Yes ☐	No ☑		
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐		
10.	Are samples properly preserved?	Yes ☑	No ☐		
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐	
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑	
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐		
14.	Does paperwork match bottle labels?	Yes ☑	No ☐		
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐		
16.	Is it clear what analyses were requested?	Yes ☑	No ☐		
17.	Were all holding times able to be met?	Yes ☑	No ☐		

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☑	No ☐	NA ☐	

Person Notified:	Aaron Claiborne	Date:	12/19/2019
By Whom:	Carissa True	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Diss. metals not FF & in preserved container, using alkalinity volume		
Client Instructions:			

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler 1	9.4
Sample 1	7.4
Temp Blank 1	9.9

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: Page: 1 of: 1

Laboratory Project No (internal): 1912300

Project Name: Vincent Road Storm water

Special Remarks: metals: Total Cu, Fe, Zn, Pb
Dissolved Fe

Client: City of Bainbridge Island

Project No:

Address: 7305 Hidden Cove Rd NE

Collected by: RAY Navarette

City, State, Zip: Bainbridge Island wa 98110

Location: Vincent Road Landfill

Telephone: 206-780-3585

Report To (PM): Aaron Claiborne

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Fax: 206-780-5104

PM Email: aclaiborne@bainbridgewa.gov

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8) (Total Cu, Fe, Zn, Pb / Dissolved Fe)	Anions (IC)***	EDB (8011)	Alkalinity	Total Coliform			Comments
1 SWu-1	12-18-19	8:30	SW										2			1	1			unfiltered grab sample
2 SWD-1	12-18-19	9:00	SW										2			1	1			unfiltered grab sample
3 SWD-11 (Dup)	12-18-19	9:00	SW										2			1	1			unfiltered grab sample
4																				
5																				
6																				
7																				
8																				
9																				
10																				

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:

- ☑ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x	12-18-19 10:22	x	12/18/19 10:22
x	12/18/19 10:47	x	12/18/19 10:48

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Landfill Groundwater
Work Order Number: 2006366

June 30, 2020

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 7 sample(s) on 6/23/2020 for the analyses presented in the following report.

Dissolved Metals by EPA Method 200.8
Ion Chromatography by EPA Method 300.0
Total Metals by EPA Method 200.8
Total Alkalinity by SM 2320B
Total Suspended Solids (TSS) by SM 2540D
Volatile Organic Compounds by EPA Method 8260D SIM

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *06/30/2020*

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Work Order: 2006366

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2006366-001	BMW-12	06/23/2020 6:33 AM	06/23/2020 11:39 AM
2006366-002	BMW-13	06/23/2020 7:28 AM	06/23/2020 11:39 AM
2006366-003	BMW-14	06/23/2020 8:25 AM	06/23/2020 11:39 AM
2006366-004	BMW-114	06/23/2020 8:25 AM	06/23/2020 11:39 AM
2006366-005	BMW-15	06/23/2020 9:08 AM	06/23/2020 11:39 AM
2006366-006	BOW-37	06/23/2020 9:55 AM	06/23/2020 11:39 AM
2006366-007	Trip Blank	06/08/2020 11:04 AM	06/23/2020 11:39 AM

Case Narrative

WO#: **2006366**
Date: **6/30/2020**

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2006366**
Date Reported: **6/30/2020**

Client: City of Bainbridge Island
Collection Date: 6/23/2020 6:33:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2006366-001
Matrix: Groundwater
Client Sample ID: BMW-12

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 28844		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	6/30/2020 11:03:45 AM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/30/2020 11:03:45 AM
Surr: Dibromofluoromethane	101	80.6 - 124		%Rec	1	6/30/2020 11:03:45 AM
Surr: Toluene-d8	99.9	91.5 - 111		%Rec	1	6/30/2020 11:03:45 AM
Surr: 1-Bromo-4-fluorobenzene	97.9	79.4 - 117		%Rec	1	6/30/2020 11:03:45 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 28791		Analyst: SS
Chloride	4.59	0.200	D	mg/L	2	6/25/2020 11:41:00 AM
Nitrite (as N)	ND	0.100		mg/L	1	6/24/2020 4:10:00 PM
Nitrate (as N)	1.58	0.100		mg/L	1	6/24/2020 4:10:00 PM
Sulfate	7.70	0.300		mg/L	1	6/24/2020 4:10:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 28809		Analyst: CO
Calcium	13,800	100		µg/L	1	6/29/2020 5:25:13 PM
Iron	ND	100		µg/L	1	6/29/2020 5:25:13 PM
Magnesium	10,200	100		µg/L	1	6/29/2020 5:25:13 PM
Manganese	ND	2.00		µg/L	1	6/29/2020 5:25:13 PM
Potassium	954	500		µg/L	1	6/29/2020 5:25:13 PM
Sodium	6,960	100		µg/L	1	6/29/2020 5:25:13 PM
Total Metals by EPA Method 200.8				Batch ID: 28808		Analyst: CO
Manganese	ND	5.00		µg/L	1	6/25/2020 9:30:28 PM
Total Alkalinity by SM 2320B				Batch ID: R60193		Analyst: WF
Alkalinity, Bicarbonate (As CaCO3)	68.2	2.50		mg/L	1	6/30/2020 12:21:53 PM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	6/30/2020 12:21:53 PM
Alkalinity, Total (As CaCO3)	68.2	2.50		mg/L	1	6/30/2020 12:21:53 PM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R60115		Analyst: SS
Total Suspended Solids	ND	5.00		mg/L	1	6/26/2020 9:53:20 AM

Analytical Report

Work Order: **2006366**
Date Reported: **6/30/2020**

Client: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Lab ID: 2006366-002
Client Sample ID: **BMW-13**

Collection Date: 6/23/2020 7:28:00 AM
Matrix: Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 28844		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	6/30/2020 12:10:45 PM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/30/2020 12:10:45 PM
Surr: Dibromofluoromethane	101	80.6 - 124		%Rec	1	6/30/2020 12:10:45 PM
Surr: Toluene-d8	101	91.5 - 111		%Rec	1	6/30/2020 12:10:45 PM
Surr: 1-Bromo-4-fluorobenzene	98.3	79.4 - 117		%Rec	1	6/30/2020 12:10:45 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 28791		Analyst: SS
Chloride	5.13	0.500	D	mg/L	5	6/25/2020 12:04:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	6/24/2020 4:33:00 PM
Nitrate (as N)	1.50	0.100		mg/L	1	6/24/2020 4:33:00 PM
Sulfate	24.3	1.50	D	mg/L	5	6/25/2020 12:04:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 28809		Analyst: CO
Calcium	59,700	1,000	D	µg/L	10	6/29/2020 5:36:20 PM
Iron	ND	100		µg/L	1	6/29/2020 5:30:47 PM
Magnesium	55,300	1,000	D	µg/L	10	6/29/2020 5:36:20 PM
Manganese	2,910	20.0	D	µg/L	10	6/29/2020 5:36:20 PM
Potassium	1,960	500		µg/L	1	6/29/2020 5:30:47 PM
Sodium	16,000	100		µg/L	1	6/29/2020 5:30:47 PM
Total Metals by EPA Method 200.8				Batch ID: 28808		Analyst: CO
Manganese	2,950	50.0	D	µg/L	10	6/26/2020 5:00:34 PM
Total Alkalinity by SM 2320B				Batch ID: R60193		Analyst: WF
Alkalinity, Bicarbonate (As CaCO3)	361	2.50		mg/L	1	6/30/2020 12:21:53 PM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	6/30/2020 12:21:53 PM
Alkalinity, Total (As CaCO3)	361	2.50		mg/L	1	6/30/2020 12:21:53 PM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R60115		Analyst: SS
Total Suspended Solids	ND	5.00		mg/L	1	6/26/2020 9:53:20 AM

Analytical Report

Work Order: **2006366**
Date Reported: **6/30/2020**

Client: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Lab ID: 2006366-003
Client Sample ID: **BMW-14**

Collection Date: 6/23/2020 8:25:00 AM
Matrix: Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 28844		Analyst: CR
Vinyl chloride	0.164	0.0100		µg/L	1	6/30/2020 12:44:15 PM
1,1-Dichloroethene	0.0180	0.0100		µg/L	1	6/30/2020 12:44:15 PM
Surr: Dibromofluoromethane	99.0	80.6 - 124		%Rec	1	6/30/2020 12:44:15 PM
Surr: Toluene-d8	99.8	91.5 - 111		%Rec	1	6/30/2020 12:44:15 PM
Surr: 1-Bromo-4-fluorobenzene	96.9	79.4 - 117		%Rec	1	6/30/2020 12:44:15 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 28791		Analyst: SS
Chloride	9.16	0.500	D	mg/L	5	6/25/2020 12:27:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	6/24/2020 4:56:00 PM
Nitrate (as N)	0.107	0.100		mg/L	1	6/24/2020 4:56:00 PM
Sulfate	38.5	1.50	D	mg/L	5	6/25/2020 12:27:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 28809		Analyst: CO
Calcium	64,200	1,000	D	µg/L	10	6/29/2020 5:47:27 PM
Iron	ND	100		µg/L	1	6/29/2020 5:41:53 PM
Magnesium	61,100	1,000	D	µg/L	10	6/29/2020 5:47:27 PM
Manganese	41.1	2.00		µg/L	1	6/29/2020 5:41:53 PM
Potassium	3,020	500		µg/L	1	6/29/2020 5:41:53 PM
Sodium	31,900	1,000	D	µg/L	10	6/29/2020 5:47:27 PM
Total Metals by EPA Method 200.8				Batch ID: 28808		Analyst: CO
Manganese	42.1	5.00		µg/L	1	6/25/2020 9:41:35 PM
Total Alkalinity by SM 2320B				Batch ID: R60193		Analyst: WF
Alkalinity, Bicarbonate (As CaCO3)	403	2.50		mg/L	1	6/30/2020 12:21:53 PM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	6/30/2020 12:21:53 PM
Alkalinity, Total (As CaCO3)	403	2.50		mg/L	1	6/30/2020 12:21:53 PM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R60115		Analyst: SS
Total Suspended Solids	ND	5.00		mg/L	1	6/26/2020 9:53:20 AM

Analytical Report

Work Order: **2006366**
Date Reported: **6/30/2020**

Client: City of Bainbridge Island
Collection Date: 6/23/2020 8:25:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2006366-004
Matrix: Groundwater
Client Sample ID: BMW-114

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 28844		Analyst: CR
Vinyl chloride	0.166	0.0100		µg/L	1	6/30/2020 1:17:45 PM
1,1-Dichloroethene	0.0180	0.0100		µg/L	1	6/30/2020 1:17:45 PM
Surr: Dibromofluoromethane	99.8	80.6 - 124		%Rec	1	6/30/2020 1:17:45 PM
Surr: Toluene-d8	99.6	91.5 - 111		%Rec	1	6/30/2020 1:17:45 PM
Surr: 1-Bromo-4-fluorobenzene	98.0	79.4 - 117		%Rec	1	6/30/2020 1:17:45 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 28791		Analyst: SS
Chloride	9.22	0.500	D	mg/L	5	6/25/2020 12:50:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	6/24/2020 5:19:00 PM
Nitrate (as N)	0.114	0.100		mg/L	1	6/24/2020 5:19:00 PM
Sulfate	38.3	1.50	D	mg/L	5	6/25/2020 12:50:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 28809		Analyst: CO
Calcium	61,800	1,000	D	µg/L	10	6/29/2020 5:58:34 PM
Iron	ND	100		µg/L	1	6/29/2020 5:53:00 PM
Magnesium	60,000	1,000	D	µg/L	10	6/29/2020 5:58:34 PM
Manganese	40.6	2.00		µg/L	1	6/29/2020 5:53:00 PM
Potassium	3,010	500		µg/L	1	6/29/2020 5:53:00 PM
Sodium	31,300	1,000	D	µg/L	10	6/29/2020 5:58:34 PM
Total Metals by EPA Method 200.8				Batch ID: 28808		Analyst: CO
Manganese	42.1	5.00		µg/L	1	6/25/2020 9:47:08 PM
Total Alkalinity by SM 2320B				Batch ID: R60193		Analyst: WF
Alkalinity, Bicarbonate (As CaCO3)	393	2.50		mg/L	1	6/30/2020 12:21:53 PM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	6/30/2020 12:21:53 PM
Alkalinity, Total (As CaCO3)	393	2.50		mg/L	1	6/30/2020 12:21:53 PM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R60115		Analyst: SS
Total Suspended Solids	ND	5.00		mg/L	1	6/26/2020 9:53:20 AM

Analytical Report

Work Order: **2006366**
Date Reported: **6/30/2020**

Client: City of Bainbridge Island
Collection Date: 6/23/2020 9:08:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2006366-005
Matrix: Groundwater
Client Sample ID: BMW-15

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 28844		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	6/30/2020 1:51:12 PM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/30/2020 1:51:12 PM
Surr: Dibromofluoromethane	103	80.6 - 124		%Rec	1	6/30/2020 1:51:12 PM
Surr: Toluene-d8	100	91.5 - 111		%Rec	1	6/30/2020 1:51:12 PM
Surr: 1-Bromo-4-fluorobenzene	97.1	79.4 - 117		%Rec	1	6/30/2020 1:51:12 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 28791		Analyst: SS
Chloride	13.3	1.00	D	mg/L	10	6/25/2020 1:13:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	6/24/2020 5:42:00 PM
Nitrate (as N)	2.03	0.100		mg/L	1	6/24/2020 5:42:00 PM
Sulfate	110	3.00	D	mg/L	10	6/25/2020 1:13:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 28809		Analyst: CO
Calcium	63,000	1,000	D	µg/L	10	6/29/2020 6:09:41 PM
Iron	ND	100		µg/L	1	6/29/2020 6:04:07 PM
Magnesium	47,200	1,000	D	µg/L	10	6/29/2020 6:09:41 PM
Manganese	ND	2.00		µg/L	1	6/29/2020 6:04:07 PM
Potassium	3,010	500		µg/L	1	6/29/2020 6:04:07 PM
Sodium	64,800	1,000	D	µg/L	10	6/29/2020 6:09:41 PM
Total Metals by EPA Method 200.8				Batch ID: 28808		Analyst: CO
Manganese	ND	5.00		µg/L	1	6/25/2020 9:52:42 PM
Total Alkalinity by SM 2320B				Batch ID: R60193		Analyst: WF
Alkalinity, Bicarbonate (As CaCO3)	331	2.50		mg/L	1	6/30/2020 12:21:53 PM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	6/30/2020 12:21:53 PM
Alkalinity, Total (As CaCO3)	332	2.50		mg/L	1	6/30/2020 12:21:53 PM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R60115		Analyst: SS
Total Suspended Solids	ND	5.00		mg/L	1	6/26/2020 9:53:20 AM

Analytical Report

Work Order: **2006366**
Date Reported: **6/30/2020**

Client: City of Bainbridge Island
Collection Date: 6/23/2020 9:55:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2006366-006
Matrix: Groundwater
Client Sample ID: BOW-37

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 28844		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	6/30/2020 2:24:42 PM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/30/2020 2:24:42 PM
Surr: Dibromofluoromethane	101	80.6 - 124		%Rec	1	6/30/2020 2:24:42 PM
Surr: Toluene-d8	102	91.5 - 111		%Rec	1	6/30/2020 2:24:42 PM
Surr: 1-Bromo-4-fluorobenzene	97.9	79.4 - 117		%Rec	1	6/30/2020 2:24:42 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 28791		Analyst: SS
Chloride	5.30	0.500	D	mg/L	5	6/25/2020 1:36:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	6/24/2020 6:05:00 PM
Nitrate (as N)	1.19	0.100		mg/L	1	6/24/2020 6:05:00 PM
Sulfate	8.20	0.300		mg/L	1	6/24/2020 6:05:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 28809		Analyst: CO
Calcium	20,600	1,000	D	µg/L	10	6/29/2020 6:31:57 PM
Iron	ND	100		µg/L	1	6/29/2020 6:15:15 PM
Magnesium	15,600	1,000	D	µg/L	10	6/29/2020 6:31:57 PM
Manganese	ND	2.00		µg/L	1	6/29/2020 6:15:15 PM
Potassium	1,940	500		µg/L	1	6/29/2020 6:15:15 PM
Sodium	17,100	1,000	D	µg/L	10	6/29/2020 6:31:57 PM
Total Metals by EPA Method 200.8				Batch ID: 28808		Analyst: CO
Manganese	ND	5.00		µg/L	1	6/25/2020 9:58:15 PM
Total Alkalinity by SM 2320B				Batch ID: R60193		Analyst: WF
Alkalinity, Bicarbonate (As CaCO3)	156	2.50		mg/L	1	6/30/2020 12:21:53 PM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	6/30/2020 12:21:53 PM
Alkalinity, Total (As CaCO3)	156	2.50		mg/L	1	6/30/2020 12:21:53 PM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R60115		Analyst: SS
Total Suspended Solids	ND	5.00		mg/L	1	6/26/2020 9:53:20 AM

Work Order: 2006366
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: **MB-R60193**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **6/30/2020**			RunNo: **60193**		
Client ID: **MBLKW**	Batch ID: **R60193**					Analysis Date: **6/30/2020**			SeqNo: **1205300**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-R60193**	SampType: **LCS**			Units: **mg/L**		Prep Date: **6/30/2020**			RunNo: **60193**		
Client ID: **LCSW**	Batch ID: **R60193**					Analysis Date: **6/30/2020**			SeqNo: **1205301**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	102	2.50	100.0	0	102	94.3	116				

Sample ID: **2006366-001DDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **6/30/2020**			RunNo: **60193**		
Client ID: **BMW-12**	Batch ID: **R60193**					Analysis Date: **6/30/2020**			SeqNo: **1205303**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	65.8	2.50						68.25	3.64	20	

Work Order: 2006366
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **MB-28791** SampType: **MBLK** Units: **mg/L** Prep Date: **6/24/2020** RunNo: **60103**
Client ID: **MBLKW** Batch ID: **28791** Analysis Date: **6/24/2020** SeqNo: **1203275**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									
Nitrite (as N)	ND	0.100									
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.300									

Sample ID: **LCS-28791** SampType: **LCS** Units: **mg/L** Prep Date: **6/24/2020** RunNo: **60103**
Client ID: **LCSW** Batch ID: **28791** Analysis Date: **6/24/2020** SeqNo: **1203276**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.703	0.100	0.7500	0	93.7	90	110				
Nitrite (as N)	0.704	0.100	0.7500	0	93.9	90	110				
Nitrate (as N)	0.699	0.100	0.7500	0	93.2	90	110				
Sulfate	3.52	0.300	3.750	0	93.9	90	110				

Sample ID: **2006361-001ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **6/24/2020** RunNo: **60103**
Client ID: **BATCH** Batch ID: **28791** Analysis Date: **6/24/2020** SeqNo: **1203279**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	108	10.0						107.5	0.279	20	D
Nitrite (as N)	ND	10.0						0		20	D
Nitrate (as N)	ND	10.0						0		20	D
Sulfate	39.2	30.0						39.30	0.255	20	D

NOTES:
Diluted due to matrix.

Sample ID: **2006361-001AMS** SampType: **MS** Units: **mg/L** Prep Date: **6/24/2020** RunNo: **60103**
Client ID: **BATCH** Batch ID: **28791** Analysis Date: **6/24/2020** SeqNo: **1203280**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	185	10.0	75.00	107.5	103	80	120				D

Work Order: 2006366
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **2006361-001AMS** SampType: **MS** Units: **mg/L** Prep Date: **6/24/2020** RunNo: **60103**
Client ID: **BATCH** Batch ID: **28791** Analysis Date: **6/24/2020** SeqNo: **1203280**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	71.9	10.0	75.00	0	95.9	80	120				D
Nitrate (as N)	71.7	10.0	75.00	6.200	87.3	80	120				D
Sulfate	375	30.0	375.0	39.30	89.5	80	120				D

Sample ID: **2006361-001AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **6/24/2020** RunNo: **60103**
Client ID: **BATCH** Batch ID: **28791** Analysis Date: **6/24/2020** SeqNo: **1203281**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	185	10.0	75.00	107.5	103	80	120	184.6	0.162	20	D
Nitrite (as N)	70.4	10.0	75.00	0	93.9	80	120	71.90	2.11	20	D
Nitrate (as N)	71.3	10.0	75.00	6.200	86.8	80	120	71.70	0.559	20	D
Sulfate	377	30.0	375.0	39.30	89.9	80	120	375.1	0.399	20	D

Work Order: 2006366
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Suspended Solids (TSS) by SM 2540D

Sample ID: **MB-R60115**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **6/26/2020**			RunNo: **60115**	
Client ID: **MBLKW**	Batch ID: **R60115**					Analysis Date: **6/26/2020**			SeqNo: **1203582**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Suspended Solids	ND	5.00									

Sample ID: **LCS-R60115**	SampType: **LCS**			Units: **mg/L**		Prep Date: **6/26/2020**			RunNo: **60115**	
Client ID: **LCSW**	Batch ID: **R60115**					Analysis Date: **6/26/2020**			SeqNo: **1203583**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Suspended Solids	298	5.00	300.0	0	99.3	65	135				

Sample ID: **2006366-001DDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **6/26/2020**			RunNo: **60115**	
Client ID: **BMW-12**	Batch ID: **R60115**					Analysis Date: **6/26/2020**			SeqNo: **1203585**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Suspended Solids	ND	5.00						0		30	

Work Order: 2006366
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-28809** SampType: **MBLK** Units: **µg/L** Prep Date: **6/25/2020** RunNo: **60145**
Client ID: **MBLKW** Batch ID: **28809** Analysis Date: **6/26/2020** SeqNo: **1204325**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	100									
Iron	ND	100									
Magnesium	ND	100									
Manganese	ND	2.00									
Potassium	ND	500									
Sodium	ND	100									

Sample ID: **LCS-28809** SampType: **LCS** Units: **µg/L** Prep Date: **6/25/2020** RunNo: **60145**
Client ID: **LCSW** Batch ID: **28809** Analysis Date: **6/26/2020** SeqNo: **1204326**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	1,100	100	1,000	0	110	50	150				
Iron	970	100	1,000	0	97.0	50	150				
Magnesium	1,010	100	1,000	0	101	50	150				
Manganese	107	2.00	100.0	0	107	85	115				
Potassium	1,070	500	1,000	0	107	50	150				
Sodium	1,090	100	1,000	0	109	50	150				

Sample ID: **2006355-001CDUP** SampType: **DUP** Units: **µg/L** Prep Date: **6/25/2020** RunNo: **60145**
Client ID: **BATCH** Batch ID: **28809** Analysis Date: **6/26/2020** SeqNo: **1204328**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	16,800	100						17,080	1.74	30	
Iron	ND	100						0		30	
Magnesium	7,010	100						7,127	1.62	30	
Manganese	4.37	2.00						4.689	7.15	30	
Potassium	1,400	500						1,495	6.25	30	
Sodium	7,450	100						8,032	7.46	30	

Work Order: 2006366
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **2006355-001CMS** SampType: **MS** Units: **µg/L** Prep Date: **6/25/2020** RunNo: **60145**
Client ID: **BATCH** Batch ID: **28809** Analysis Date: **6/26/2020** SeqNo: **1204329**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	21,300	100	5,000	17,080	85.3	50	150				
Iron	4,810	100	5,000	28.49	95.7	50	150				
Magnesium	11,800	100	5,000	7,127	93.7	70	130				
Manganese	531	2.00	500.0	4.689	105	70	130				
Potassium	6,440	500	5,000	1,495	98.8	50	150				
Sodium	12,200	100	5,000	8,032	83.4	50	150				

Sample ID: **2006355-001CMSD** SampType: **MSD** Units: **µg/L** Prep Date: **6/25/2020** RunNo: **60145**
Client ID: **BATCH** Batch ID: **28809** Analysis Date: **6/26/2020** SeqNo: **1204330**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	20,800	100	5,000	17,080	74.2	50	150	21,350	2.65	30	
Iron	4,730	100	5,000	28.49	93.9	50	150	4,813	1.83	30	
Magnesium	11,400	100	5,000	7,127	84.9	70	130	11,810	3.79	30	
Manganese	513	2.00	500.0	4.689	102	70	130	530.8	3.35	30	
Potassium	6,420	500	5,000	1,495	98.5	50	150	6,436	0.270	30	
Sodium	12,300	100	5,000	8,032	86.3	50	150	12,200	1.19	30	

Work Order: 2006366
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **MB-28808**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **6/25/2020**			RunNo: **60123**	
Client ID: **MBLKW**	Batch ID: **28808**					Analysis Date: **6/25/2020**			SeqNo: **1203877**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	5.00									

Sample ID: **2006355-001BDUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **6/25/2020**			RunNo: **60123**	
Client ID: **BATCH**	Batch ID: **28808**					Analysis Date: **6/25/2020**			SeqNo: **1203880**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	91.7	5.00						93.87	2.31	30	

Sample ID: **2006355-001BMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **6/25/2020**			RunNo: **60123**	
Client ID: **BATCH**	Batch ID: **28808**					Analysis Date: **6/25/2020**			SeqNo: **1203881**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	689	5.00	500.0	93.87	119	70	130				

Sample ID: **2006355-001BMSD**	SampType: **MSD**			Units: **µg/L**		Prep Date: **6/25/2020**			RunNo: **60123**	
Client ID: **BATCH**	Batch ID: **28808**					Analysis Date: **6/25/2020**			SeqNo: **1203882**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	674	5.00	500.0	93.87	116	70	130	689.4	2.30	30	

Sample ID: **LCS-28808**	SampType: **LCS**			Units: **µg/L**		Prep Date: **6/25/2020**			RunNo: **60123**	
Client ID: **LCSW**	Batch ID: **28808**					Analysis Date: **6/26/2020**			SeqNo: **1204741**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	105	5.00	100.0	0	105	85	115				

Work Order: 2006366
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D SIM

Sample ID: **LCS-28844** SampType: **LCS** Units: **µg/L** Prep Date: **6/30/2020** RunNo: **60199**
Client ID: **LCSW** Batch ID: **28844** Analysis Date: **6/30/2020** SeqNo: **1205647**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	4.40	0.0100	5.000	0	87.9	69.9	132				
1,1-Dichloroethene	4.65	0.0100	5.000	0	93.0	55.2	144				
Surr: Dibromofluoromethane	9.83		10.00		98.3	80.6	124				
Surr: Toluene-d8	9.99		10.00		99.9	91.5	111				
Surr: 1-Bromo-4-fluorobenzene	9.96		10.00		99.6	79.4	117				

Sample ID: **MB-28844** SampType: **MBLK** Units: **µg/L** Prep Date: **6/30/2020** RunNo: **60199**
Client ID: **MBLKW** Batch ID: **28844** Analysis Date: **6/30/2020** SeqNo: **1205648**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100									
1,1-Dichloroethene	ND	0.0100									
Surr: Dibromofluoromethane	10.1		10.00		101	80.6	124				
Surr: Toluene-d8	10.0		10.00		100	91.5	111				
Surr: 1-Bromo-4-fluorobenzene	9.84		10.00		98.4	79.4	117				

Sample ID: **2006366-001ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **6/30/2020** RunNo: **60199**
Client ID: **BMW-12** Batch ID: **28844** Analysis Date: **6/30/2020** SeqNo: **1205637**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100						0		30	
1,1-Dichloroethene	ND	0.0100						0		30	
Surr: Dibromofluoromethane	10.1		10.00		101	80.6	124		0		
Surr: Toluene-d8	10.1		10.00		101	91.5	111		0		
Surr: 1-Bromo-4-fluorobenzene	9.77		10.00		97.7	79.4	117		0		

Work Order: 2006366
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D SIM

Sample ID: **2006366-002AMS** SampType: **MS** Units: **µg/L** Prep Date: **6/30/2020** RunNo: **60199**
Client ID: **BMW-13** Batch ID: **28844** Analysis Date: **6/30/2020** SeqNo: **1205639**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	4.46	0.0100	5.000	0	89.3	60.1	138				
1,1-Dichloroethene	4.88	0.0100	5.000	0	97.5	81	137				
Surr: Dibromofluoromethane	10.2		10.00		102	80.6	124				
Surr: Toluene-d8	9.91		10.00		99.1	91.5	111				
Surr: 1-Bromo-4-fluorobenzene	9.85		10.00		98.5	79.4	117				

Sample ID: **2006366-002AMSD** SampType: **MSD** Units: **µg/L** Prep Date: **6/30/2020** RunNo: **60199**
Client ID: **BMW-13** Batch ID: **28844** Analysis Date: **6/30/2020** SeqNo: **1205640**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	4.31	0.0100	5.000	0	86.2	60.1	138	4.464	3.49	30	
1,1-Dichloroethene	4.72	0.0100	5.000	0	94.3	81	137	4.877	3.33	30	
Surr: Dibromofluoromethane	10.2		10.00		102	80.6	124		0		
Surr: Toluene-d8	9.92		10.00		99.2	91.5	111		0		
Surr: 1-Bromo-4-fluorobenzene	9.86		10.00		98.6	79.4	117		0		

Sample Log-In Check List

Client Name:	**COBI**	Work Order Number:	**2006366**
Logged by:	**Clare Griggs**	Date Received:	**6/23/2020 11:39:00 AM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes	☑	No	☐	Not Present ☐
2.	How was the sample delivered?	Courier				

Log In

3.	Coolers are present?	Yes	☑	No	☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes	☑	No	☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes	☐	No	☐	Not Present ☑
6.	Was an attempt made to cool the samples?	Yes	☑	No	☐	NA ☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes	☑	No	☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes	☑	No	☐	
9.	Sufficient sample volume for indicated test(s)?	Yes	☑	No	☐	
10.	Are samples properly preserved?	Yes	☑	No	☐	
11.	Was preservative added to bottles?	Yes	☐	No	☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes	☐	No	☑	NA ☐
13.	Did all samples containers arrive in good condition(unbroken)?	Yes	☑	No	☐	
14.	Does paperwork match bottle labels?	Yes	☑	No	☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes	☑	No	☐	
16.	Is it clear what analyses were requested?	Yes	☑	No	☐	
17.	Were all holding times able to be met?	Yes	☑	No	☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes	☑	No	☐	NA ☐

Person Notified:	Rav Navarette	Date:	6/23/2020
By Whom:	Clare Griggs	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Confirming select list.		
Client Instructions:	Client provided table with select list for Groundwater Sampling samples.		

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler	1.4
Sample	5.7

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 6-23-20 Page: 1 of: 1

Laboratory Project No (internal): 2006360

Special Remarks:

Project Name: Vincent Landfill Groundwater

Project No:

Client: City of Bainbridge Is

Collected by: Ray Navarette

Address: 7305 Hidden Cove Rd NE

Location: Vincent Landfill

City, State, Zip: Bainbridge Is, WA 98110

Report To (PM): Aaron Claborne

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Telephone: 206-786-2131

Fax: 206-780-5104

PM Email: AClaborne@bainbridgewa.gov

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T)	Dissolved (D)	Anions (IC)*** TSS Alkalinity	EDB (8011)	Comments
1 BmW-12	6-23	6:33	GW	3									1	1	1			
2 BmW-13	6-23	7:28	GW	5									1	1	1			
3 BmW-14	6-23	8:25	GW	3									1	1	1			
4 BmW-114	6-23	8:35	GW	3									1	1	1			
5 BmW-15	6-23	9:08	GW	3									1	1	1			
6 BOW-37	6-23	9:55	GW	3									1	1	1			
7																		
8																		
9																		
10																		

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite TSS Alkalinity

Turn-around Time:

- ☒ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x	6-23-20	x	6/23/2020 11:05A
x	6/23/2020 11:39A	x	6/23/20 @ 1139

Table 1
Updated Sampling Analytes for Surface Water and Groundwater
120097-003, Vincent Road Landfill, Bainbridge Island, WA

Contaminant	Analytical Method	Lab Reporting Limit (with no dilution)	Cleanup Level[1]
Surface Water Sampling			
Field Parameters			
Conductivity			-
Dissolved Oxygen			>9.5 mg/L
ORP			-
pH			-
Temperature			-
Turbidity			5.0 NTU
Conventionals			
Alkalinity as CaCO3	SM 2320B	5 mg/L	20 mg/L
Total Metals (not field filtered)			
Iron	EPA 200.8	100 ug/L	1000 ug/L
Lead	EPA 200.8 (LL)	TBD	-
Dissolved Metals (field filtered)			
Copper	EPA 200.8	1 ug/L	1.8 ug/L
Iron	EPA 200.8	100 ug/L	1000 ug/L
Lead	EPA 200.8	0.5 ug/L[2]	0.3 ug/L
Zinc	EPA 200.8	2.5 ug/L	21 ug/L
Bacteria			
E. Coli	EPA 1604	1 CFU/100mL	-
Fecal Coliform	SM 9222D	1 CFU/100mL	<50 CFU/100mL
Total Coliform	SM 9222D	1 CFU/100mL	<50 CFU/100mL
Groundwater Sampling			
Field Parameters			
Conductivity[3]			700 umhos/cm
Dissolved Oxygen			-
ORP			-
pH[4]			6.5-8.5
Temperature			-
Turbidity			-
Conventionals[5]			
Alkalinity as CaCO3	SM 2320B	5 mg/L	-
Bicarbonate as CaCO3	SM 2320B	5 mg/L	Geochemical
Carbonate as CaCO3	SM 2320B	5 mg/L	Geochemical
Chloride	EPA 300.0	0.2 mg/L	Geochemical
Nitrate as N	EPA 300.0	0.1 mg/L	-
Nitrite as N	EPA 300.0	0.1 mg/L	
Sulfate	EPA 300.0	0.3 mg/L	Geochemical
Total Suspended Solids (TSS)	SM 2540D		Geochemical
Total Metals (not field filtered)			
Manganese (Total)	200.8	5 ug/L	50 ug/L
Dissolved Metals (field filtered)			
Calcium	200.8	100 ug/L	Geochemical
Iron (Dissolved)	200.8	100 ug/L	Geochemical
Magnesium	200.8	100 ug/L	Geochemical
Manganese (Dissolved)	200.8	2 ug/L	Geochemical
Potassium	200.8	500 ug/L	Geochemical
Sodium	200.8	100 ug/L	Geochemical
VOCs			
1,1-dichloroethene	EPA 6260D SIM	0.01 ug/L	0.073 ug/L
vinyl chloride	EPA 6260D SIM	0.01 ug/L	0.023 ug/L

Notes:
1. Cleanup levels adopted by the Consent Decree (Ecology 2001), adapted from Table 1 of the CAP.
2. Fremont Analytical can provide estimates of values below the reporting limit 0.5 ug/L flagged with a "J".
3. The secondary drinking water standard for conductivity is 700 umhos/cm.
4. The secondary drinking water standard for pH 6.5-8.5.
5. Geochemical parameters were required by Ecology based on letter from Tamara Welty dated January 10, 2019.

Abbreviations
μg/L = micrograms per liter
mg/L = milligrams per liter
VOCs = volatile organic compounds
CFU/mL = colony forming units per 100 milliliters of sample
(-) = Not established

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
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info@fremontanalytical.com

City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Landfill Groundwater
Work Order Number: 2012271

December 30, 2020

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 7 sample(s) on 12/16/2020 for the analyses presented in the following report.

Dissolved Metals by EPA Method 200.8
Ion Chromatography by EPA Method 300.0
Total Metals by EPA Method 200.8
Total Alkalinity by SM 2320B
Total Suspended Solids (TSS) by SM 2540D
Volatile Organic Compounds by EPA Method 8260D

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.3 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910

Date: *12/30/2020*

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Work Order: 2012271

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2012271-001	BMW-12	12/16/2020 6:45 AM	12/16/2020 1:30 PM
2012271-002	BMW-13	12/16/2020 7:50 AM	12/16/2020 1:30 PM
2012271-003	BMW-14	12/16/2020 8:45 AM	12/16/2020 1:30 PM
2012271-004	BMW-114	12/16/2020 8:45 AM	12/16/2020 1:30 PM
2012271-005	BMW-15	12/16/2020 9:40 AM	12/16/2020 1:30 PM
2012271-006	BOW-37	12/16/2020 11:30 AM	12/16/2020 1:30 PM
2012271-007	Trip Blank	12/14/2020 2:58 PM	12/16/2020 1:30 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2012271**
Date: **12/30/2020**

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2012271**
Date Reported: **12/30/2020**

Client: City of Bainbridge Island
Collection Date: 12/16/2020 6:45:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2012271-001
Matrix: Groundwater
Client Sample ID: BMW-12

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30768		Analyst: KT
Vinyl chloride	ND	0.200		µg/L	1	12/18/2020 7:00:08 PM
1,1-Dichloroethane	ND	1.00		µg/L	1	12/18/2020 7:00:08 PM
Surr: Dibromofluoromethane	101	87.8 - 114		%Rec	1	12/18/2020 7:00:08 PM
Surr: Toluene-d8	102	90.6 - 109		%Rec	1	12/18/2020 7:00:08 PM
Surr: 1-Bromo-4-fluorobenzene	97.2	88.6 - 111		%Rec	1	12/18/2020 7:00:08 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 30795		Analyst: TN
Nitrate (as N)+Nitrite (as N)	1.47	0.100		mg/L	1	12/21/2020 9:12:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 30794		Analyst: CO
Calcium	11,900	100		µg/L	1	12/24/2020 5:01:16 PM
Iron	ND	100		µg/L	1	12/24/2020 5:01:16 PM
Magnesium	9,380	100		µg/L	1	12/24/2020 5:01:16 PM
Manganese	ND	2.00		µg/L	1	12/24/2020 5:01:16 PM
Potassium	861	200		µg/L	1	12/24/2020 5:01:16 PM
Sodium	6,760	100		µg/L	1	12/24/2020 5:01:16 PM
Total Metals by EPA Method 200.8				Batch ID: 30797		Analyst: CO
Calcium	13,000	200		µg/L	1	12/22/2020 12:59:29 PM
Iron	ND	100		µg/L	1	12/22/2020 12:59:29 PM
Magnesium	10,700	100		µg/L	1	12/22/2020 12:59:29 PM
Manganese	ND	5.00		µg/L	1	12/22/2020 12:59:29 PM
Potassium	1,030	200		µg/L	1	12/22/2020 12:59:29 PM
Sodium	7,520	200		µg/L	1	12/22/2020 12:59:29 PM
Total Alkalinity by SM 2320B				Batch ID: R64250		Analyst: TN
Alkalinity, Total (As CaCO3)	58.8	2.50		mg/L	1	12/23/2020 12:52:00 PM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R64203		Analyst: SS
Total Suspended Solids	5.00	5.00		mg/L	1	12/22/2020 1:41:06 PM

Analytical Report

Work Order: **2012271**
Date Reported: **12/30/2020**

Client: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Lab ID: 2012271-002
Client Sample ID: **BMW-13**

Collection Date: 12/16/2020 7:50:00 AM
Matrix: Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30768		Analyst: KT
Vinyl chloride	ND	0.200		µg/L	1	12/18/2020 7:31:06 PM
1,1-Dichloroethane	ND	1.00		µg/L	1	12/18/2020 7:31:06 PM
Surr: Dibromofluoromethane	101	87.8 - 114		%Rec	1	12/18/2020 7:31:06 PM
Surr: Toluene-d8	102	90.6 - 109		%Rec	1	12/18/2020 7:31:06 PM
Surr: 1-Bromo-4-fluorobenzene	97.4	88.6 - 111		%Rec	1	12/18/2020 7:31:06 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 30795		Analyst: TN
Nitrate (as N)+Nitrite (as N)	1.44	0.100		mg/L	1	12/21/2020 9:35:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 30794		Analyst: CO
Calcium	81,800	1,000	D	µg/L	10	12/24/2020 5:23:32 PM
Iron	ND	100		µg/L	1	12/24/2020 5:29:06 PM
Magnesium	77,600	1,000	D	µg/L	10	12/24/2020 5:23:32 PM
Manganese	4,930	20.0	D	µg/L	10	12/24/2020 5:23:32 PM
Potassium	2,280	200		µg/L	1	12/24/2020 5:29:06 PM
Sodium	18,000	100		µg/L	1	12/24/2020 5:29:06 PM
Total Metals by EPA Method 200.8				Batch ID: 30797		Analyst: CO
Calcium	87,600	2,000	D	µg/L	10	12/24/2020 3:48:49 PM
Iron	ND	100		µg/L	1	12/22/2020 1:27:20 PM
Magnesium	81,000	1,000	D	µg/L	10	12/24/2020 3:48:49 PM
Manganese	4,540	50.0	D	µg/L	10	12/24/2020 3:48:49 PM
Potassium	2,460	200		µg/L	1	12/22/2020 1:27:20 PM
Sodium	19,000	200		µg/L	1	12/22/2020 1:27:20 PM
Total Alkalinity by SM 2320B				Batch ID: R64250		Analyst: TN
Alkalinity, Total (As CaCO3)	519	2.50		mg/L	1	12/23/2020 12:52:00 PM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R64203		Analyst: SS
Total Suspended Solids	5.00	5.00		mg/L	1	12/22/2020 1:41:06 PM

Analytical Report

Work Order: **2012271**
Date Reported: **12/30/2020**

Client: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Lab ID: 2012271-003
Client Sample ID: **BMW-14**

Collection Date: 12/16/2020 8:45:00 AM
Matrix: Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30768		Analyst: KT
Vinyl chloride	ND	0.200		µg/L	1	12/18/2020 8:02:02 PM
1,1-Dichloroethane	ND	1.00		µg/L	1	12/18/2020 8:02:02 PM
Surr: Dibromofluoromethane	101	87.8 - 114		%Rec	1	12/18/2020 8:02:02 PM
Surr: Toluene-d8	103	90.6 - 109		%Rec	1	12/18/2020 8:02:02 PM
Surr: 1-Bromo-4-fluorobenzene	97.4	88.6 - 111		%Rec	1	12/18/2020 8:02:02 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 30795		Analyst: TN
Nitrate (as N)+Nitrite (as N)	ND	0.100		mg/L	1	12/22/2020 9:51:00 AM
Dissolved Metals by EPA Method 200.8				Batch ID: 30794		Analyst: CO
Calcium	64,000	1,000	D	µg/L	10	12/24/2020 5:34:40 PM
Iron	ND	100		µg/L	1	12/24/2020 5:40:14 PM
Magnesium	63,100	1,000	D	µg/L	10	12/24/2020 5:34:40 PM
Manganese	74.2	2.00		µg/L	1	12/24/2020 5:40:14 PM
Potassium	2,720	200		µg/L	1	12/24/2020 5:40:14 PM
Sodium	27,000	1,000	D	µg/L	10	12/30/2020 10:11:24 AM
Total Metals by EPA Method 200.8				Batch ID: 30797		Analyst: CO
Calcium	62,800	2,000	D	µg/L	10	12/24/2020 3:54:23 PM
Iron	ND	100		µg/L	1	12/22/2020 1:32:54 PM
Magnesium	59,600	1,000	D	µg/L	10	12/24/2020 3:54:23 PM
Manganese	72.6	5.00		µg/L	1	12/22/2020 1:32:54 PM
Potassium	2,850	200		µg/L	1	12/22/2020 1:32:54 PM
Sodium	28,500	2,000	D	µg/L	10	12/24/2020 3:54:23 PM
Total Alkalinity by SM 2320B				Batch ID: R64250		Analyst: TN
Alkalinity, Total (As CaCO3)	384	2.50		mg/L	1	12/23/2020 12:52:00 PM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R64203		Analyst: SS
Total Suspended Solids	8.00	5.00		mg/L	1	12/22/2020 1:41:06 PM

Analytical Report

Work Order: **2012271**
Date Reported: **12/30/2020**

Client: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Lab ID: 2012271-004
Client Sample ID: **BMW-114**

Collection Date: 12/16/2020 8:45:00 AM
Matrix: Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30768		Analyst: KT
Vinyl chloride	ND	0.200		µg/L	1	12/18/2020 8:32:59 PM
1,1-Dichloroethane	ND	1.00		µg/L	1	12/18/2020 8:32:59 PM
Surr: Dibromofluoromethane	101	87.8 - 114		%Rec	1	12/18/2020 8:32:59 PM
Surr: Toluene-d8	103	90.6 - 109		%Rec	1	12/18/2020 8:32:59 PM
Surr: 1-Bromo-4-fluorobenzene	97.1	88.6 - 111		%Rec	1	12/18/2020 8:32:59 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 30795		Analyst: TN
Nitrate (as N)+Nitrite (as N)	ND	0.100		mg/L	1	12/22/2020 10:14:00 AM
Dissolved Metals by EPA Method 200.8				Batch ID: 30794		Analyst: CO
Calcium	59,200	1,000	D	µg/L	10	12/24/2020 5:45:48 PM
Iron	ND	100		µg/L	1	12/24/2020 5:51:22 PM
Magnesium	54,800	1,000	D	µg/L	10	12/24/2020 5:45:48 PM
Manganese	73.2	2.00		µg/L	1	12/24/2020 5:51:22 PM
Potassium	2,790	200		µg/L	1	12/24/2020 5:51:22 PM
Sodium	27,300	1,000	D	µg/L	10	12/30/2020 10:17:06 AM
Total Metals by EPA Method 200.8				Batch ID: 30797		Analyst: CO
Calcium	61,000	2,000	D	µg/L	10	12/24/2020 3:59:57 PM
Iron	ND	100		µg/L	1	12/22/2020 1:38:28 PM
Magnesium	60,100	1,000	D	µg/L	10	12/24/2020 3:59:57 PM
Manganese	71.5	5.00		µg/L	1	12/22/2020 1:38:28 PM
Potassium	2,810	200		µg/L	1	12/22/2020 1:38:28 PM
Sodium	28,200	2,000	D	µg/L	10	12/24/2020 3:59:57 PM
Total Alkalinity by SM 2320B				Batch ID: R64250		Analyst: TN
Alkalinity, Total (As CaCO3)	389	2.50		mg/L	1	12/23/2020 12:52:00 PM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R64203		Analyst: SS
Total Suspended Solids	7.00	5.00		mg/L	1	12/22/2020 1:41:06 PM

Analytical Report

Work Order: **2012271**
Date Reported: **12/30/2020**

Client: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Lab ID: 2012271-005
Client Sample ID: **BMW-15**

Collection Date: 12/16/2020 9:40:00 AM
Matrix: Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30768		Analyst: KT
Vinyl chloride	ND	0.200		µg/L	1	12/18/2020 9:03:56 PM
1,1-Dichloroethane	ND	1.00		µg/L	1	12/18/2020 9:03:56 PM
Surr: Dibromofluoromethane	103	87.8 - 114		%Rec	1	12/18/2020 9:03:56 PM
Surr: Toluene-d8	104	90.6 - 109		%Rec	1	12/18/2020 9:03:56 PM
Surr: 1-Bromo-4-fluorobenzene	100	88.6 - 111		%Rec	1	12/18/2020 9:03:56 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 30795		Analyst: TN
Nitrate (as N)+Nitrite (as N)	2.95	0.200	D	mg/L	2	12/22/2020 10:37:00 AM
Dissolved Metals by EPA Method 200.8				Batch ID: 30794		Analyst: CO
Calcium	49,400	1,000	D	µg/L	10	12/24/2020 6:13:41 PM
Iron	ND	100		µg/L	1	12/24/2020 6:19:15 PM
Magnesium	41,000	1,000	D	µg/L	10	12/24/2020 6:13:41 PM
Manganese	ND	2.00		µg/L	1	12/24/2020 6:19:15 PM
Potassium	2,690	200		µg/L	1	12/24/2020 6:19:15 PM
Sodium	54,800	1,000	D	µg/L	10	12/24/2020 6:13:41 PM
Total Metals by EPA Method 200.8				Batch ID: 30797		Analyst: CO
Calcium	54,000	2,000	D	µg/L	10	12/24/2020 4:05:31 PM
Iron	ND	100		µg/L	1	12/22/2020 7:45:45 PM
Magnesium	42,400	1,000	D	µg/L	10	12/24/2020 4:05:31 PM
Manganese	ND	5.00		µg/L	1	12/22/2020 7:45:45 PM
Potassium	2,670	200		µg/L	1	12/22/2020 7:45:45 PM
Sodium	56,500	2,000	D	µg/L	10	12/24/2020 4:05:31 PM
Total Alkalinity by SM 2320B				Batch ID: R64250		Analyst: TN
Alkalinity, Total (As CaCO3)	304	2.50		mg/L	1	12/23/2020 12:52:00 PM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R64203		Analyst: SS
Total Suspended Solids	ND	5.00		mg/L	1	12/22/2020 1:41:06 PM

Analytical Report

Work Order: **2012271**
Date Reported: **12/30/2020**

Client: City of Bainbridge Island
Collection Date: 12/16/2020 11:30:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2012271-006
Matrix: Groundwater
Client Sample ID: BOW-37

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30768		Analyst: KT
Vinyl chloride	ND	0.200		µg/L	1	12/18/2020 9:34:53 PM
1,1-Dichloroethane	ND	1.00		µg/L	1	12/18/2020 9:34:53 PM
Surr: Dibromofluoromethane	102	87.8 - 114		%Rec	1	12/18/2020 9:34:53 PM
Surr: Toluene-d8	104	90.6 - 109		%Rec	1	12/18/2020 9:34:53 PM
Surr: 1-Bromo-4-fluorobenzene	96.5	88.6 - 111		%Rec	1	12/18/2020 9:34:53 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 30795		Analyst: TN
Nitrate (as N)+Nitrite (as N)	1.07	0.100		mg/L	1	12/21/2020 11:54:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 30794		Analyst: CO
Calcium	22,000	100		µg/L	1	12/24/2020 6:30:23 PM
Iron	ND	100		µg/L	1	12/24/2020 6:30:23 PM
Magnesium	20,300	100		µg/L	1	12/24/2020 6:30:23 PM
Manganese	2.74	2.00		µg/L	1	12/24/2020 6:30:23 PM
Potassium	1,860	200		µg/L	1	12/24/2020 6:30:23 PM
Sodium	17,400	100		µg/L	1	12/24/2020 6:30:23 PM
Total Metals by EPA Method 200.8				Batch ID: 30797		Analyst: CO
Calcium	22,800	200		µg/L	1	12/22/2020 7:50:20 PM
Iron	ND	100		µg/L	1	12/22/2020 7:50:20 PM
Magnesium	20,100	100		µg/L	1	12/22/2020 7:50:20 PM
Manganese	ND	5.00		µg/L	1	12/22/2020 7:50:20 PM
Potassium	2,020	200		µg/L	1	12/22/2020 7:50:20 PM
Sodium	18,000	200		µg/L	1	12/22/2020 7:50:20 PM
Total Alkalinity by SM 2320B				Batch ID: R64250		Analyst: TN
Alkalinity, Total (As CaCO3)	146	2.50		mg/L	1	12/23/2020 12:52:00 PM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R64203		Analyst: SS
Total Suspended Solids	7.00	5.00		mg/L	1	12/22/2020 1:41:06 PM

Work Order: 2012271
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: **MB-R64250**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **12/23/2020**		RunNo: **64250**			
Client ID: **MBLKW**	Batch ID: **R64250**					Analysis Date: **12/23/2020**		SeqNo: **1290915**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-R64250**	SampType: **LCS**			Units: **mg/L**		Prep Date: **12/23/2020**		RunNo: **64250**			
Client ID: **LCSW**	Batch ID: **R64250**					Analysis Date: **12/23/2020**		SeqNo: **1290916**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	102	2.50	100.0	0	102	99.6	108				

Sample ID: **2012270-001CDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/23/2020**		RunNo: **64250**			
Client ID: **BATCH**	Batch ID: **R64250**					Analysis Date: **12/23/2020**		SeqNo: **1290918**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	8.33	2.50						7.840	6.06	20	

Work Order: 2012271
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **MB-30795**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **12/21/2020**			RunNo: **64186**		
Client ID: **MBLKW**	Batch ID: **30795**					Analysis Date: **12/21/2020**			SeqNo: **1289751**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	ND	0.100									

Sample ID: **LCS-30795**	SampType: **LCS**			Units: **mg/L**		Prep Date: **12/21/2020**			RunNo: **64186**		
Client ID: **LCSW**	Batch ID: **30795**					Analysis Date: **12/21/2020**			SeqNo: **1289752**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	1.43	0.100	1.500	0	95.5	90	110				

Sample ID: **2012362-001BDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/21/2020**			RunNo: **64186**		
Client ID: **BATCH**	Batch ID: **30795**					Analysis Date: **12/21/2020**			SeqNo: **1289754**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	ND	0.100						0		20	

Sample ID: **2012362-001BMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **12/21/2020**			RunNo: **64186**		
Client ID: **BATCH**	Batch ID: **30795**					Analysis Date: **12/21/2020**			SeqNo: **1289755**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	1.43	0.100	1.500	0	95.3	80	120				

Sample ID: **2012362-001BMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **12/21/2020**			RunNo: **64186**		
Client ID: **BATCH**	Batch ID: **30795**					Analysis Date: **12/21/2020**			SeqNo: **1289756**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)+Nitrite (as N)	1.56	0.100	1.500	0	104	80	120	1.430	8.50	20	

Work Order: 2012271
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Suspended Solids (TSS) by SM 2540D

Sample ID: **MB-R64203**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **12/22/2020**			RunNo: **64203**		
Client ID: **MBLKW**	Batch ID: **R64203**					Analysis Date: **12/22/2020**			SeqNo: **1290134**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Suspended Solids	ND	5.00									

Sample ID: **LCS-R64203**	SampType: **LCS**			Units: **mg/L**		Prep Date: **12/22/2020**			RunNo: **64203**		
Client ID: **LCSW**	Batch ID: **R64203**					Analysis Date: **12/22/2020**			SeqNo: **1290135**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Suspended Solids	294	5.00	300.0	0	98.0	65	135				

Sample ID: **2012271-001DDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/22/2020**			RunNo: **64203**		
Client ID: **BMW-12**	Batch ID: **R64203**					Analysis Date: **12/22/2020**			SeqNo: **1290137**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Suspended Solids	6.00	5.00						5.000	18.2	30	

Sample ID: **2012292-001ADUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/22/2020**			RunNo: **64203**		
Client ID: **BATCH**	Batch ID: **R64203**					Analysis Date: **12/22/2020**			SeqNo: **1290148**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Suspended Solids	25.0	5.00						36.00	36.1	30	R

NOTES:
R - High RPD due to suspected sample inhomogeneity. The method is in control as indicated by the Laboratory Control Sample (LCS).

Work Order: 2012271
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-30794** SampType: **MBLK** Units: **µg/L** Prep Date: **12/21/2020** RunNo: **64253**
Client ID: **MBLKW** Batch ID: **30794** Analysis Date: **12/24/2020** SeqNo: **1291672**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	100									
Iron	ND	100									
Magnesium	ND	100									
Manganese	ND	2.00									
Potassium	ND	200									
Sodium	ND	100									

Sample ID: **LCS-30794** SampType: **LCS** Units: **µg/L** Prep Date: **12/21/2020** RunNo: **64253**
Client ID: **LCSW** Batch ID: **30794** Analysis Date: **12/24/2020** SeqNo: **1291673**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	992	100	1,000	0	99.2	50	150				
Iron	927	100	1,000	0	92.7	50	150				
Magnesium	1,020	100	1,000	0	102	50	150				
Manganese	103	2.00	100.0	0	103	85	115				
Potassium	914	200	1,000	0	91.4	50	150				
Sodium	1,020	100	1,000	0	102	50	150				

Sample ID: **2012271-001CDUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/21/2020** RunNo: **64253**
Client ID: **BMW-12** Batch ID: **30794** Analysis Date: **12/24/2020** SeqNo: **1291678**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	12,100	100						11,940	1.51	30	
Iron	ND	100						0		30	
Magnesium	9,930	100						9,384	5.61	30	
Manganese	ND	2.00						0		30	
Potassium	893	200						861.2	3.65	30	
Sodium	7,340	100						6,757	8.27	30	

Work Order: 2012271
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **2012271-001CMS** SampType: **MS** Units: **µg/L** Prep Date: **12/21/2020** RunNo: **64253**
Client ID: **BMW-12** Batch ID: **30794** Analysis Date: **12/24/2020** SeqNo: **1291679**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	17,300	100	5,000	11,940	107	50	150				
Iron	4,910	100	5,000	0	98.2	50	150				
Magnesium	15,100	100	5,000	9,384	115	70	130				
Manganese	535	2.00	500.0	0	107	70	130				
Potassium	5,810	200	5,000	861.2	99.0	50	150				
Sodium	12,300	100	5,000	6,757	110	50	150				

Sample ID: **2012271-001CMSD** SampType: **MSD** Units: **µg/L** Prep Date: **12/21/2020** RunNo: **64253**
Client ID: **BMW-12** Batch ID: **30794** Analysis Date: **12/24/2020** SeqNo: **1291680**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	16,600	100	5,000	11,940	92.3	50	150	17,270	4.26	30	
Iron	4,790	100	5,000	0	95.9	50	150	4,908	2.36	30	
Magnesium	14,200	100	5,000	9,384	97.3	70	130	15,140	6.05	30	
Manganese	516	2.00	500.0	0	103	70	130	535.3	3.65	30	
Potassium	5,530	200	5,000	861.2	93.4	50	150	5,811	4.93	30	
Sodium	11,700	100	5,000	6,757	98.7	50	150	12,270	4.80	30	

Sample ID: **MB-30793FB** SampType: **MBLK** Units: **µg/L** Prep Date: **12/21/2020** RunNo: **64253**
Client ID: **MBLKW** Batch ID: **30794** Analysis Date: **12/24/2020** SeqNo: **1291694**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	100									
Iron	ND	100									
Magnesium	ND	100									
Manganese	ND	2.00									
Potassium	ND	200									
Sodium	ND	100									

Work Order: 2012271
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-30793FB**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/21/2020**			RunNo: **64253**		
Client ID: **MBLKW**	Batch ID: **30794**					Analysis Date: **12/24/2020**			SeqNo: **1291694**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:
Filter Blank

Work Order: 2012271
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **MB-30797** SampType: **MBLK** Units: **µg/L** Prep Date: **12/22/2020** RunNo: **64206**
Client ID: **MBLKW** Batch ID: **30797** Analysis Date: **12/22/2020** SeqNo: **1290207**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	200									
Iron	ND	100									
Magnesium	ND	100									
Manganese	ND	5.00									
Potassium	ND	200									
Sodium	ND	200									

Sample ID: **LCS-30797** SampType: **LCS** Units: **µg/L** Prep Date: **12/22/2020** RunNo: **64206**
Client ID: **LCSW** Batch ID: **30797** Analysis Date: **12/22/2020** SeqNo: **1290208**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	1,020	200	1,000	0	102	50	150				
Iron	874	100	1,000	0	87.4	50	150				
Magnesium	1,070	100	1,000	0	107	50	150				
Manganese	101	5.00	100.0	0	101	85	115				
Potassium	1,030	200	1,000	0	103	50	150				
Sodium	1,050	200	1,000	0	105	50	150				

Sample ID: **2012271-001BDUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/22/2020** RunNo: **64206**
Client ID: **BMW-12** Batch ID: **30797** Analysis Date: **12/22/2020** SeqNo: **1290210**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	13,100	200						13,020	0.535	30	
Iron	ND	100						0		30	
Magnesium	10,700	100						10,730	0.540	30	
Manganese	ND	5.00						0		30	
Potassium	1,030	200						1,033	0.745	30	
Sodium	7,180	200						7,517	4.65	30	

Work Order: 2012271
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **2012271-001BMS** SampType: **MS** Units: **µg/L** Prep Date: **12/22/2020** RunNo: **64206**
Client ID: **BMW-12** Batch ID: **30797** Analysis Date: **12/22/2020** SeqNo: **1290211**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	17,200	200	5,000	13,020	82.8	50	150				
Iron	4,760	100	5,000	0	95.2	50	150				
Magnesium	15,800	100	5,000	10,730	101	70	130				
Manganese	496	5.00	500.0	0	99.2	70	130				
Potassium	6,230	200	5,000	1,033	104	50	150				
Sodium	11,900	200	5,000	7,517	87.2	50	150				

Sample ID: **2012271-001BMSD** SampType: **MSD** Units: **µg/L** Prep Date: **12/22/2020** RunNo: **64206**
Client ID: **BMW-12** Batch ID: **30797** Analysis Date: **12/22/2020** SeqNo: **1290212**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	16,900	200	5,000	13,020	77.4	50	150	17,160	1.57	30	
Iron	4,840	100	5,000	0	96.7	50	150	4,758	1.62	30	
Magnesium	15,700	100	5,000	10,730	98.8	70	130	15,800	0.843	30	
Manganese	480	5.00	500.0	0	96.1	70	130	496.2	3.25	30	
Potassium	6,210	200	5,000	1,033	104	50	150	6,228	0.269	30	
Sodium	12,300	200	5,000	7,517	96.2	50	150	11,880	3.69	30	

Work Order: 2012271
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **LCS-30768** SampType: **LCS** Units: **µg/L** Prep Date: **12/18/2020** RunNo: **64150**
Client ID: **LCSW** Batch ID: **30768** Analysis Date: **12/18/2020** SeqNo: **1289159**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	18.4	0.200	20.00	0	91.9	68.4	134				
1,1-Dichloroethane	21.1	1.00	20.00	0	105	80.8	120				
Surr: Dibromofluoromethane	25.2		25.00		101	87.8	114				
Surr: Toluene-d8	25.5		25.00		102	90.6	109				
Surr: 1-Bromo-4-fluorobenzene	26.1		25.00		105	88.6	111				

Sample ID: **MB-30768** SampType: **MBLK** Units: **µg/L** Prep Date: **12/18/2020** RunNo: **64150**
Client ID: **MBLKW** Batch ID: **30768** Analysis Date: **12/18/2020** SeqNo: **1289158**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.200									
1,1-Dichloroethane	ND	1.00									
Surr: Dibromofluoromethane	24.7		25.00		98.7	87.8	114				
Surr: Toluene-d8	25.3		25.00		101	90.6	109				
Surr: 1-Bromo-4-fluorobenzene	24.3		25.00		97.1	88.6	111				

Sample ID: **2012271-006ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/18/2020** RunNo: **64150**
Client ID: **BOW-37** Batch ID: **30768** Analysis Date: **12/18/2020** SeqNo: **1289150**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.200						0		30	
1,1-Dichloroethane	ND	1.00						0		30	
Surr: Dibromofluoromethane	25.2		25.00		101	87.8	114		0		
Surr: Toluene-d8	26.0		25.00		104	90.6	109		0		
Surr: 1-Bromo-4-fluorobenzene	24.1		25.00		96.4	88.6	111		0		

Work Order: 2012271
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **2012320-006DMS** SampType: **MS** Units: **µg/L** Prep Date: **12/18/2020** RunNo: **64150**
Client ID: **BATCH** Batch ID: **30768** Analysis Date: **12/19/2020** SeqNo: **1289155**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	19.3	0.200	20.00	0	96.4	64.1	148				
1,1-Dichloroethane	22.3	1.00	20.00	0	111	81.1	135				
Surr: Dibromofluoromethane	26.2		25.00		105	89.1	116				
Surr: Toluene-d8	26.7		25.00		107	90.5	111				
Surr: 1-Bromo-4-fluorobenzene	26.3		25.00		105	97.8	110				

Sample Log-In Check List

Client Name:	**COBI**	Work Order Number:	**2012271**
Logged by:	**Carissa True**	Date Received:	**12/16/2020 1:30:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes	☑	No ☐	Not Present	☐
2.	How was the sample delivered?	Picked up by FAI				

Log In

3.	Coolers are present?	Yes	☑	No ☐	NA	☐
4.	Shipping container/cooler in good condition?	Yes	☑	No ☐		
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes	☐	No ☐	Not Present	☑
6.	Was an attempt made to cool the samples?	Yes	☑	No ☐	NA	☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes	☑	No ☐	NA	☐
8.	Sample(s) in proper container(s)?	Yes	☑	No ☐		
9.	Sufficient sample volume for indicated test(s)?	Yes	☑	No ☐		
10.	Are samples properly preserved?	Yes	☑	No ☐		
11.	Was preservative added to bottles?	Yes	☐	No ☑	NA	☐
12.	Is there headspace in the VOA vials?	Yes	☐	No ☑	NA	☐
13.	Did all samples containers arrive in good condition(unbroken)?	Yes	☑	No ☐		
14.	Does paperwork match bottle labels?	Yes	☑	No ☐		
15.	Are matrices correctly identified on Chain of Custody?	Yes	☑	No ☐		
16.	Is it clear what analyses were requested?	Yes	☑	No ☐		
17.	Were all holding times able to be met?	Yes	☑	No ☐		

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes	☐	No ☐	NA	☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample 1	2.9

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Chain of Custody Record & Laboratory Services Agreement

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: Page: 1 of: 1

Laboratory Project No (internal): 2012271

Project Name: Vincent Landfill Groundwater

Special Remarks: VOCS: 1,1 - DCE, VC only.

Client: City of Bainbridge Island

Project No: 23320

Address: 7305 NE Hidden Cove Rd

Collected by: Ray Navarette

City, State, Zip: Bainbridge Island, WA 98110

Location: Vincent Landfill

Telephone: 206-780-3585

Report To (PM): Aaron Claiborne

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Fax: 206-780-5104

PM Email: Aclaiborne@bainbridgewa.gov

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	# of Cont.	VOCs (EPA 8260 / 624)	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8) Total (T)	Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1	BMW-12	12-16-20	6:45	GW	6	X								X		X		
2	BMW-13	12-16	7:50	GW	6	X								X		X		
3	BMW-14	12-16	8:46	GW	6	X								X		X		
4	BMW- 114	12-16	8:45	GW	6	X								X		X		
5	BMW-15	12-16	9:40	GW	8	X								X		X		Collect 2 additional VOAs
6	BOW-37	12-16	11:30	GW	6	X								X		X		
7																		
8																		
9																		
10																		

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite TSS Alkalinity

Turn-around Time: ☒ Standard ☐ Next Day ☐ 3 Day ☐ Same Day ☐ 2 Day ____ (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished (Signature)	Print Name	Date/Time	Received (Signature)	Print Name	Date/Time
x	Ray Navarette	12-16-20 1:00	x		12/16/2020 13:00
x		12/16/20 1530	x		12/16/20 1330

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Landfill Surfacewater
Work Order Number: 2012270

December 28, 2020

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 3 sample(s) on 12/16/2020 for the analyses presented in the following report.

Dissolved Metals by EPA Method 200.8
E.coli by m-ColiBlue24® (MF Count)
Fecal Coliform by SM 9222D
Total Metals by EPA Method 200.8
Total Alkalinity by SM 2320B

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *12/28/2020*

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater
Work Order: 2012270

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2012270-001	SWU-1	12/16/2020 10:25 AM	12/16/2020 1:31 PM
2012270-002	SWD-1	12/16/2020 11:00 AM	12/16/2020 1:31 PM
2012270-003	SWD-11 (DUP)	12/16/2020 11:00 AM	12/16/2020 1:31 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2012270**
Date: **12/28/2020**

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

For fecal coliform, samples were added to the incubator at a temperature out of the required range, 43.5 C vs 44.5 C +/- 0.2. Samples were taken out outside of the range as well, 45.0 C vs 44.5 C +/- 0.2

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2012270**
Date Reported: **12/28/2020**

Client: City of Bainbridge Island
Collection Date: 12/16/2020 10:25:00 AM
Project: Vincent Landfill Surfacewater
Lab ID: 2012270-001
Matrix: Stormwater
Client Sample ID: SWU-1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Fecal Coliform by SM 9222D				Batch ID: R64101		Analyst: TN
Coliform, Fecal	90.0	10.0	D	CFU/100ml	10	12/16/2020 4:31:00 PM
E.coli by m-ColiBlue24® (MF Count)				Batch ID: R64100		Analyst: TN
E. coli	200	100	D	CFU/100ml	100	12/16/2020 4:31:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 30794		Analyst: CO
Copper	3.41	1.00		µg/L	1	12/24/2020 6:47:06 PM
Iron	723	100		µg/L	1	12/24/2020 6:47:06 PM
Lead	0.731	0.500		µg/L	1	12/24/2020 6:47:06 PM
Zinc	3.49	2.50		µg/L	1	12/24/2020 6:47:06 PM
Total Metals by EPA Method 200.8				Batch ID: 30779		Analyst: CO
Copper	ND	2.00		µg/L	1	12/21/2020 2:59:28 PM
Iron	649	100		µg/L	1	12/21/2020 2:59:28 PM
Lead	1.13	0.500		µg/L	1	12/21/2020 2:59:28 PM
Zinc	2.62	2.50		µg/L	1	12/21/2020 2:59:28 PM
Total Alkalinity by SM 2320B				Batch ID: R64250		Analyst: TN
Alkalinity, Total (As CaCO3)	7.84	2.50		mg/L	1	12/23/2020 12:52:00 PM

Analytical Report

Work Order: **2012270**
Date Reported: **12/28/2020**

Client: City of Bainbridge Island
Project: Vincent Landfill Surfacewater
Lab ID: 2012270-002
Client Sample ID: **SWD-1**

Collection Date: 12/16/2020 11:00:00 AM
Matrix: Stormwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Fecal Coliform by SM 9222D				Batch ID: R64101		Analyst: TN
Coliform, Fecal	990	10.0	D	CFU/100ml	10	12/16/2020 4:31:00 PM
E.coli by m-ColiBlue24® (MF Count)				Batch ID: R64100		Analyst: TN
E. coli	300	100	D	CFU/100ml	100	12/16/2020 4:31:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 30794		Analyst: CO
Copper	6.44	1.00		µg/L	1	12/24/2020 6:52:40 PM
Iron	538	100		µg/L	1	12/24/2020 6:52:40 PM
Lead	0.608	0.500		µg/L	1	12/24/2020 6:52:40 PM
Zinc	9.42	2.50		µg/L	1	12/24/2020 6:52:40 PM
Total Metals by EPA Method 200.8				Batch ID: 30779		Analyst: CO
Copper	7.50	2.00		µg/L	1	12/21/2020 3:05:02 PM
Iron	859	100		µg/L	1	12/21/2020 3:05:02 PM
Lead	1.22	0.500		µg/L	1	12/21/2020 3:05:02 PM
Zinc	13.3	2.50		µg/L	1	12/21/2020 3:05:02 PM
Total Alkalinity by SM 2320B				Batch ID: R64250		Analyst: TN
Alkalinity, Total (As CaCO3)	15.2	2.50		mg/L	1	12/23/2020 12:52:00 PM

Analytical Report

Work Order: **2012270**
Date Reported: **12/28/2020**

Client: City of Bainbridge Island
Collection Date: 12/16/2020 11:00:00 AM
Project: Vincent Landfill Surfacewater
Lab ID: 2012270-003
Matrix: Stormwater
Client Sample ID: SWD-11 (DUP)

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Fecal Coliform by SM 9222D				Batch ID: R64101		Analyst: TN
Coliform, Fecal	1,060	10.0	D	CFU/100ml	10	12/16/2020 4:31:00 PM
E.coli by m-ColiBlue24® (MF Count)				Batch ID: R64100		Analyst: TN
E. coli	>2,000	10.0	DTNTC	CFU/100ml	10	12/16/2020 4:31:00 PM
NOTES: TNTC - Too numerous to count						
Dissolved Metals by EPA Method 200.8				Batch ID: 30794		Analyst: CO
Copper	5.56	1.00		µg/L	1	12/24/2020 6:58:13 PM
Iron	440	100		µg/L	1	12/24/2020 6:58:13 PM
Lead	ND	0.500		µg/L	1	12/24/2020 6:58:13 PM
Zinc	7.92	2.50		µg/L	1	12/24/2020 6:58:13 PM
Total Metals by EPA Method 200.8				Batch ID: 30779		Analyst: CO
Copper	7.18	2.00		µg/L	1	12/21/2020 3:10:36 PM
Iron	789	100		µg/L	1	12/21/2020 3:10:36 PM
Lead	1.15	0.500		µg/L	1	12/21/2020 3:10:36 PM
Zinc	11.7	2.50		µg/L	1	12/21/2020 3:10:36 PM
Total Alkalinity by SM 2320B				Batch ID: R64250		Analyst: TN
Alkalinity, Total (As CaCO3)	16.2	2.50		mg/L	1	12/23/2020 12:52:00 PM

Work Order: 2012270
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Fecal Coliform by SM 9222D

Sample ID: **MB-R64101** SampType: **MBLK** Units: **CFU/100ml** Prep Date: **12/16/2020** RunNo: **64101**
Client ID: **MBLKW** Batch ID: **R64101** Analysis Date: **12/16/2020** SeqNo: **1288511**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Coliform, Fecal	ND	1.00									

Sample ID: **MB-R64101** SampType: **MBLK** Units: **CFU/100ml** Prep Date: **12/16/2020** RunNo: **64101**
Client ID: **MBLKW** Batch ID: **R64101** Analysis Date: **12/16/2020** SeqNo: **1288515**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Coliform, Fecal	ND	1.00									

Sample ID: **MB-R64101** SampType: **MBLK** Units: **CFU/100ml** Prep Date: **12/16/2020** RunNo: **64101**
Client ID: **MBLKW** Batch ID: **R64101** Analysis Date: **12/16/2020** SeqNo: **1288517**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Coliform, Fecal	ND	1.00									

Work Order: 2012270
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

E.coli by m-ColiBlue24® (MF Count)

Sample ID: **MB-R64100** SampType: **MBLK** Units: **CFU/100ml** Prep Date: **12/16/2020** RunNo: **64100**
Client ID: **MBLKW** Batch ID: **R64100** Analysis Date: **12/16/2020** SeqNo: **1288504**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
E. coli	ND	1.00									

Sample ID: **MB2-R64100** SampType: **MBLK** Units: **CFU/100ml** Prep Date: **12/16/2020** RunNo: **64100**
Client ID: **MBLKW** Batch ID: **R64100** Analysis Date: **12/16/2020** SeqNo: **1288508**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
E. coli	ND	1.00									

Sample ID: **MB3-R64100** SampType: **MBLK** Units: **CFU/100ml** Prep Date: **12/16/2020** RunNo: **64100**
Client ID: **MBLKW** Batch ID: **R64100** Analysis Date: **12/16/2020** SeqNo: **1288510**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
E. coli	ND	1.00									

Work Order: 2012270
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: **MB-R64250**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **12/23/2020**			RunNo: **64250**		
Client ID: **MBLKW**	Batch ID: **R64250**					Analysis Date: **12/23/2020**			SeqNo: **1290915**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-R64250**	SampType: **LCS**			Units: **mg/L**		Prep Date: **12/23/2020**			RunNo: **64250**		
Client ID: **LCSW**	Batch ID: **R64250**					Analysis Date: **12/23/2020**			SeqNo: **1290916**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	102	2.50	100.0	0	102	99.6	108				

Sample ID: **2012270-001CDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/23/2020**			RunNo: **64250**		
Client ID: **SWU-1**	Batch ID: **R64250**					Analysis Date: **12/23/2020**			SeqNo: **1290918**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	8.33	2.50						7.840	6.06	20	

Work Order: 2012270
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-30794**	SampType: **MBLK**	Units: **µg/L**	Prep Date: **12/21/2020**	RunNo: **64253**
Client ID: **MBLKW**	Batch ID: **30794**		Analysis Date: **12/24/2020**	SeqNo: **1291672**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	4.06	1.00									
Iron	ND	100									
Lead	ND	0.500									
Zinc	ND	2.50									

Sample ID: **LCS-30794**	SampType: **LCS**	Units: **µg/L**	Prep Date: **12/21/2020**	RunNo: **64253**
Client ID: **LCSW**	Batch ID: **30794**		Analysis Date: **12/24/2020**	SeqNo: **1291673**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	96.2	1.00	100.0	0	96.2	85	115				B
Iron	927	100	1,000	0	92.7	50	150				
Lead	51.7	0.500	50.00	0	103	85	115				
Zinc	107	2.50	100.0	0	107	85	115				

Sample ID: **2012271-001CDUP**	SampType: **DUP**	Units: **µg/L**	Prep Date: **12/21/2020**	RunNo: **64253**
Client ID: **BATCH**	Batch ID: **30794**		Analysis Date: **12/24/2020**	SeqNo: **1291678**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	2.79	1.00						0.7440	116	30	BR
Iron	ND	100						0		30	
Lead	ND	0.500						0		30	
Zinc	ND	2.50						0		30	

NOTES:
R - High RPD observed. The method is in control as indicated by the LCS.

Sample ID: **2012271-001CMS**	SampType: **MS**	Units: **µg/L**	Prep Date: **12/21/2020**	RunNo: **64253**
Client ID: **BATCH**	Batch ID: **30794**		Analysis Date: **12/24/2020**	SeqNo: **1291679**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	520	1.00	500.0	0.7440	104	70	130				B

Work Order: 2012270
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **2012271-001CMS** SampType: **MS** Units: **µg/L** Prep Date: **12/21/2020** RunNo: **64253**
Client ID: **BATCH** Batch ID: **30794** Analysis Date: **12/24/2020** SeqNo: **1291679**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	4,910	100	5,000	0	98.2	50	150				
Lead	268	0.500	250.0	0	107	70	130				
Zinc	575	2.50	500.0	0.8210	115	70	130				

Sample ID: **2012271-001CMSD** SampType: **MSD** Units: **µg/L** Prep Date: **12/21/2020** RunNo: **64253**
Client ID: **BATCH** Batch ID: **30794** Analysis Date: **12/24/2020** SeqNo: **1291680**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	508	1.00	500.0	0.7440	101	70	130	519.7	2.28	30	B
Iron	4,790	100	5,000	0	95.9	50	150	4,908	2.36	30	
Lead	267	0.500	250.0	0	107	70	130	268.3	0.564	30	
Zinc	558	2.50	500.0	0.8210	111	70	130	575.2	3.00	30	

Sample ID: **MB-30793FB** SampType: **MBLK** Units: **µg/L** Prep Date: **12/21/2020** RunNo: **64253**
Client ID: **MBLKW** Batch ID: **30794** Analysis Date: **12/24/2020** SeqNo: **1291694**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	1.00									
Iron	ND	100									
Lead	ND	0.500									
Zinc	ND	2.50									

NOTES:
Filter Blank

Work Order: 2012270
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **MB-30779**	SampType: **MBLK**	Units: **µg/L**	Prep Date: **12/21/2020**	RunNo: **64170**
Client ID: **MBLKW**	Batch ID: **30779**		Analysis Date: **12/21/2020**	SeqNo: **1289504**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	2.00									
Iron	ND	100									
Lead	ND	1.00									
Zinc	ND	2.50									

Sample ID: **LCS-30779**	SampType: **LCS**	Units: **µg/L**	Prep Date: **12/21/2020**	RunNo: **64170**
Client ID: **LCSW**	Batch ID: **30779**		Analysis Date: **12/21/2020**	SeqNo: **1289505**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	106	2.00	100.0	0	106	85	115				
Iron	966	100	1,000	0	96.6	50	150				
Lead	49.7	1.00	50.00	0	99.5	85	115				
Zinc	104	2.50	100.0	0	104	85	115				

Sample ID: **2012282-004ADUP**	SampType: **DUP**	Units: **µg/L**	Prep Date: **12/21/2020**	RunNo: **64170**
Client ID: **BATCH**	Batch ID: **30779**		Analysis Date: **12/21/2020**	SeqNo: **1289507**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	2.10	2.00						2.216	5.35	30	
Iron	ND	100						0		30	
Lead	ND	1.00						0		30	
Zinc	2.58	2.50						1.618	45.7	30	

Sample ID: **2012282-004AMS**	SampType: **MS**	Units: **µg/L**	Prep Date: **12/21/2020**	RunNo: **64170**
Client ID: **BATCH**	Batch ID: **30779**		Analysis Date: **12/21/2020**	SeqNo: **1289508**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	513	2.00	500.0	2.216	102	70	130				
Iron	4,900	100	5,000	57.38	96.9	50	150				

Work Order: 2012270
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **2012282-004AMS** SampType: **MS** Units: **µg/L** Prep Date: **12/21/2020** RunNo: **64170**
Client ID: **BATCH** Batch ID: **30779** Analysis Date: **12/21/2020** SeqNo: **1289508**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	238	1.00	250.0	0	95.0	70	130				
Zinc	516	2.50	500.0	1.618	103	70	130				

Sample ID: **2012282-004AMSD** SampType: **MSD** Units: **µg/L** Prep Date: **12/21/2020** RunNo: **64170**
Client ID: **BATCH** Batch ID: **30779** Analysis Date: **12/21/2020** SeqNo: **1289509**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	506	2.00	500.0	2.216	101	70	130	513.2	1.49	30	
Iron	4,840	100	5,000	57.38	95.7	50	150	4,903	1.28	30	
Lead	235	1.00	250.0	0	94.0	70	130	237.5	1.02	30	
Zinc	500	2.50	500.0	1.618	99.6	70	130	516.4	3.31	30	

Sample Log-In Check List

Client Name:	**COBI**	Work Order Number:	**2012270**
Logged by:	**Carissa True**	Date Received:	**12/16/2020 1:31:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes	☑	No	☐	Not Present ☐
2.	How was the sample delivered?	Picked up by FAI				

Log In

3.	Coolers are present?	Yes	☑	No	☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes	☑	No	☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes	☐	No	☐	Not Present ☑
6.	Was an attempt made to cool the samples?	Yes	☑	No	☐	NA ☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes	☑	No	☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes	☑	No	☐	
9.	Sufficient sample volume for indicated test(s)?	Yes	☑	No	☐	
10.	Are samples properly preserved?	Yes	☑	No	☐	
11.	Was preservative added to bottles?	Yes	☐	No	☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes	☐	No	☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes	☑	No	☐	
14.	Does paperwork match bottle labels?	Yes	☑	No	☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes	☑	No	☐	
16.	Is it clear what analyses were requested?	Yes	☑	No	☐	
17.	Were all holding times able to be met?	Yes	☑	No	☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes	☐	No	☐	NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample	2.9

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Chain of Custody Record & Laboratory Services Agreement

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: | Page: 1 of: 1 | Laboratory Project No (internal): 2012270

Project Name: Vincent Landfill Surfacewater | Special Remarks:

Project No: 23320

Client: City of Bainbridge Island

Collected by: Ray Navarette

Address: 7305 NE Hidden Cove Rd

Location: Vincent Landfill

City, State, Zip: Bainbridge Island, WA 98110

Report To (PM): Aaron Claiborne | Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Telephone: 206-780-3585

Fax: 206-780-5104

PM Email: Aclaiborne@bainbridgewa.gov

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	# of Cont.	VOCs (EPA 8260 / 624)	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8) Total (T) Dissolved (D)	Anions (IC)***	EDB (8011)	Alkalinity	e.coli	fecal	Comments
1 SWU-1	12/16/20	10:25	SW	5								X			X	X	X		unfiltered grab sample
2 SWD-1	12-16	11:00	SW	5								X			X	X	X		" " "
3 SWD-11 (Dup)	12-16	11:00	SW	5								X			X	X	X		" " "
4																			
5																			
6																			
7																			
8																			
9																			
10																			

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:
☒ Standard ☐ Next Day
☐ 3 Day ☐ Same Day
☐ 2 Day ☐ (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished (Signature)	Print Name	Date/Time	Received (Signature)	Print Name	Date/Time
x	Ray Navarette	12/16/20 1:00	x		12/16/20 13:00
x		12/16/20 13:31	x	C. Anderson	12/16/20 1331

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Landfill Groundwater
Work Order Number: 2106304

June 28, 2021

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 7 sample(s) on 6/16/2021 for the analyses presented in the following report.

Dissolved Metals by EPA Method 200.8
Ion Chromatography by EPA Method 300.0
Total Metals by EPA Method 200.8
Total Alkalinity by SM 2320B
Total Suspended Solids (TSS) by SM 2540D
Volatile Organic Compounds by EPA Method 8260D SIM

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.3 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910

Date: *06/28/2021*

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Work Order: 2106304

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2106304-001	BMW-12	06/16/2021 6:35 AM	06/16/2021 12:45 PM
2106304-002	BMW-13	06/16/2021 7:40 AM	06/16/2021 12:45 PM
2106304-003	BMW-14	06/16/2021 8:35 AM	06/16/2021 12:45 PM
2106304-004	BMW-114	06/16/2021 8:35 AM	06/16/2021 12:45 PM
2106304-005	BMW-15	06/16/2021 9:35 AM	06/16/2021 12:45 PM
2106304-006	BOW-37	06/16/2021 10:25 AM	06/16/2021 12:45 PM
2106304-007	Trip Blank	06/02/2021 11:48 AM	06/16/2021 12:45 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2106304**
Date: **6/28/2021**

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Client: City of Bainbridge Island **Collection Date:** 6/16/2021 6:35:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2106304-001 **Matrix:** Groundwater
Client Sample ID: BMW-12

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 32699		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	6/18/2021 2:54:36 PM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/18/2021 2:54:36 PM
Surr: Dibromofluoromethane	104	80 - 120		%Rec	1	6/18/2021 2:54:36 PM
Surr: Toluene-d8	100	80 - 120		%Rec	1	6/18/2021 2:54:36 PM
Surr: 1-Bromo-4-fluorobenzene	92.1	80 - 120		%Rec	1	6/18/2021 2:54:36 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 32698		Analyst: SS
Chloride	5.18	0.200	D	mg/L	2	6/18/2021 8:19:00 PM
Nitrite (as N)	ND	0.100	Q*	mg/L	1	6/17/2021 6:07:00 PM
Nitrite (as N)	ND	0.100	H	mg/L	1	6/18/2021 6:47:00 PM
Nitrate (as N)	1.09	0.100	Q	mg/L	1	6/17/2021 6:07:00 PM
Nitrate (as N)	1.22	0.100	H	mg/L	1	6/18/2021 6:47:00 PM
Sulfate	7.84	0.600		mg/L	1	6/18/2021 6:47:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 32701		Analyst: EH
Calcium	11,700	525		µg/L	1	6/25/2021 2:27:21 PM
Iron	ND	100		µg/L	1	6/23/2021 12:51:00 AM
Magnesium	9,650	100		µg/L	1	6/23/2021 12:51:00 AM
Manganese	ND	1.80		µg/L	1	6/23/2021 12:51:00 AM
Potassium	907	200		µg/L	1	6/25/2021 2:27:21 PM
Sodium	6,410	250		µg/L	1	6/25/2021 2:27:21 PM
Total Metals by EPA Method 200.8				Batch ID: 32702		Analyst: EH
Manganese	ND	5.00		µg/L	1	6/21/2021 10:37:03 PM
Total Alkalinity by SM 2320B				Batch ID: R68246		Analyst: TN
Alkalinity, Bicarbonate (As CaCO3)	52.3	2.50		mg/L	1	6/28/2021 10:41:39 AM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	6/28/2021 10:41:39 AM
Alkalinity, Total (As CaCO3)	52.3	2.50		mg/L	1	6/28/2021 10:41:39 AM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria
* - Flagged value is not within established control limits.

Analytical Report

Work Order: **2106304**
Date Reported: **6/28/2021**

Client: City of Bainbridge Island
Collection Date: 6/16/2021 6:35:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2106304-001
Matrix: Groundwater
Client Sample ID: BMW-12

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R68113		Analyst: SS
Total Suspended Solids	ND	3.00		mg/L	1	6/22/2021 1:42:42 PM

Client: City of Bainbridge Island **Collection Date:** 6/16/2021 7:40:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2106304-002 **Matrix:** Groundwater
Client Sample ID: BMW-13

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 32699		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	6/18/2021 4:01:34 PM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/18/2021 4:01:34 PM
Surr: Dibromofluoromethane	105	80 - 120		%Rec	1	6/18/2021 4:01:34 PM
Surr: Toluene-d8	99.2	80 - 120		%Rec	1	6/18/2021 4:01:34 PM
Surr: 1-Bromo-4-fluorobenzene	93.2	80 - 120		%Rec	1	6/18/2021 4:01:34 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 32698		Analyst: SS
Chloride	8.94	1.00	D	mg/L	10	6/18/2021 9:05:00 PM
Nitrite (as N)	ND	0.100	H	mg/L	1	6/18/2021 8:42:00 PM
Nitrite (as N)	ND	0.100	Q*	mg/L	1	6/17/2021 7:39:00 PM
Nitrate (as N)	0.357	0.100	H	mg/L	1	6/18/2021 8:42:00 PM
Nitrate (as N)	0.318	0.100	Q	mg/L	1	6/17/2021 7:39:00 PM
Sulfate	50.4	6.00	D	mg/L	10	6/18/2021 9:05:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 32701		Analyst: EH
Calcium	96,400	2,620	D	µg/L	5	6/25/2021 2:32:55 PM
Iron	ND	100		µg/L	1	6/23/2021 12:56:33 AM
Magnesium	82,700	500	D	µg/L	5	6/24/2021 12:14:57 AM
Manganese	5,620	9.00	D	µg/L	5	6/25/2021 2:32:55 PM
Potassium	2,380	1,000	D	µg/L	5	6/25/2021 2:32:55 PM
Sodium	18,600	1,250	D	µg/L	5	6/25/2021 2:32:55 PM
Total Metals by EPA Method 200.8				Batch ID: 32702		Analyst: EH
Manganese	6,390	50.0	D	µg/L	10	6/25/2021 12:31:31 AM
Total Alkalinity by SM 2320B				Batch ID: R68246		Analyst: TN
Alkalinity, Bicarbonate (As CaCO3)	516	2.50		mg/L	1	6/28/2021 10:41:39 AM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	6/28/2021 10:41:39 AM
Alkalinity, Total (As CaCO3)	516	2.50		mg/L	1	6/28/2021 10:41:39 AM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria
* - Flagged value is not within established control limits.

Analytical Report

Work Order: **2106304**
Date Reported: **6/28/2021**

Client: City of Bainbridge Island
Collection Date: 6/16/2021 7:40:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2106304-002
Matrix: Groundwater
Client Sample ID: BMW-13

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R68113		Analyst: SS
Total Suspended Solids	ND	3.00		mg/L	1	6/22/2021 1:42:42 PM

Client: City of Bainbridge Island **Collection Date:** 6/16/2021 8:35:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2106304-003 **Matrix:** Groundwater
Client Sample ID: BMW-14

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 32699		Analyst: CR
Vinyl chloride	0.142	0.0100		µg/L	1	6/18/2021 4:35:04 PM
1,1-Dichloroethene	0.0218	0.0100		µg/L	1	6/18/2021 4:35:04 PM
Surr: Dibromofluoromethane	99.6	80 - 120		%Rec	1	6/18/2021 4:35:04 PM
Surr: Toluene-d8	99.0	80 - 120		%Rec	1	6/18/2021 4:35:04 PM
Surr: 1-Bromo-4-fluorobenzene	92.3	80 - 120		%Rec	1	6/18/2021 4:35:04 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 32698		Analyst: SS
Chloride	8.17	0.500	D	mg/L	5	6/21/2021 10:14:00 AM
Nitrite (as N)	ND	0.100	H	mg/L	1	6/21/2021 9:51:00 AM
Nitrite (as N)	ND	0.100	Q*	mg/L	1	6/17/2021 8:02:00 PM
Nitrate (as N)	0.141	0.100	H	mg/L	1	6/21/2021 9:51:00 AM
Nitrate (as N)	ND	0.100	Q	mg/L	1	6/17/2021 8:02:00 PM
Sulfate	23.3	3.00	D	mg/L	5	6/21/2021 10:14:00 AM
Dissolved Metals by EPA Method 200.8				Batch ID: 32701		Analyst: EH
Calcium	53,300	2,620	D	µg/L	5	6/25/2021 2:38:29 PM
Iron	ND	100		µg/L	1	6/23/2021 1:13:16 AM
Magnesium	46,900	500	D	µg/L	5	6/24/2021 12:20:31 AM
Manganese	37.7	9.00	D	µg/L	5	6/25/2021 2:38:29 PM
Potassium	2,690	1,000	D	µg/L	5	6/25/2021 2:38:29 PM
Sodium	26,300	1,250	D	µg/L	5	6/25/2021 2:38:29 PM
Total Metals by EPA Method 200.8				Batch ID: 32702		Analyst: EH
Manganese	33.8	5.00		µg/L	1	6/25/2021 12:37:05 AM
Total Alkalinity by SM 2320B				Batch ID: R68246		Analyst: TN
Alkalinity, Bicarbonate (As CaCO3)	311	2.50		mg/L	1	6/28/2021 10:41:39 AM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	6/28/2021 10:41:39 AM
Alkalinity, Total (As CaCO3)	311	2.50		mg/L	1	6/28/2021 10:41:39 AM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria
* - Flagged value is not within established control limits.

Analytical Report

Work Order: **2106304**
Date Reported: **6/28/2021**

Client: City of Bainbridge Island
Collection Date: 6/16/2021 8:35:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2106304-003
Matrix: Groundwater
Client Sample ID: BMW-14

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R68113		Analyst: SS
Total Suspended Solids	ND	3.00		mg/L	1	6/22/2021 1:42:42 PM

Analytical Report

Work Order: **2106304**
Date Reported: **6/28/2021**

Client: City of Bainbridge Island
Collection Date: 6/16/2021 8:35:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2106304-004
Matrix: Groundwater
Client Sample ID: BMW-114

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 32699		Analyst: CR
Vinyl chloride	0.141	0.0100		µg/L	1	6/18/2021 5:08:34 PM
1,1-Dichloroethene	0.0214	0.0100		µg/L	1	6/18/2021 5:08:34 PM
Surr: Dibromofluoromethane	100	80 - 120		%Rec	1	6/18/2021 5:08:34 PM
Surr: Toluene-d8	98.6	80 - 120		%Rec	1	6/18/2021 5:08:34 PM
Surr: 1-Bromo-4-fluorobenzene	92.1	80 - 120		%Rec	1	6/18/2021 5:08:34 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 32698		Analyst: SS
Chloride	8.14	0.500	D	mg/L	5	6/21/2021 11:00:00 AM
Nitrite (as N)	ND	0.100	H	mg/L	1	6/21/2021 10:37:00 AM
Nitrite (as N)	ND	0.100	Q*	mg/L	1	6/17/2021 8:25:00 PM
Nitrate (as N)	0.133	0.100	H	mg/L	1	6/21/2021 10:37:00 AM
Nitrate (as N)	ND	0.100	Q	mg/L	1	6/17/2021 8:25:00 PM
Sulfate	23.5	3.00	D	mg/L	5	6/21/2021 11:00:00 AM
Dissolved Metals by EPA Method 200.8				Batch ID: 32701		Analyst: EH
Calcium	50,900	2,620	D	µg/L	5	6/25/2021 2:44:03 PM
Iron	ND	100		µg/L	1	6/23/2021 1:18:50 AM
Magnesium	49,900	500	D	µg/L	5	6/25/2021 2:44:03 PM
Manganese	37.3	9.00	D	µg/L	5	6/25/2021 2:44:03 PM
Potassium	2,540	1,000	D	µg/L	5	6/25/2021 2:44:03 PM
Sodium	26,000	1,250	D	µg/L	5	6/25/2021 2:44:03 PM
Total Metals by EPA Method 200.8				Batch ID: 32702		Analyst: EH
Manganese	34.0	5.00		µg/L	1	6/25/2021 12:42:39 AM
Total Alkalinity by SM 2320B				Batch ID: R68246		Analyst: TN
Alkalinity, Bicarbonate (As CaCO3)	310	2.50		mg/L	1	6/28/2021 10:41:39 AM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	6/28/2021 10:41:39 AM
Alkalinity, Total (As CaCO3)	310	2.50		mg/L	1	6/28/2021 10:41:39 AM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria
* - Flagged value is not within established control limits.

Analytical Report

Work Order: **2106304**
Date Reported: **6/28/2021**

Client: City of Bainbridge Island
Collection Date: 6/16/2021 8:35:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2106304-004
Matrix: Groundwater
Client Sample ID: **BMW-114**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R68113		Analyst: SS
Total Suspended Solids	ND	3.00		mg/L	1	6/22/2021 1:42:42 PM

Analytical Report

Work Order: **2106304**
Date Reported: **6/28/2021**

Client: City of Bainbridge Island
Collection Date: 6/16/2021 9:35:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2106304-005
Matrix: Groundwater
Client Sample ID: BMW-15

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 32699		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	6/18/2021 5:42:03 PM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/18/2021 5:42:03 PM
Surr: Dibromofluoromethane	102	80 - 120		%Rec	1	6/18/2021 5:42:03 PM
Surr: Toluene-d8	101	80 - 120		%Rec	1	6/18/2021 5:42:03 PM
Surr: 1-Bromo-4-fluorobenzene	91.1	80 - 120		%Rec	1	6/18/2021 5:42:03 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 32698		Analyst: SS
Chloride	24.5	1.00	D	mg/L	10	6/21/2021 11:47:00 AM
Nitrite (as N)	ND	0.100	H	mg/L	1	6/21/2021 11:24:00 AM
Nitrite (as N)	ND	0.100	Q*	mg/L	1	6/17/2021 8:48:00 PM
Nitrate (as N)	3.41	1.00	DH	mg/L	10	6/21/2021 11:47:00 AM
Nitrate (as N)	3.38	0.100	EQ	mg/L	1	6/17/2021 8:48:00 PM
Sulfate	54.0	6.00	D	mg/L	10	6/21/2021 11:47:00 AM
Dissolved Metals by EPA Method 200.8				Batch ID: 32701		Analyst: EH
Calcium	49,000	2,620	D	µg/L	5	6/25/2021 2:49:37 PM
Iron	ND	100		µg/L	1	6/23/2021 1:24:23 AM
Magnesium	37,300	500	D	µg/L	5	6/25/2021 2:49:37 PM
Manganese	ND	1.80		µg/L	1	6/23/2021 1:24:23 AM
Potassium	2,640	1,000	D	µg/L	5	6/25/2021 2:49:37 PM
Sodium	47,400	1,250	D	µg/L	5	6/25/2021 2:49:37 PM
Total Metals by EPA Method 200.8				Batch ID: 32702		Analyst: EH
Manganese	ND	5.00		µg/L	1	6/21/2021 10:55:19 PM
Total Alkalinity by SM 2320B				Batch ID: R68246		Analyst: TN
Alkalinity, Bicarbonate (As CaCO3)	245	2.50		mg/L	1	6/28/2021 10:41:39 AM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	6/28/2021 10:41:39 AM
Alkalinity, Total (As CaCO3)	245	2.50		mg/L	1	6/28/2021 10:41:39 AM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria
* - Flagged value is not within established control limits.

Analytical Report

Work Order: **2106304**
Date Reported: **6/28/2021**

Client: City of Bainbridge Island
Collection Date: 6/16/2021 9:35:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2106304-005
Matrix: Groundwater
Client Sample ID: BMW-15

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R68113		Analyst: SS
Total Suspended Solids	ND	3.00		mg/L	1	6/22/2021 1:42:42 PM

Client: City of Bainbridge Island **Collection Date:** 6/16/2021 10:25:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2106304-006 **Matrix:** Groundwater
Client Sample ID: BOW-37

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 32699		Analyst: CR
Vinyl chloride	ND	0.0100		µg/L	1	6/18/2021 6:15:30 PM
1,1-Dichloroethene	ND	0.0100		µg/L	1	6/18/2021 6:15:30 PM
Surr: Dibromofluoromethane	101	80 - 120		%Rec	1	6/18/2021 6:15:30 PM
Surr: Toluene-d8	102	80 - 120		%Rec	1	6/18/2021 6:15:30 PM
Surr: 1-Bromo-4-fluorobenzene	91.3	80 - 120		%Rec	1	6/18/2021 6:15:30 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 32698		Analyst: SS
Chloride	5.63	1.00	D	mg/L	10	6/21/2021 12:33:00 PM
Nitrite (as N)	ND	0.100	H	mg/L	1	6/21/2021 12:10:00 PM
Nitrite (as N)	ND	0.100	Q*	mg/L	1	6/17/2021 9:12:00 PM
Nitrate (as N)	1.26	0.100	H	mg/L	1	6/21/2021 12:10:00 PM
Nitrate (as N)	0.963	0.100	Q	mg/L	1	6/17/2021 9:12:00 PM
Sulfate	8.37	0.600		mg/L	1	6/21/2021 12:10:00 PM

NOTES:
S - Outlying spike recovery observed (low bias). Samples will be qualified with a *.
* - Flagged value is not within established control limits.

Dissolved Metals by EPA Method 200.8				Batch ID: 32701		Analyst: EH
Calcium	21,400	525		µg/L	1	6/25/2021 2:55:11 PM
Iron	ND	100		µg/L	1	6/23/2021 1:29:57 AM
Magnesium	19,000	100		µg/L	1	6/23/2021 1:29:57 AM
Manganese	1.90	1.80		µg/L	1	6/25/2021 2:55:11 PM
Potassium	1,900	200		µg/L	1	6/25/2021 2:55:11 PM
Sodium	15,500	250		µg/L	1	6/25/2021 2:55:11 PM
Total Metals by EPA Method 200.8				Batch ID: 32702		Analyst: EH
Manganese	ND	5.00		µg/L	1	6/21/2021 10:59:53 PM
Total Alkalinity by SM 2320B				Batch ID: R68246		Analyst: TN
Alkalinity, Bicarbonate (As CaCO3)	120	2.50		mg/L	1	6/28/2021 10:41:39 AM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	6/28/2021 10:41:39 AM
Alkalinity, Total (As CaCO3)	120	2.50		mg/L	1	6/28/2021 10:41:39 AM

Analytical Report

Work Order: **2106304**
Date Reported: **6/28/2021**

Client: City of Bainbridge Island
Collection Date: 6/16/2021 10:25:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2106304-006
Matrix: Groundwater
Client Sample ID: BOW-37

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R68113		Analyst: SS
Total Suspended Solids	ND	3.00		mg/L	1	6/22/2021 1:42:42 PM

Work Order: 2106304
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: **MB-R68246**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **6/28/2021**			RunNo: **68246**		
Client ID: **MBLKW**	Batch ID: **R68246**					Analysis Date: **6/28/2021**			SeqNo: **1378089**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-R68246**	SampType: **LCS**			Units: **mg/L**		Prep Date: **6/28/2021**			RunNo: **68246**		
Client ID: **LCSW**	Batch ID: **R68246**					Analysis Date: **6/28/2021**			SeqNo: **1378090**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	91.0	2.50	100.0	0	91.0	90.5	114				

Sample ID: **2106304-001BDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **6/28/2021**			RunNo: **68246**		
Client ID: **BMW-12**	Batch ID: **R68246**					Analysis Date: **6/28/2021**			SeqNo: **1378103**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	53.1	2.50						52.26	1.65	20	

Work Order: 2106304
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **MB-32698** SampType: **MBLK** Units: **mg/L** Prep Date: **6/17/2021** RunNo: **68148**
Client ID: **MBLKW** Batch ID: **32698** Analysis Date: **6/17/2021** SeqNo: **1375413**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									
Nitrite (as N)	ND	0.100									Q*
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.600									

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria
* - Flagged value is not within established control limits.

Sample ID: **LCS-32698** SampType: **LCS** Units: **mg/L** Prep Date: **6/17/2021** RunNo: **68148**
Client ID: **LCSW** Batch ID: **32698** Analysis Date: **6/17/2021** SeqNo: **1375414**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.710	0.100	0.7500	0	94.7	90	110				
Nitrite (as N)	0.669	0.100	0.7500	0	89.2	90	110				S
Nitrate (as N)	0.695	0.100	0.7500	0	92.7	90	110				
Sulfate	3.63	0.600	3.750	0	96.7	90	110				

NOTES:
S - Outlying spike recovery observed (low bias). Samples will be qualified with a *.

Sample ID: **2106304-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **6/17/2021** RunNo: **68148**
Client ID: **BMW-12** Batch ID: **32698** Analysis Date: **6/17/2021** SeqNo: **1375416**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	5.27	0.100						5.264	0.0570	20	EQ
Nitrite (as N)	ND	0.100						0		20	Q*
Nitrate (as N)	1.08	0.100						1.091	0.551	20	Q
Sulfate	7.52	0.600						7.507	0.173	20	Q

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria
* - Flagged value is not within established control limits.

Work Order: 2106304
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **2106304-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **6/17/2021** RunNo: **68148**
Client ID: **BMW-12** Batch ID: **32698** Analysis Date: **6/17/2021** SeqNo: **1375417**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	6.18	0.100	0.7500	5.264	122	80	120				ES
Nitrite (as N)	0.712	0.100	0.7500	0	94.9	80	120				
Nitrate (as N)	1.96	0.100	0.7500	1.091	116	80	120				
Sulfate	11.7	0.600	3.750	7.507	113	80	120				

NOTES:
S - Analyte concentration was too high for accurate spike recovery(ies).

Sample ID: **2106304-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **6/17/2021** RunNo: **68148**
Client ID: **BMW-12** Batch ID: **32698** Analysis Date: **6/17/2021** SeqNo: **1375418**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	6.17	0.100	0.7500	5.264	121	80	120	6.178	0.0972	20	ES
Nitrite (as N)	0.704	0.100	0.7500	0	93.9	80	120	0.7120	1.13	20	
Nitrate (as N)	1.95	0.100	0.7500	1.091	115	80	120	1.958	0.256	20	
Sulfate	11.7	0.600	3.750	7.507	113	80	120	11.73	0.0937	20	

NOTES:
S - Analyte concentration was too high for accurate spike recovery(ies).

Sample ID: **MB-32698** SampType: **MBLK** Units: **mg/L** Prep Date: **6/17/2021** RunNo: **68149**
Client ID: **MBLKW** Batch ID: **32698** Analysis Date: **6/18/2021** SeqNo: **1375429**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									
Nitrite (as N)	ND	0.100									
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.600									

Work Order: 2106304
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **LCS-32698** SampType: **LCS** Units: **mg/L** Prep Date: **6/17/2021** RunNo: **68149**
Client ID: **LCSW** Batch ID: **32698** Analysis Date: **6/18/2021** SeqNo: **1375430**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.723	0.100	0.7500	0	96.4	90	110				
Nitrite (as N)	0.724	0.100	0.7500	0	96.5	90	110				
Nitrate (as N)	0.738	0.100	0.7500	0	98.4	90	110				
Sulfate	3.71	0.600	3.750	0	98.9	90	110				

Sample ID: **2106304-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **6/17/2021** RunNo: **68149**
Client ID: **BMW-12** Batch ID: **32698** Analysis Date: **6/18/2021** SeqNo: **1375432**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	5.44	0.100						5.450	0.257	20	E
Nitrite (as N)	ND	0.100						0		20	H
Nitrate (as N)	1.21	0.100						1.224	1.32	20	H
Sulfate	7.81	0.600						7.845	0.409	20	

Sample ID: **2106304-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **6/17/2021** RunNo: **68149**
Client ID: **BMW-12** Batch ID: **32698** Analysis Date: **6/18/2021** SeqNo: **1375433**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	6.34	0.100	0.7500	5.450	119	80	120				E
Nitrite (as N)	0.728	0.100	0.7500	0	97.1	80	120				H
Nitrate (as N)	2.09	0.100	0.7500	1.224	115	80	120				H
Sulfate	12.0	0.600	3.750	7.845	111	80	120				

Sample ID: **2106304-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **6/17/2021** RunNo: **68149**
Client ID: **BMW-12** Batch ID: **32698** Analysis Date: **6/18/2021** SeqNo: **1375434**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	6.31	0.100	0.7500	5.450	115	80	120	6.340	0.411	20	E
Nitrite (as N)	0.698	0.100	0.7500	0	93.1	80	120	0.7280	4.21	20	H

Work Order: 2106304
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **2106304-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **6/17/2021** RunNo: **68149**
Client ID: **BMW-12** Batch ID: **32698** Analysis Date: **6/18/2021** SeqNo: **1375434**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	2.06	0.100	0.7500	1.224	111	80	120	2.087	1.30	20	H
Sulfate	12.0	0.600	3.750	7.845	112	80	120	12.01	0.125	20	

Work Order: 2106304
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Suspended Solids (TSS) by SM 2540D

Sample ID: **MB-R68113**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **6/22/2021**			RunNo: **68113**	
Client ID: **MBLKW**	Batch ID: **R68113**					Analysis Date: **6/22/2021**			SeqNo: **1374428**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Suspended Solids	ND	3.00									

Sample ID: **LCS-R68113**	SampType: **LCS**			Units: **mg/L**		Prep Date: **6/22/2021**			RunNo: **68113**	
Client ID: **LCSW**	Batch ID: **R68113**					Analysis Date: **6/22/2021**			SeqNo: **1374429**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Suspended Solids	334	3.00	300.0	0	111	65	135				

Sample ID: **2106304-004BDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **6/22/2021**			RunNo: **68113**	
Client ID: **BMW-114**	Batch ID: **R68113**					Analysis Date: **6/22/2021**			SeqNo: **1374434**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Suspended Solids	ND	3.00						0		30	

Work Order: 2106304
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-32700FB** SampType: **MBLK** Units: **µg/L** Prep Date: **6/18/2021** RunNo: **68150**
Client ID: **MBLKW** Batch ID: **32701** Analysis Date: **6/22/2021** SeqNo: **1375488**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	525									
Iron	ND	100									
Magnesium	ND	100									
Manganese	ND	1.80									
Potassium	ND	200									
Sodium	ND	250									

Sample ID: **MB-32701** SampType: **MBLK** Units: **µg/L** Prep Date: **6/18/2021** RunNo: **68150**
Client ID: **MBLKW** Batch ID: **32701** Analysis Date: **6/22/2021** SeqNo: **1375491**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	525									
Iron	ND	100									
Magnesium	ND	100									
Manganese	ND	1.80									
Potassium	ND	200									
Sodium	ND	250									

Sample ID: **LCS-32701** SampType: **LCS** Units: **µg/L** Prep Date: **6/18/2021** RunNo: **68150**
Client ID: **LCSW** Batch ID: **32701** Analysis Date: **6/22/2021** SeqNo: **1375492**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	1,140	100	1,000	0	114	50	150				
Magnesium	1,170	100	1,000	0	117	50	150				
Sodium	1,170	250	1,000	0	117	50	150				

Work Order: 2106304
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **2106273-011EDUP** SampType: **DUP** Units: **µg/L** Prep Date: **6/18/2021** RunNo: **68150**
Client ID: **BATCH** Batch ID: **32701** Analysis Date: **6/22/2021** SeqNo: **1375494**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	16,500	525						17,120	3.54	30	Q
Iron	ND	100						0		30	
Magnesium	12,600	100						12,880	2.52	30	
Manganese	6.07	1.80						5.859	3.55	30	Q
Potassium	1,360	200						1,374	0.817	30	Q
Sodium	7,170	250						7,296	1.79	30	

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: **2106273-011EMS** SampType: **MS** Units: **µg/L** Prep Date: **6/18/2021** RunNo: **68150**
Client ID: **BATCH** Batch ID: **32701** Analysis Date: **6/22/2021** SeqNo: **1375495**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	23,700	525	5,000	17,120	132	50	150				
Iron	5,440	100	5,000	62.09	107	50	150				
Magnesium	17,700	100	5,000	12,880	96.1	70	130				
Manganese	663	1.80	500.0	5.859	131	70	130				S
Potassium	7,330	200	5,000	1,374	119	50	150				
Sodium	13,200	250	5,000	7,296	118	50	150				

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed and recovered within range.

Sample ID: **2106273-011EMSD** SampType: **MSD** Units: **µg/L** Prep Date: **6/18/2021** RunNo: **68150**
Client ID: **BATCH** Batch ID: **32701** Analysis Date: **6/22/2021** SeqNo: **1375496**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	23,900	525	5,000	17,120	136	50	150	23,740	0.693	30	
Iron	5,760	100	5,000	62.09	114	50	150	5,437	5.70	30	
Magnesium	17,800	100	5,000	12,880	97.6	70	130	17,690	0.435	30	
Manganese	619	1.80	500.0	5.859	123	70	130	663.0	6.91	30	
Potassium	7,880	200	5,000	1,374	130	50	150	7,329	7.21	30	

Work Order: 2106304
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **2106273-011EMSD** SampType: **MSD** Units: **µg/L** Prep Date: **6/18/2021** RunNo: **68150**
Client ID: **BATCH** Batch ID: **32701** Analysis Date: **6/22/2021** SeqNo: **1375496**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	13,300	250	5,000	7,296	120	50	150	13,210	0.486	30	

Sample ID: **LCS-32701** SampType: **LCS** Units: **µg/L** Prep Date: **6/18/2021** RunNo: **68150**
Client ID: **LCSW** Batch ID: **32701** Analysis Date: **6/23/2021** SeqNo: **1376266**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	987	525	1,000	0	98.7	50	150				
Potassium	1,370	200	1,000	0	137	50	150				

Work Order: 2106304
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **MB-32702**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **6/18/2021**			RunNo: **68097**		
Client ID: **MBLKW**	Batch ID: **32702**					Analysis Date: **6/21/2021**			SeqNo: **1374224**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	5.00									

Sample ID: **2106303-001AMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **6/18/2021**			RunNo: **68097**		
Client ID: **BATCH**	Batch ID: **32702**					Analysis Date: **6/21/2021**			SeqNo: **1374228**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	600	5.00	500.0	35.38	113	70	130				

Sample ID: **2106303-001AMSD**	SampType: **MSD**			Units: **µg/L**		Prep Date: **6/18/2021**			RunNo: **68097**		
Client ID: **BATCH**	Batch ID: **32702**					Analysis Date: **6/21/2021**			SeqNo: **1374231**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	584	5.00	500.0	35.38	110	70	130	600.0	2.77	30	

Sample ID: **LCS-32702**	SampType: **LCS**			Units: **µg/L**		Prep Date: **6/18/2021**			RunNo: **68097**		
Client ID: **LCSW**	Batch ID: **32702**					Analysis Date: **6/22/2021**			SeqNo: **1374501**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	109	5.00	100.0	0	109	85	115				

Sample ID: **2106303-001ADUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **6/18/2021**			RunNo: **68097**		
Client ID: **BATCH**	Batch ID: **32702**					Analysis Date: **6/22/2021**			SeqNo: **1374503**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	24.9	5.00						24.70	0.700	30	

Work Order: 2106304
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D SIM

Sample ID: **LCS-32699**	SampType: **LCS**			Units: **µg/L**		Prep Date: **6/18/2021**		RunNo: **68080**		
Client ID: **LCSW**	Batch ID: **32699**					Analysis Date: **6/18/2021**		SeqNo: **1373895**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	4.60	0.0100	5.000	0	92.0	52.6	121				
1,1-Dichloroethene	4.71	0.0100	5.000	0	94.2	62.2	120				
Surr: Dibromofluoromethane	9.72		10.00		97.2	80	120				
Surr: Toluene-d8	10.1		10.00		101	80	120				
Surr: 1-Bromo-4-fluorobenzene	10.4		10.00		104	80	120				

Sample ID: **MB-32699**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **6/18/2021**		RunNo: **68080**		
Client ID: **MBLKW**	Batch ID: **32699**					Analysis Date: **6/18/2021**		SeqNo: **1374076**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100									
1,1-Dichloroethene	ND	0.0100									
Surr: Dibromofluoromethane	10.4		10.00		104	80	120				
Surr: Toluene-d8	9.74		10.00		97.4	80	120				
Surr: 1-Bromo-4-fluorobenzene	9.32		10.00		93.2	80	120				

Sample ID: **2106267-001EDUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **6/18/2021**		RunNo: **68080**		
Client ID: **BATCH**	Batch ID: **32699**					Analysis Date: **6/18/2021**		SeqNo: **1373883**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100						0		30	
1,1-Dichloroethene	ND	0.0100						0		30	
Surr: Dibromofluoromethane	10.4		10.00		104	80	120		0		
Surr: Toluene-d8	9.96		10.00		99.6	80	120		0		
Surr: 1-Bromo-4-fluorobenzene	9.36		10.00		93.6	80	120		0		

Work Order: 2106304
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D SIM

Sample ID: **2106304-001DDUP** SampType: **DUP** Units: **µg/L** Prep Date: **6/18/2021** RunNo: **68080**
Client ID: **BMW-12** Batch ID: **32699** Analysis Date: **6/18/2021** SeqNo: **1373886**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0100						0		30	
1,1-Dichloroethene	ND	0.0100						0		30	
Surr: Dibromofluoromethane	10.5		10.00		105	80	120		0		
Surr: Toluene-d8	10.1		10.00		101	80	120		0		
Surr: 1-Bromo-4-fluorobenzene	9.32		10.00		93.2	80	120		0		

Sample ID: **2106267-001EMS** SampType: **MS** Units: **µg/L** Prep Date: **6/18/2021** RunNo: **68080**
Client ID: **BATCH** Batch ID: **32699** Analysis Date: **6/18/2021** SeqNo: **1373884**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	4.96	0.0100	5.000	0	99.2	55.8	134				
1,1-Dichloroethene	5.27	0.0100	5.000	0	105	71.2	135				
Surr: Dibromofluoromethane	10.4		10.00		104	80	120				
Surr: Toluene-d8	10.3		10.00		103	80	120				
Surr: 1-Bromo-4-fluorobenzene	10.5		10.00		105	80	120				

Sample Log-In Check List

Client Name:	**COBI**	Work Order Number:	**2106304**
Logged by:	**Carissa True**	Date Received:	**6/16/2021 12:45:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes	☑	No ☐	Not Present	☐
2.	How was the sample delivered?	Client				

Log In

3.	Coolers are present?	Yes	☑	No ☐	NA	☐
4.	Shipping container/cooler in good condition?	Yes	☑	No ☐		
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes	☐	No ☐	Not Present	☑
6.	Was an attempt made to cool the samples?	Yes	☑	No ☐	NA	☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes	☑	No ☐	NA	☐
8.	Sample(s) in proper container(s)?	Yes	☑	No ☐		
9.	Sufficient sample volume for indicated test(s)?	Yes	☑	No ☐		
10.	Are samples properly preserved?	Yes	☑	No ☐		
11.	Was preservative added to bottles?	Yes	☐	No ☑	NA	☐
12.	Is there headspace in the VOA vials?	Yes	☐	No ☑	NA	☐
13.	Did all samples containers arrive in good condition(unbroken)?	Yes	☑	No ☐		
14.	Does paperwork match bottle labels?	Yes	☑	No ☐		
15.	Are matrices correctly identified on Chain of Custody?	Yes	☑	No ☐		
16.	Is it clear what analyses were requested?	Yes	☑	No ☐		
17.	Were all holding times able to be met?	Yes	☑	No ☐		

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes	☑	No ☐	NA	☐

Person Notified:	Rav Navarette	Date:	6/17/2021
By Whom:	Clare Griggs	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Confirming COC/analyses.		
Client Instructions:	Analyze per attached Table for Groundwater, see revised COC.		

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample 1	4.5

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: Page: of:

Laboratory Project No (internal): 2108304

Project Name: Vincent Landfill Groundwater

Special Remarks: VOCS: 1,1 - DCE, VC only.

Client: City of Bainbridge Island

Project No:

Address: 7305 NE Hidden Cove Rd

Collected by: Ray Navarette

City, State, Zip: Bainbridge Island, WA 98110

Location: Vincent Landfill

Telephone: 206-780-3585

Report To (PM): Aaron Claiborne

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Fax: 206-780-5104

PM Email: Aclaiborne@bainbridgewa.gov

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	# of Cont.	VOCs (EPA 8260 / 624)	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T)	Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1	BMW-12	6-16-21	6:35	GW	6	X								X	X				
2	BMW-13	6-16-21	7:40	GW	6	X								X	X				
3	BMW-14	6-16-21	8:35	GW	6	X								X	X				
4	BMW-114	6-16-21	8:35	GW	6	X								X	X				
5	BMW-15	6-16-21	9:35	GW	8	X								X	X				Collect 2 additional VOAs
6	BOW-37	6-16-21	10:25	GW	6	X								X	X				
7																			
8																			
9																			
10																			

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:
☒ Standard ☐ Next Day
☐ 3 Day ☐ Same Day
☐ 2 Day (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished (Signature)	Print Name	Date/Time	Received (Signature)	Print Name	Date/Time
x	Ray Navarette	6-16-2021	x	Gabrielle Coeville	6/16/21 12:30
x Gabrielle Coeville	Gabrielle Coeville	6/16/21 12:45	x	Oliver Hou	6/16/21 1245

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: Page: of:

Laboratory Project No (internal): 21068304

Project Name: Vincent Landfill Groundwater

Special Remarks: VOCS: 1,1 - DCE, VC only. * VOCs by 8260 SIM edits 6/17/21 -CG

Client: City of Bainbridge Island

Project No:

Address: 7305 NE Hidden Cove Rd

Collected by: Ray Navarette

City, State, Zip: Bainbridge Island, WA 98110

Location: Vincent Landfill

Telephone: 206-780-3585

Report To (PM): Aaron Claiborne

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Fax: 206-780-5104

PM Email: Aclaiborne@bainbridgewa.gov

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	# of Cont.	VOCs (EPA 8260 / 624) *	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T) | Dissolved (D) **	Anions (IC)***	EDB (8011)	Alkalinity	TSS	Comments
1 BMW-12	6-16-21	6:35	GW	6	X							X	T/D	X			X	X	
2 BMW-13	6-16-21	7:40	GW	6	X							X	T/D	X			X	X	
3 BMW-14	6-16-21	8:35	GW	6	X							X	T/D	X			X	X	
4 BMW-114	6-16-21	8:35	GW	6	X							X	T/D	X			X	X	
5 BMW-15	6-16-21	9:35	GW	8	X							X	T/D	X			X	X	Collect 2 additional VOAs
6 BOW-37	6-16-21	10:25	GW	6	X							X	T/D	X			X	X	
7																			
8																			
9																			
10																			

**Total = Mn
Diss = Ca, Fe, Mg, Mn, K, Na

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time: ☒ Standard ☐ Next Day ☐ 3 Day ☐ Same Day ☐ 2 Day (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished (Signature)	Print Name	Date/Time	Received (Signature)	Print Name	Date/Time
x	Ray Navarette	6-16-2021	x	Gabrielle Coeville	6/16/21 12:30
x Gabrielle Coeville	Gabrielle Coeville	6/16/21 12:45	x	Oliver Hou	6/16/21 1245

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Landfill Groundwater
Work Order Number: 2112259

December 23, 2021

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 7 sample(s) on 12/15/2021 for the analyses presented in the following report.

Dissolved Metals by EPA Method 200.8
Ion Chromatography by EPA Method 300.0
Total Metals by EPA Method 200.8
Volatile Organic Compounds by EPA Method 8260D

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *12/23/2021*

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Work Order: 2112259

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2112259-001	BMW-12	12/15/2021 6:38 AM	12/15/2021 1:08 PM
2112259-001	BMW-12	12/15/2021 6:38 AM	12/15/2021 1:08 PM
2112259-002	BMW-13	12/15/2021 7:38 AM	12/15/2021 1:08 PM
2112259-002	BMW-13	12/15/2021 7:38 AM	12/15/2021 1:08 PM
2112259-003	BMW-14	12/15/2021 8:35 AM	12/15/2021 1:08 PM
2112259-003	BMW-14	12/15/2021 8:35 AM	12/15/2021 1:08 PM
2112259-004	BMW-114	12/15/2021 8:35 AM	12/15/2021 1:08 PM
2112259-004	BMW-114	12/15/2021 8:35 AM	12/15/2021 1:08 PM
2112259-005	BMW-15	12/15/2021 9:25 AM	12/15/2021 1:08 PM
2112259-005	BMW-15	12/15/2021 9:25 AM	12/15/2021 1:08 PM
2112259-006	BOW-37	12/15/2021 11:10 AM	12/15/2021 1:08 PM
2112259-006	BOW-37	12/15/2021 11:10 AM	12/15/2021 1:08 PM
2112259-007	Trip Blank		12/15/2021 1:08 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2112259**

Date: **12/23/2021**

CLIENT: City of Bainbridge Island

Project: Vincent Landfill Groundwater

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2112259**
Date Reported: **12/23/2021**

Client: City of Bainbridge Island **Collection Date:** 12/15/2021 6:38:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2112259-001 **Matrix:** Groundwater
Client Sample ID: **BMW-12**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 34789		Analyst: TN
Vinyl chloride	ND	0.200		µg/L	1	12/16/2021 6:16:14 PM
1,1-Dichloroethene	ND	0.500		µg/L	1	12/16/2021 6:16:14 PM
Surr: Dibromofluoromethane	103	80 - 120		%Rec	1	12/16/2021 6:16:14 PM
Surr: Toluene-d8	106	80 - 120		%Rec	1	12/16/2021 6:16:14 PM
Surr: 1-Bromo-4-fluorobenzene	101	80 - 120		%Rec	1	12/16/2021 6:16:14 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 34778		Analyst: SLL
Chloride	14.9	1.00	D	mg/L	10	12/16/2021 7:47:00 PM
Nitrite (as N)	ND	1.00	D	mg/L	10	12/16/2021 7:47:00 PM
Nitrate (as N)	1.87	1.00	D	mg/L	10	12/16/2021 7:47:00 PM
Sulfate	9.26	6.00	D	mg/L	10	12/16/2021 7:47:00 PM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 200.8				Batch ID: 34826		Analyst: EH
Calcium	14,600	1,050	D	µg/L	2	12/21/2021 11:28:28 AM
Iron	ND	200	D	µg/L	2	12/21/2021 11:28:28 AM
Magnesium	11,100	200	D	µg/L	2	12/21/2021 11:28:28 AM
Potassium	1,120	400	D	µg/L	2	12/21/2021 11:28:28 AM
Sodium	7,450	500	D	µg/L	2	12/21/2021 11:28:28 AM
Total Metals by EPA Method 200.8				Batch ID: 34798		Analyst: EH
Calcium	14,800	1,000	D	µg/L	5	12/22/2021 7:47:45 PM
Iron	ND	1,000	D	µg/L	10	12/21/2021 5:13:12 PM
Magnesium	10,300	1,000	D	µg/L	10	12/21/2021 5:13:12 PM
Potassium	924	2,000	JD	µg/L	10	12/21/2021 5:13:12 PM
Sodium	6,430	2,000	D	µg/L	10	12/21/2021 5:13:12 PM

Analytical Report

Work Order: **2112259**
Date Reported: **12/23/2021**

Client: City of Bainbridge Island
Collection Date: 12/15/2021 7:38:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2112259-002
Matrix: Groundwater
Client Sample ID: **BMW-13**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 34789		Analyst: TN
Vinyl chloride	ND	0.200		µg/L	1	12/16/2021 6:46:26 PM
1,1-Dichloroethene	ND	0.500		µg/L	1	12/16/2021 6:46:26 PM
Surr: Dibromofluoromethane	102	80 - 120		%Rec	1	12/16/2021 6:46:26 PM
Surr: Toluene-d8	105	80 - 120		%Rec	1	12/16/2021 6:46:26 PM
Surr: 1-Bromo-4-fluorobenzene	97.6	80 - 120		%Rec	1	12/16/2021 6:46:26 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 34778		Analyst: SLL
Chloride	8.57	0.500	D	mg/L	5	12/16/2021 8:33:00 PM
Nitrite (as N)	ND	0.200	D	mg/L	2	12/16/2021 8:10:00 PM
Nitrate (as N)	0.240	0.200	D	mg/L	2	12/16/2021 8:10:00 PM
Sulfate	25.3	1.20	D	mg/L	2	12/16/2021 8:10:00 PM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 200.8				Batch ID: 34826		Analyst: EH
Calcium	74,600	5,250	D	µg/L	10	12/21/2021 12:10:18 PM
Iron	ND	200	D	µg/L	2	12/21/2021 11:04:15 AM
Magnesium	66,300	1,000	D	µg/L	10	12/21/2021 12:10:18 PM
Potassium	2,530	400	D	µg/L	2	12/21/2021 11:04:15 AM
Sodium	17,800	500	D	µg/L	2	12/21/2021 11:04:15 AM
Total Metals by EPA Method 200.8				Batch ID: 34798		Analyst: EH
Calcium	75,000	10,000	D	µg/L	50	12/22/2021 7:53:19 PM
Iron	ND	1,000	D	µg/L	10	12/21/2021 5:16:06 PM
Magnesium	65,200	5,000	D	µg/L	50	12/22/2021 7:53:19 PM
Potassium	2,170	2,000	D	µg/L	10	12/21/2021 5:16:06 PM
Sodium	16,300	2,000	D	µg/L	10	12/21/2021 5:16:06 PM

Analytical Report

Work Order: **2112259**
Date Reported: **12/23/2021**

Client: City of Bainbridge Island
Collection Date: 12/15/2021 8:35:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2112259-003
Matrix: Groundwater
Client Sample ID: **BMW-14**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 34789		Analyst: TN
Vinyl chloride	ND	0.200		µg/L	1	12/16/2021 7:16:37 PM
1,1-Dichloroethene	ND	0.500		µg/L	1	12/16/2021 7:16:37 PM
Surr: Dibromofluoromethane	106	80 - 120		%Rec	1	12/16/2021 7:16:37 PM
Surr: Toluene-d8	108	80 - 120		%Rec	1	12/16/2021 7:16:37 PM
Surr: 1-Bromo-4-fluorobenzene	99.5	80 - 120		%Rec	1	12/16/2021 7:16:37 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 34778		Analyst: SLL
Chloride	8.70	0.500	D	mg/L	5	12/16/2021 9:19:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	12/16/2021 8:56:00 PM
Nitrate (as N)	0.100	0.100		mg/L	1	12/16/2021 8:56:00 PM
Sulfate	38.4	3.00	D	mg/L	5	12/16/2021 9:19:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 34826		Analyst: EH
Calcium	65,000	5,250	D	µg/L	10	12/21/2021 12:13:46 PM
Iron	ND	200	D	µg/L	2	12/21/2021 11:14:37 AM
Magnesium	58,600	1,000	D	µg/L	10	12/21/2021 12:13:46 PM
Potassium	3,150	400	D	µg/L	2	12/21/2021 11:14:37 AM
Sodium	27,500	500	D	µg/L	2	12/21/2021 11:14:37 AM
Total Metals by EPA Method 200.8				Batch ID: 34798		Analyst: EH
Calcium	60,200	10,000	D	µg/L	50	12/22/2021 8:10:03 PM
Iron	ND	1,000	D	µg/L	10	12/21/2021 5:19:00 PM
Magnesium	54,200	5,000	D	µg/L	50	12/22/2021 8:10:03 PM
Potassium	2,650	2,000	D	µg/L	10	12/21/2021 5:19:00 PM
Sodium	25,200	2,000	D	µg/L	10	12/21/2021 5:19:00 PM

Analytical Report

Work Order: **2112259**
Date Reported: **12/23/2021**

Client: City of Bainbridge Island
Collection Date: 12/15/2021 8:35:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2112259-004
Matrix: Groundwater
Client Sample ID: **BMW-114**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 34789		Analyst: TN
Vinyl chloride	ND	0.200		µg/L	1	12/16/2021 7:46:49 PM
1,1-Dichloroethene	ND	0.500		µg/L	1	12/16/2021 7:46:49 PM
Surr: Dibromofluoromethane	99.8	80 - 120		%Rec	1	12/16/2021 7:46:49 PM
Surr: Toluene-d8	105	80 - 120		%Rec	1	12/16/2021 7:46:49 PM
Surr: 1-Bromo-4-fluorobenzene	98.4	80 - 120		%Rec	1	12/16/2021 7:46:49 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 34778		Analyst: SLL
Chloride	8.74	0.500	D	mg/L	5	12/16/2021 10:05:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	12/16/2021 9:42:00 PM
Nitrate (as N)	ND	0.100		mg/L	1	12/16/2021 9:42:00 PM
Sulfate	38.8	3.00	D	mg/L	5	12/16/2021 10:05:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 34826		Analyst: EH
Calcium	58,000	5,250	D	µg/L	10	12/21/2021 12:24:10 PM
Iron	ND	200	D	µg/L	2	12/21/2021 11:18:05 AM
Magnesium	58,100	1,000	D	µg/L	10	12/21/2021 12:24:10 PM
Potassium	2,780	400	D	µg/L	2	12/21/2021 11:18:05 AM
Sodium	24,100	500	D	µg/L	2	12/21/2021 11:18:05 AM
Total Metals by EPA Method 200.8				Batch ID: 34798		Analyst: EH
Calcium	70,000	10,000	D	µg/L	50	12/22/2021 8:15:37 PM
Iron	ND	1,000	D	µg/L	10	12/21/2021 5:21:54 PM
Magnesium	59,600	5,000	D	µg/L	50	12/22/2021 8:15:37 PM
Potassium	2,550	2,000	D	µg/L	10	12/21/2021 5:21:54 PM
Sodium	25,400	2,000	D	µg/L	10	12/21/2021 5:21:54 PM

Analytical Report

Work Order: **2112259**
Date Reported: **12/23/2021**

Client: City of Bainbridge Island
Collection Date: 12/15/2021 9:25:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2112259-005
Matrix: Groundwater
Client Sample ID: **BMW-15**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 34789		Analyst: TN
Vinyl chloride	ND	0.200		µg/L	1	12/16/2021 8:17:06 PM
1,1-Dichloroethene	ND	0.500		µg/L	1	12/16/2021 8:17:06 PM
Surr: Dibromofluoromethane	100	80 - 120		%Rec	1	12/16/2021 8:17:06 PM
Surr: Toluene-d8	105	80 - 120		%Rec	1	12/16/2021 8:17:06 PM
Surr: 1-Bromo-4-fluorobenzene	98.8	80 - 120		%Rec	1	12/16/2021 8:17:06 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 34778		Analyst: SLL
Chloride	27.4	2.00	D	mg/L	20	12/17/2021 12:01:00 AM
Nitrite (as N)	ND	2.00	D	mg/L	20	12/17/2021 12:01:00 AM
Nitrate (as N)	4.00	2.00	D	mg/L	20	12/17/2021 12:01:00 AM
Sulfate	43.4	12.0	D	mg/L	20	12/17/2021 12:01:00 AM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 200.8				Batch ID: 34826		Analyst: EH
Calcium	50,000	1,050	D	µg/L	2	12/21/2021 11:21:32 AM
Iron	ND	200	D	µg/L	2	12/21/2021 11:21:32 AM
Magnesium	40,300	200	D	µg/L	2	12/21/2021 11:21:32 AM
Potassium	2,640	400	D	µg/L	2	12/21/2021 11:21:32 AM
Sodium	36,400	500	D	µg/L	2	12/21/2021 11:21:32 AM
Total Metals by EPA Method 200.8				Batch ID: 34798		Analyst: EH
Calcium	56,000	10,000	D	µg/L	50	12/22/2021 8:21:11 PM
Iron	ND	1,000	D	µg/L	10	12/21/2021 5:24:48 PM
Magnesium	38,900	1,000	D	µg/L	10	12/21/2021 5:24:48 PM
Potassium	2,450	2,000	D	µg/L	10	12/21/2021 5:24:48 PM
Sodium	35,800	2,000	D	µg/L	10	12/21/2021 5:24:48 PM

Analytical Report

Work Order: **2112259**
Date Reported: **12/23/2021**

Client: City of Bainbridge Island
Collection Date: 12/15/2021 11:10:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2112259-006
Matrix: Groundwater
Client Sample ID: **BOW-37**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 34789		Analyst: TN
Vinyl chloride	ND	0.200		µg/L	1	12/16/2021 9:17:33 PM
1,1-Dichloroethene	ND	0.500		µg/L	1	12/16/2021 9:17:33 PM
Surr: Dibromofluoromethane	100	80 - 120		%Rec	1	12/16/2021 9:17:33 PM
Surr: Toluene-d8	105	80 - 120		%Rec	1	12/16/2021 9:17:33 PM
Surr: 1-Bromo-4-fluorobenzene	98.1	80 - 120		%Rec	1	12/16/2021 9:17:33 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 34778		Analyst: SLL
Chloride	5.40	0.500	D	mg/L	5	12/17/2021 12:24:00 AM
Nitrite (as N)	ND	0.500	D	mg/L	5	12/17/2021 12:24:00 AM
Nitrate (as N)	1.06	0.500	D	mg/L	5	12/17/2021 12:24:00 AM
Sulfate	7.84	3.00	D	mg/L	5	12/17/2021 12:24:00 AM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 200.8				Batch ID: 34826		Analyst: EH
Calcium	21,100	1,050	D	µg/L	2	12/21/2021 11:25:00 AM
Iron	ND	200	D	µg/L	2	12/21/2021 11:25:00 AM
Magnesium	19,000	200	D	µg/L	2	12/21/2021 11:25:00 AM
Potassium	1,980	400	D	µg/L	2	12/21/2021 11:25:00 AM
Sodium	14,400	500	D	µg/L	2	12/21/2021 11:25:00 AM
Total Metals by EPA Method 200.8				Batch ID: 34798		Analyst: EH
Calcium	24,500	2,000	D	µg/L	10	12/22/2021 8:26:45 PM
Iron	ND	1,000	D	µg/L	10	12/21/2021 5:27:42 PM
Magnesium	19,000	1,000	D	µg/L	10	12/21/2021 5:27:42 PM
Potassium	2,060	2,000	D	µg/L	10	12/21/2021 5:27:42 PM
Sodium	14,900	2,000	D	µg/L	10	12/21/2021 5:27:42 PM

Work Order: 2112259
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **MB-34778** SampType: **MBLK** Units: **mg/L** Prep Date: **12/15/2021** RunNo: **72041**
Client ID: **MBLKW** Batch ID: **34778** Analysis Date: **12/15/2021** SeqNo: **1472757**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									
Nitrite (as N)	ND	0.100									
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.600									

Sample ID: **2112221-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **12/15/2021** RunNo: **72041**
Client ID: **BATCH** Batch ID: **34778** Analysis Date: **12/15/2021** SeqNo: **1472760**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.100						0		20	H

Sample ID: **2112221-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **12/15/2021** RunNo: **72041**
Client ID: **BATCH** Batch ID: **34778** Analysis Date: **12/15/2021** SeqNo: **1472762**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.662	0.100	0.7500	0.08600	76.8	80	120				SH

Sample ID: **2112221-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **12/15/2021** RunNo: **72041**
Client ID: **BATCH** Batch ID: **34778** Analysis Date: **12/15/2021** SeqNo: **1472763**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.764	0.100	0.7500	0.08600	90.4	80	120	0.6620	14.3	20	H

Sample ID: **LCS-34778** SampType: **LCS** Units: **mg/L** Prep Date: **12/15/2021** RunNo: **72041**
Client ID: **LCSW** Batch ID: **34778** Analysis Date: **12/16/2021** SeqNo: **1469790**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.689	0.100	0.7500	0	91.9	90	110				

Work Order: 2112259
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **LCS-34778** SampType: **LCS** Units: **mg/L** Prep Date: **12/15/2021** RunNo: **72041**
Client ID: **LCSW** Batch ID: **34778** Analysis Date: **12/16/2021** SeqNo: **1469790**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	0.699	0.100	0.7500	0	93.2	90	110				
Nitrate (as N)	0.688	0.100	0.7500	0	91.7	90	110				
Sulfate	3.40	0.600	3.750	0	90.7	90	110				

Sample ID: **MB-34778** SampType: **MBLK** Units: **mg/L** Prep Date: **12/15/2021** RunNo: **72041**
Client ID: **MBLKW** Batch ID: **34778** Analysis Date: **12/16/2021** SeqNo: **1469791**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									
Nitrite (as N)	ND	0.100									
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.600									

Sample ID: **2112259-004DDUP** SampType: **DUP** Units: **mg/L** Prep Date: **12/15/2021** RunNo: **72041**
Client ID: **BMW-114** Batch ID: **34778** Analysis Date: **12/16/2021** SeqNo: **1469755**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	8.98	0.500						8.740	2.76	20	D
Nitrite (as N)	ND	0.500						0		20	D
Nitrate (as N)	ND	0.500						0		20	D
Sulfate	39.8	3.00						38.79	2.58	20	D

Sample ID: **2112259-004DMS** SampType: **MS** Units: **mg/L** Prep Date: **12/15/2021** RunNo: **72041**
Client ID: **BMW-114** Batch ID: **34778** Analysis Date: **12/16/2021** SeqNo: **1469758**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	12.9	0.500	3.750	8.740	112	80	120				D
Nitrite (as N)	3.42	0.500	3.750	0	91.1	80	120				D
Nitrate (as N)	3.50	0.500	3.750	0	93.2	80	120				D

Work Order: 2112259
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **2112259-004DMS** SampType: **MS** Units: **mg/L** Prep Date: **12/15/2021** RunNo: **72041**
Client ID: **BMW-114** Batch ID: **34778** Analysis Date: **12/16/2021** SeqNo: **1469758**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	59.9	3.00	18.75	38.79	113	80	120				D

Sample ID: **2112221-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **12/15/2021** RunNo: **72041**
Client ID: **BATCH** Batch ID: **34778** Analysis Date: **12/17/2021** SeqNo: **1469763**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	4.75	0.100						4.730	0.443	20	E
Nitrite (as N)	ND	0.100						0		20	H
Nitrate (as N)	ND	0.100						0		20	H
Sulfate	1.89	0.600						1.860	1.44	20	

Sample ID: **2112221-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **12/15/2021** RunNo: **72041**
Client ID: **BATCH** Batch ID: **34778** Analysis Date: **12/17/2021** SeqNo: **1469764**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	5.58	0.100	0.7500	4.730	113	80	120				E
Nitrite (as N)	0.671	0.100	0.7500	0	89.5	80	120				H
Nitrate (as N)	0.690	0.100	0.7500	0	92.0	80	120				H
Sulfate	5.36	0.600	3.750	1.860	93.4	80	120				

Sample ID: **2112221-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **12/15/2021** RunNo: **72041**
Client ID: **BATCH** Batch ID: **34778** Analysis Date: **12/17/2021** SeqNo: **1469770**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	5.59	0.100	0.7500	4.730	115	80	120	5.577	0.251	20	E
Nitrite (as N)	0.668	0.100	0.7500	0	89.1	80	120	0.6710	0.448	20	H
Nitrate (as N)	0.692	0.100	0.7500	0	92.3	80	120	0.6900	0.289	20	H
Sulfate	5.38	0.600	3.750	1.860	94.0	80	120	5.361	0.447	20	

Work Order: 2112259
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-34826** SampType: **MBLK** Units: **µg/L** Prep Date: **12/21/2021** RunNo: **72115**
Client ID: **MBLKW** Batch ID: **34826** Analysis Date: **12/21/2021** SeqNo: **1472404**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	525									
Iron	ND	100									
Magnesium	ND	100									
Potassium	ND	200									
Sodium	ND	250									

Sample ID: **LCS-34826** SampType: **LCS** Units: **µg/L** Prep Date: **12/21/2021** RunNo: **72115**
Client ID: **LCSW** Batch ID: **34826** Analysis Date: **12/21/2021** SeqNo: **1472405**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	4,980	525	5,000	0	99.5	85	115				
Iron	5,130	100	5,000	0	103	85	115				
Magnesium	5,480	100	5,000	0	110	85	115				
Potassium	5,040	200	5,000	0	101	85	115				
Sodium	5,050	250	5,000	0	101	85	115				

Sample ID: **2112259-002CDUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/21/2021** RunNo: **72115**
Client ID: **BMW-13** Batch ID: **34826** Analysis Date: **12/21/2021** SeqNo: **1472407**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	68,000	1,050						79,680	15.8	30	DE
Iron	ND	200						0		30	D
Magnesium	64,500	200						70,600	9.09	30	DE
Potassium	2,120	400						2,535	17.6	30	D
Sodium	14,800	500						17,770	18.5	30	D

Work Order: 2112259
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **2112259-002CMS** SampType: **MS** Units: **µg/L** Prep Date: **12/21/2021** RunNo: **72115**
Client ID: **BMW-13** Batch ID: **34826** Analysis Date: **12/21/2021** SeqNo: **1472408**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	84,500	1,050	5,000	79,680	96.5	50	150				DE
Iron	9,450	200	5,000	0	189	50	150				DS
Magnesium	77,200	200	5,000	70,600	132	70	130				DES
Potassium	13,200	400	5,000	2,535	213	50	150				DS
Sodium	25,700	500	5,000	17,770	159	50	150				DS

NOTES:
S - Analyte concentration was too high for accurate spike recovery(ies).

Work Order: 2112259
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **MB-34798** SampType: **MBLK** Units: **µg/L** Prep Date: **12/17/2021** RunNo: **72142**
Client ID: **MBLKW** Batch ID: **34798** Analysis Date: **12/21/2021** SeqNo: **1471932**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	ND	100									
Magnesium	ND	100									
Potassium	ND	200									
Sodium	ND	200									

Sample ID: **LCS-34798** SampType: **LCS** Units: **µg/L** Prep Date: **12/17/2021** RunNo: **72142**
Client ID: **LCSW** Batch ID: **34798** Analysis Date: **12/21/2021** SeqNo: **1471933**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	1,010	100	1,000	0	101	85	115				
Magnesium	1,040	100	1,000	0	104	85	115				
Potassium	957	200	1,000	0	95.7	85	115				
Sodium	951	200	1,000	0	95.1	85	115				

Sample ID: **2112273-001ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/17/2021** RunNo: **72142**
Client ID: **BATCH** Batch ID: **34798** Analysis Date: **12/21/2021** SeqNo: **1471935**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	482	100						524.8	8.56	30	
Magnesium	199	100						228.8	13.8	30	
Potassium	354	200						414.5	15.7	30	
Sodium	3,550	200						4,091	14.1	30	

Sample ID: **2112273-001AMS** SampType: **MS** Units: **µg/L** Prep Date: **12/17/2021** RunNo: **72142**
Client ID: **BATCH** Batch ID: **34798** Analysis Date: **12/21/2021** SeqNo: **1471936**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	1,630	100	1,000	524.8	111	50	150				
Magnesium	1,240	100	1,000	228.8	102	70	130				

Work Order: 2112259
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **2112273-001AMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **12/17/2021**		RunNo: **72142**		
Client ID: **BATCH**	Batch ID: **34798**					Analysis Date: **12/21/2021**		SeqNo: **1471936**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	1,530	200	1,000	414.5	111	50	150				
Sodium	5,490	200	1,000	4,091	140	50	150				E

Sample ID: **MB-34798**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/17/2021**		RunNo: **72142**		
Client ID: **MBLKW**	Batch ID: **34798**					Analysis Date: **12/22/2021**		SeqNo: **1473134**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	200									

Sample ID: **LCS-34798**	SampType: **LCS**			Units: **µg/L**		Prep Date: **12/17/2021**		RunNo: **72142**		
Client ID: **LCSW**	Batch ID: **34798**					Analysis Date: **12/22/2021**		SeqNo: **1473135**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	997	200	1,000	0	99.7	85	115				

Sample ID: **2112273-001ADUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **12/17/2021**		RunNo: **72142**		
Client ID: **BATCH**	Batch ID: **34798**					Analysis Date: **12/22/2021**		SeqNo: **1473137**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	1,510	200						1,550	2.40	30	

Sample ID: **2112273-001AMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **12/17/2021**		RunNo: **72142**		
Client ID: **BATCH**	Batch ID: **34798**					Analysis Date: **12/22/2021**		SeqNo: **1473138**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	2,190	200	1,000	1,550	64.1	50	150				

Work Order: 2112259
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **LCS-34789**	SampType: **LCS**			Units: **µg/L**		Prep Date: **12/16/2021**		RunNo: **72055**		
Client ID: **LCSW**	Batch ID: **34789**					Analysis Date: **12/16/2021**		SeqNo: **1470122**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	19.7	0.200	20.00	0	98.4	80	120				
1,1-Dichloroethene	23.6	0.500	20.00	0	118	80	120				
Surr: Dibromofluoromethane	27.5		25.00		110	80	120				
Surr: Toluene-d8	27.0		25.00		108	80	120				
Surr: 1-Bromo-4-fluorobenzene	27.7		25.00		111	80	120				

Sample ID: **MB-34789**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/16/2021**		RunNo: **72055**		
Client ID: **MBLKW**	Batch ID: **34789**					Analysis Date: **12/16/2021**		SeqNo: **1470123**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.200									
1,1-Dichloroethene	ND	0.500									
Surr: Dibromofluoromethane	25.6		25.00		103	80	120				
Surr: Toluene-d8	26.3		25.00		105	80	120				
Surr: 1-Bromo-4-fluorobenzene	25.4		25.00		102	80	120				

Sample ID: **2112259-005ADUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **12/16/2021**		RunNo: **72055**		
Client ID: **BMW-15**	Batch ID: **34789**					Analysis Date: **12/16/2021**		SeqNo: **1470105**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.200						0		30	
1,1-Dichloroethene	ND	0.500						0		30	
Surr: Dibromofluoromethane	25.3		25.00		101	80	120		0		
Surr: Toluene-d8	26.4		25.00		105	80	120		0		
Surr: 1-Bromo-4-fluorobenzene	24.6		25.00		98.5	80	120		0		

Work Order: 2112259
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **2112287-001ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/16/2021** RunNo: **72055**
Client ID: **BATCH** Batch ID: **34789** Analysis Date: **12/16/2021** SeqNo: **1470117**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.200						0		30	
1,1-Dichloroethene	ND	0.500						0		30	
Surr: Dibromofluoromethane	25.2		25.00		101	80	120		0		
Surr: Toluene-d8	26.5		25.00		106	80	120		0		
Surr: 1-Bromo-4-fluorobenzene	24.3		25.00		97.2	80	120		0		

Sample ID: **2112259-005AMS** SampType: **MS** Units: **µg/L** Prep Date: **12/16/2021** RunNo: **72055**
Client ID: **BMW-15** Batch ID: **34789** Analysis Date: **12/16/2021** SeqNo: **1470107**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	20.9	0.200	20.00	0	105	32.8	161				
1,1-Dichloroethene	24.9	0.500	20.00	0	125	76.5	134				
Surr: Dibromofluoromethane	26.8		25.00		107	80	120				
Surr: Toluene-d8	26.6		25.00		106	80	120				
Surr: 1-Bromo-4-fluorobenzene	27.4		25.00		110	80	120				

Sample Log-In Check List

Client Name:	**COBI**	Work Order Number:	**2112259**
Logged by:	**Gabrielle Coeuille**	Date Received:	**12/15/2021 1:08:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐	
2.	How was the sample delivered?	Picked up by FAI			

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐	
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐		
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Present ☑	
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐	
7.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐	
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐		
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐		
10.	Are samples properly preserved?	Yes ☑	No ☐		
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐	
12.	Is there headspace in the VOA vials?	Yes ☐	No ☑	NA ☐	
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐		
14.	Does paperwork match bottle labels?	Yes ☑	No ☐		
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐		
16.	Is it clear what analyses were requested?	Yes ☑	No ☐		
17.	Were all holding times able to be met?	Yes ☑	No ☐		

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑	

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample 1	6.0

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Chain of Custody Record & Laboratory Services Agreement

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: Page: of:

Laboratory Project No (internal): 2112259

Project Name: Vincent Landfill Groundwater

Special Remarks: VOCS: 1,1 - DCE, VC only.

Client: City of Bainbridge Island

Project No: 23826

Address: 7305 NE Hidden Cove Rd

Collected by: Ray Navarette

City, State, Zip: Bainbridge Island, WA 98110

Location: Vincent Landfill

Telephone: 206-780-3585

Report To (PM): Aaron Claiborne

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Fax: 206-780-5104

PM Email: Aclaiborne@bainbridgewa.gov

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	# of Cont.	VOCs (EPA 8260 / 624)	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T)	Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1 BMW-12	12-15-21	6:38	GW	6	X							X	X		X			
2 BMW-13		7:38	GW	6	X							X	X		X			
3 BMW-14		8:35	GW	6	X							X	X		X			
4 BMW-114		8:35	GW	6	X							X	X		X			
5 BMW-15		9:25	GW	8	X							X	X		X			Collect 2 additional VOAs
6 BOW-37		11:10	GW	6	X							X	X		X			
7																		
8																		
9																		
10																		

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:
☒ Standard ☐ Next Day
☐ 3 Day ☐ Same Day
☐ 2 Day (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished (Signature)	Print Name	Date/Time	Received (Signature)	Print Name	Date/Time
x	Ray Navarette	12-15-2021 1:08	x		12/15/21 1:08pm
x Justine Mantz	Justine Mantz	12/15 13:55	x		

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Landfill Surfacewater
Work Order Number: 2112260

December 22, 2021

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 3 sample(s) on 12/15/2021 for the analyses presented in the following report.

Dissolved Metals by EPA Method 200.8
E.coli by m-ColiBlue24® (MF Count)
Fecal Coliform by SM 9222D
Total Metals by EPA Method 200.8
Total Alkalinity by SM 2320B

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *12/22/2021*

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater
Work Order: 2112260

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2112260-001	SWU-1	12/15/2021 10:10 AM	12/15/2021 1:50 PM
2112260-002	SWD-1	12/15/2021 10:35 AM	12/15/2021 1:50 PM
2112260-003	SWD-11 (Dup)	12/15/2021 10:35 AM	12/15/2021 1:50 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2112260**
Date: **12/22/2021**

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry"). Bacteria results are reporting in Colony Forming Units (CFU).

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2112260**
Date Reported: **12/22/2021**

Client: City of Bainbridge Island
Project: Vincent Landfill Surfacewater
Lab ID: 2112260-001
Client Sample ID: **SWU-1**

Collection Date: 12/15/2021 10:10:00 AM
Matrix: Surface Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Fecal Coliform by SM 9222D				Batch ID: R72102		Analyst: TN
Coliform, Fecal	50.0	10.0	D	CFU/100ml	10	12/15/2021 4:34:00 PM
E.coli by m-ColiBlue24® (MF Count)				Batch ID: R72101		Analyst: TN
E. coli	ND	10.0	D	CFU/100ml	10	12/15/2021 4:30:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 34783		Analyst: EH
Copper	ND	2.00		µg/L	1	12/21/2021 2:55:41 PM
Iron	309	100		µg/L	1	12/22/2021 12:14:32 PM
Lead	0.761	0.500		µg/L	1	12/21/2021 2:55:41 PM
Zinc	ND	3.80		µg/L	1	12/21/2021 2:55:41 PM
Total Metals by EPA Method 200.8				Batch ID: 34781		Analyst: EH
Copper	ND	2.00		µg/L	1	12/17/2021 9:31:56 PM
Iron	561	100		µg/L	1	12/20/2021 2:30:15 PM
Lead	0.836	0.500		µg/L	1	12/17/2021 9:31:56 PM
Zinc	2.85	2.50		µg/L	1	12/17/2021 9:31:56 PM
Total Alkalinity by SM 2320B				Batch ID: R71946		Analyst: CH
Alkalinity, Total (As CaCO3)	8.71	2.50		mg/L	1	12/15/2021 12:45:05 PM

Analytical Report

Work Order: **2112260**
Date Reported: **12/22/2021**

Client: City of Bainbridge Island
Project: Vincent Landfill Surfacewater
Lab ID: 2112260-002
Client Sample ID: **SWD-1**

Collection Date: 12/15/2021 10:35:00 AM
Matrix: Surface Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Fecal Coliform by SM 9222D				Batch ID: R72102		Analyst: TN
Coliform, Fecal	60.0	10.0	D	CFU/100ml	10	12/15/2021 4:34:00 PM
E.coli by m-ColiBlue24® (MF Count)				Batch ID: R72101		Analyst: TN
E. coli	30.0	10.0	D	CFU/100ml	10	12/15/2021 4:30:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 34783		Analyst: EH
Copper	ND	2.00		µg/L	1	12/21/2021 2:58:19 PM
Iron	266	100		µg/L	1	12/22/2021 12:17:11 PM
Lead	0.682	0.500		µg/L	1	12/21/2021 2:58:19 PM
Zinc	ND	3.80		µg/L	1	12/21/2021 2:58:19 PM
Total Metals by EPA Method 200.8				Batch ID: 34781		Analyst: EH
Copper	3.76	2.00		µg/L	1	12/17/2021 9:37:29 PM
Iron	703	100		µg/L	1	12/20/2021 2:32:54 PM
Lead	1.02	0.500		µg/L	1	12/17/2021 9:37:29 PM
Zinc	7.79	2.50		µg/L	1	12/17/2021 9:37:29 PM
Total Alkalinity by SM 2320B				Batch ID: R71946		Analyst: CH
Alkalinity, Total (As CaCO3)	12.0	2.50		mg/L	1	12/15/2021 12:45:05 PM

Analytical Report

Work Order: **2112260**
Date Reported: **12/22/2021**

Client: City of Bainbridge Island
Project: Vincent Landfill Surfacewater
Lab ID: 2112260-003
Client Sample ID: SWD-11 (Dup)

Collection Date: 12/15/2021 10:35:00 AM
Matrix: Surface Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Fecal Coliform by SM 9222D				Batch ID: R72102		Analyst: TN
Coliform, Fecal	50.0	10.0	D	CFU/100ml	10	12/15/2021 4:34:00 PM
E.coli by m-ColiBlue24® (MF Count)				Batch ID: R72101		Analyst: TN
E. coli	30.0	10.0	D	CFU/100ml	10	12/15/2021 4:30:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 34783		Analyst: EH
Copper	ND	2.00		µg/L	1	12/21/2021 3:00:58 PM
Iron	269	100		µg/L	1	12/22/2021 12:19:50 PM
Lead	0.854	0.500		µg/L	1	12/21/2021 3:00:58 PM
Zinc	ND	3.80		µg/L	1	12/21/2021 3:00:58 PM
Total Metals by EPA Method 200.8				Batch ID: 34781		Analyst: EH
Copper	3.41	2.00		µg/L	1	12/17/2021 9:43:04 PM
Iron	469	100		µg/L	1	12/20/2021 2:35:32 PM
Lead	0.780	0.500		µg/L	1	12/17/2021 9:43:04 PM
Zinc	5.65	2.50		µg/L	1	12/17/2021 9:43:04 PM
Total Alkalinity by SM 2320B				Batch ID: R71946		Analyst: CH
Alkalinity, Total (As CaCO3)	11.6	2.50		mg/L	1	12/15/2021 12:45:05 PM

Work Order: 2112260
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Fecal Coliform by SM 9222D

Sample ID: **MB1-R72102** SampType: **MBLK** Units: **CFU/100ml** Prep Date: **12/15/2021** RunNo: **72102**
Client ID: **MBLKW** Batch ID: **R72102** Analysis Date: **12/15/2021** SeqNo: **1471179**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Coliform, Fecal	ND	1.00									

Sample ID: **MB2-R72102** SampType: **MBLK** Units: **CFU/100ml** Prep Date: **12/15/2021** RunNo: **72102**
Client ID: **MBLKW** Batch ID: **R72102** Analysis Date: **12/15/2021** SeqNo: **1471183**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Coliform, Fecal	ND	1.00									

Sample ID: **MB3-R72102** SampType: **MBLK** Units: **CFU/100ml** Prep Date: **12/15/2021** RunNo: **72102**
Client ID: **MBLKW** Batch ID: **R72102** Analysis Date: **12/15/2021** SeqNo: **1471185**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Coliform, Fecal	ND	1.00									

Work Order: 2112260
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

E.coli by m-ColiBlue24® (MF Count)

Sample ID: **MB1-R72101**	SampType: **MBLK**	Units: **CFU/100ml**	Prep Date: **12/15/2021**	RunNo: **72101**
Client ID: **MBLKW**	Batch ID: **R72101**		Analysis Date: **12/15/2021**	SeqNo: **1471169**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
E. coli	ND	1.00									

Sample ID: **MB2-R72101**	SampType: **MBLK**	Units: **CFU/100ml**	Prep Date: **12/15/2021**	RunNo: **72101**
Client ID: **MBLKW**	Batch ID: **R72101**		Analysis Date: **12/15/2021**	SeqNo: **1471173**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
E. coli	ND	1.00									

Sample ID: **MB3-R72101**	SampType: **MBLK**	Units: **CFU/100ml**	Prep Date: **12/15/2021**	RunNo: **72101**
Client ID: **MBLKW**	Batch ID: **R72101**		Analysis Date: **12/15/2021**	SeqNo: **1471175**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
E. coli	ND	1.00									

Work Order: 2112260
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: **MB-R71946**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **12/15/2021**		RunNo: **71946**		
Client ID: **MBLKW**	Batch ID: **R71946**					Analysis Date: **12/15/2021**		SeqNo: **1467734**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-R71946**	SampType: **LCS**			Units: **mg/L**		Prep Date: **12/15/2021**		RunNo: **71946**		
Client ID: **LCSW**	Batch ID: **R71946**					Analysis Date: **12/15/2021**		SeqNo: **1467735**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	95.1	2.50	100.0	0	95.1	88.3	113				

Sample ID: **2112224-001EDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/15/2021**		RunNo: **71946**		
Client ID: **BATCH**	Batch ID: **R71946**					Analysis Date: **12/15/2021**		SeqNo: **1467737**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	295	2.50						299.5	1.44	20	

Work Order: 2112260
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-34755FB**	SampType: **MBLK**	Units: **µg/L**	Prep Date: **12/16/2021**	RunNo: **72019**
Client ID: **MBLKW**	Batch ID: **34783**		Analysis Date: **12/16/2021**	SeqNo: **1469222**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	2.00									
Iron	ND	100									
Lead	ND	0.500									
Zinc	ND	3.80									

Sample ID: **MB-34783**	SampType: **MBLK**	Units: **µg/L**	Prep Date: **12/16/2021**	RunNo: **72019**
Client ID: **MBLKW**	Batch ID: **34783**		Analysis Date: **12/16/2021**	SeqNo: **1469223**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	2.00									
Iron	ND	100									
Lead	ND	0.500									
Zinc	ND	3.80									

Sample ID: **LCS-34783**	SampType: **LCS**	Units: **µg/L**	Prep Date: **12/16/2021**	RunNo: **72019**
Client ID: **LCSW**	Batch ID: **34783**		Analysis Date: **12/16/2021**	SeqNo: **1469224**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	555	2.00	500.0	0	111	85	115				
Iron	5,130	100	5,000	0	103	85	115				
Lead	264	0.500	250.0	0	106	85	115				
Zinc	574	3.80	500.0	0	115	85	115				

Sample ID: **2112195-002DDUP**	SampType: **DUP**	Units: **µg/L**	Prep Date: **12/16/2021**	RunNo: **72019**
Client ID: **BATCH**	Batch ID: **34783**		Analysis Date: **12/16/2021**	SeqNo: **1469226**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	2.00						0		30	
Iron	ND	100						0		30	

Work Order: 2112260
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **2112195-002DDUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **12/16/2021**		RunNo: **72019**			
Client ID: **BATCH**	Batch ID: **34783**					Analysis Date: **12/16/2021**		SeqNo: **1469226**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.500						0		30	
Zinc	27.5	3.80						31.02	12.0	30	

Sample ID: **2112195-002DMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **12/16/2021**		RunNo: **72019**			
Client ID: **BATCH**	Batch ID: **34783**					Analysis Date: **12/16/2021**		SeqNo: **1469227**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	512	2.00	500.0	1.216	102	70	130				
Iron	4,890	100	5,000	0	97.8	50	150				
Lead	258	0.500	250.0	0	103	70	130				
Zinc	550	3.80	500.0	31.02	104	70	130				

Sample ID: **2112195-002DMSD**	SampType: **MSD**			Units: **µg/L**		Prep Date: **12/16/2021**		RunNo: **72019**			
Client ID: **BATCH**	Batch ID: **34783**					Analysis Date: **12/16/2021**		SeqNo: **1469228**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	535	2.00	500.0	1.216	107	70	130	511.6	4.53	30	
Iron	4,950	100	5,000	0	99.0	50	150	4,891	1.21	30	
Lead	274	0.500	250.0	0	110	70	130	258.0	5.92	30	
Zinc	597	3.80	500.0	31.02	113	70	130	550.4	8.13	30	

Sample ID: **MB-34782FB**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/16/2021**		RunNo: **72019**			
Client ID: **MBLKW**	Batch ID: **34783**					Analysis Date: **12/21/2021**		SeqNo: **1471653**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	2.00									Q
Iron	ND	100									
Lead	ND	0.500									
Zinc	ND	3.80									

Work Order: 2112260
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-34782FB**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/16/2021**		RunNo: **72019**			
Client ID: **MBLKW**	Batch ID: **34783**					Analysis Date: **12/21/2021**		SeqNo: **1471653**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:
Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Work Order: 2112260
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **MB-34781**	SampType: **MBLK**	Units: **µg/L**	Prep Date: **12/16/2021**	RunNo: **72072**
Client ID: **MBLKW**	Batch ID: **34781**		Analysis Date: **12/17/2021**	SeqNo: **1470335**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	2.00									
Iron	ND	100									
Lead	ND	0.500									
Zinc	ND	2.50									

Sample ID: **LCS-34781**	SampType: **LCS**	Units: **µg/L**	Prep Date: **12/16/2021**	RunNo: **72072**
Client ID: **LCSW**	Batch ID: **34781**		Analysis Date: **12/17/2021**	SeqNo: **1470336**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	110	2.00	100.0	0	110	85	115				
Iron	1,080	100	1,000	0	108	85	115				
Lead	50.2	0.500	50.00	0	100	85	115				
Zinc	103	2.50	100.0	0	103	85	115				

Sample ID: **2112244-001ADUP**	SampType: **DUP**	Units: **µg/L**	Prep Date: **12/16/2021**	RunNo: **72072**
Client ID: **BATCH**	Batch ID: **34781**		Analysis Date: **12/17/2021**	SeqNo: **1470338**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	9.83	2.00						8.811	10.9	30	
Iron	662	100						564.8	15.9	30	
Lead	0.550	0.500						0.5039	8.78	30	
Zinc	86.4	2.50						85.63	0.877	30	

Sample ID: **2112244-001AMS**	SampType: **MS**	Units: **µg/L**	Prep Date: **12/16/2021**	RunNo: **72072**
Client ID: **BATCH**	Batch ID: **34781**		Analysis Date: **12/17/2021**	SeqNo: **1470339**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	122	2.00	100.0	8.811	113	70	130				
Iron	1,820	100	1,000	564.8	126	50	150				

Work Order: 2112260
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **2112244-001AMS** SampType: **MS** Units: **µg/L** Prep Date: **12/16/2021** RunNo: **72072**
Client ID: **BATCH** Batch ID: **34781** Analysis Date: **12/17/2021** SeqNo: **1470339**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	52.9	0.500	50.00	0.5039	105	70	130				
Zinc	194	2.50	100.0	85.63	109	70	130				

Sample Log-In Check List

Client Name:	**COBI**	Work Order Number:	**2112260**
Logged by:	**Clare Griggs**	Date Received:	**12/15/2021 1:50:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes	☑	No	☐	Not Present ☐
2.	How was the sample delivered?	Picked up by FAI				

Log In

3.	Coolers are present?	Yes	☑	No	☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes	☑	No	☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes	☐	No	☐	Not Present ☑
6.	Was an attempt made to cool the samples?	Yes	☑	No	☐	NA ☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes	☑	No	☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes	☑	No	☐	
9.	Sufficient sample volume for indicated test(s)?	Yes	☑	No	☐	
10.	Are samples properly preserved?	Yes	☑	No	☐	
11.	Was preservative added to bottles?	Yes	☐	No	☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes	☐	No	☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes	☑	No	☐	
14.	Does paperwork match bottle labels?	Yes	☑	No	☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes	☑	No	☐	
16.	Is it clear what analyses were requested?	Yes	☑	No	☐	
17.	Were all holding times able to be met?	Yes	☑	No	☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes	☐	No	☐	NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample	6.0

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Chain of Custody Record & Laboratory Services Agreement

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: | Page: 1 of: 1 | Laboratory Project No (internal): 2112560

Project Name: Vincent Landfill Surfacewater | Special Remarks:

Client: City of Bainbridge Island

Project No: 23826

Address: 7305 NE Hidden Cove Rd

Collected by: Ray Navarette

City, State, Zip: Bainbridge Island, WA 98110

Location: Vincent Landfill

Telephone: 206-780-3585

Report To (PM): Aaron Claiborne | Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Fax: 206-780-5104

PM Email: Aclaiborne@bainbridgewa.gov

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	# of Cont.	VOCs (EPA 8260 / 624)	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T)	Dissolved (D)	Anions (IC)***	EDB (8011)	Alkalinity	E. coli	Fecal	Comments
1 SWU-1	12-15-21	10:10	SW	5								X						X	X	X	unable to filter grab samples
2 SWD-1	↓	10:35	SW	5								X						X	X	X	" "
3 SWD-11 (Dup)	↓	10:35	SW	5								X						X	X	X	" "
4																					
5																					
6																					
7																					
8																					
9																					
10																					

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:
☒ Standard ☐ Next Day
☐ 3 Day ☐ Same Day
☐ 2 Day ☐ (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished (Signature)	Print Name	Date/Time	Received (Signature)	Print Name	Date/Time
x	Ray Navarette	12-15-2021 1:08	x		12/15/21 1.08pm
x Justine Mantz	Justine Mantz	12/15 13:50			

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Landfill Groundwater
Work Order Number: 2206151

June 21, 2022

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 6 sample(s) on 6/8/2022 for the analyses presented in the following report.

Dissolved Metals by EPA Method 200.8
Ion Chromatography by EPA Method 300.0
Total Metals by EPA Method 200.8
Volatile Organic Compounds by EPA Method 8260D

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *06/21/2022*

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Work Order: 2206151

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2206151-001	BMW-12	06/08/2022 6:15 AM	06/08/2022 12:12 PM
2206151-002	BMW-13	06/08/2022 7:10 AM	06/08/2022 12:12 PM
2206151-003	BMW-14	06/08/2022 8:15 AM	06/08/2022 12:12 PM
2206151-004	BMW-114	06/08/2022 8:15 AM	06/08/2022 12:12 PM
2206151-005	BMW-15	06/08/2022 9:10 AM	06/08/2022 12:12 PM
2206151-006	BOW-37	06/08/2022 9:55 AM	06/08/2022 12:12 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2206151**
Date: **6/21/2022**

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2206151**
Date Reported: **6/21/2022**

Client: City of Bainbridge Island
Collection Date: 6/8/2022 6:15:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2206151-001
Matrix: Groundwater
Client Sample ID: BMW-12

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 36763		Analyst: MVB
Vinyl chloride	ND	0.200		µg/L	1	6/10/2022 11:15:11 PM
1,1-Dichloroethene	ND	0.500		µg/L	1	6/10/2022 11:15:11 PM
Surr: Dibromofluoromethane	106	80 - 120		%Rec	1	6/10/2022 11:15:11 PM
Surr: Toluene-d8	100	80 - 120		%Rec	1	6/10/2022 11:15:11 PM
Surr: 1-Bromo-4-fluorobenzene	96.2	80 - 120		%Rec	1	6/10/2022 11:15:11 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 36788		Analyst: ALT
Chloride	31.6	2.00	D	mg/L	20	6/13/2022 8:09:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	6/8/2022 9:35:00 PM
Nitrate (as N)	2.20	0.500	D	mg/L	5	6/9/2022 7:09:00 PM
Sulfate	8.88	3.00	D	mg/L	5	6/13/2022 7:46:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 36760		Analyst: EH
Calcium	17,700	525		µg/L	1	6/17/2022 7:42:13 PM
Iron	ND	100		µg/L	1	6/17/2022 7:42:13 PM
Magnesium	13,200	100		µg/L	1	6/17/2022 7:42:13 PM
Manganese	ND	1.80		µg/L	1	6/17/2022 7:42:13 PM
Potassium	1,240	200		µg/L	1	6/17/2022 7:42:13 PM
Sodium	8,240	250		µg/L	1	6/21/2022 1:52:15 AM
Total Metals by EPA Method 200.8				Batch ID: 36758		Analyst: EH
Calcium	20,500	4,000	D	µg/L	20	6/20/2022 11:49:43 PM
Iron	ND	100		µg/L	1	6/17/2022 4:32:48 PM
Magnesium	14,500	2,000	D	µg/L	20	6/20/2022 11:49:43 PM
Manganese	ND	5.00		µg/L	1	6/17/2022 4:32:48 PM
Potassium	1,200	200		µg/L	1	6/17/2022 4:32:48 PM
Sodium	9,130	4,000	D	µg/L	20	6/20/2022 11:49:43 PM

Analytical Report

Work Order: **2206151**
Date Reported: **6/21/2022**

Client: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Lab ID: 2206151-002
Client Sample ID: **BMW-13**

Collection Date: 6/8/2022 7:10:00 AM
Matrix: Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 36763		Analyst: MVB
Vinyl chloride	ND	0.200		µg/L	1	6/10/2022 11:46:33 PM
1,1-Dichloroethene	ND	0.500		µg/L	1	6/10/2022 11:46:33 PM
Surr: Dibromofluoromethane	105	80 - 120		%Rec	1	6/10/2022 11:46:33 PM
Surr: Toluene-d8	99.9	80 - 120		%Rec	1	6/10/2022 11:46:33 PM
Surr: 1-Bromo-4-fluorobenzene	94.9	80 - 120		%Rec	1	6/10/2022 11:46:33 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 36788		Analyst: ALT
Chloride	7.80	0.500	D	mg/L	5	6/13/2022 8:32:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	6/8/2022 9:58:00 PM
Nitrate (as N)	0.231	0.100		mg/L	1	6/8/2022 9:58:00 PM
Sulfate	17.1	3.00	D	mg/L	5	6/13/2022 8:32:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 36760		Analyst: EH
Calcium	69,500	5,250	D	µg/L	10	6/21/2022 1:57:50 AM
Iron	ND	100		µg/L	1	6/17/2022 7:47:46 PM
Magnesium	58,600	1,000	D	µg/L	10	6/21/2022 1:57:50 AM
Manganese	4,530	18.0	D	µg/L	10	6/21/2022 1:57:50 AM
Potassium	2,390	200		µg/L	1	6/17/2022 7:47:46 PM
Sodium	16,600	2,500	D	µg/L	10	6/21/2022 1:57:50 AM
Total Metals by EPA Method 200.8				Batch ID: 36758		Analyst: EH
Calcium	69,600	4,000	D	µg/L	20	6/20/2022 11:55:17 PM
Iron	ND	100		µg/L	1	6/17/2022 4:38:22 PM
Magnesium	60,200	2,000	D	µg/L	20	6/20/2022 11:55:17 PM
Manganese	4,460	100	D	µg/L	20	6/20/2022 11:55:17 PM
Potassium	2,300	200		µg/L	1	6/17/2022 4:38:22 PM
Sodium	16,900	4,000	D	µg/L	20	6/20/2022 11:55:17 PM

Analytical Report

Work Order: **2206151**
Date Reported: **6/21/2022**

Client: City of Bainbridge Island
Collection Date: 6/8/2022 8:15:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2206151-003
Matrix: Groundwater
Client Sample ID: BMW-14

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 36763		Analyst: MVB
Vinyl chloride	ND	0.200		µg/L	1	6/11/2022 12:17:47 AM
1,1-Dichloroethene	ND	0.500		µg/L	1	6/11/2022 12:17:47 AM
Surr: Dibromofluoromethane	104	80 - 120		%Rec	1	6/11/2022 12:17:47 AM
Surr: Toluene-d8	100	80 - 120		%Rec	1	6/11/2022 12:17:47 AM
Surr: 1-Bromo-4-fluorobenzene	94.9	80 - 120		%Rec	1	6/11/2022 12:17:47 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 36788		Analyst: ALT
Chloride	6.14	0.500	D	mg/L	5	6/13/2022 10:05:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	6/8/2022 10:21:00 PM
Nitrate (as N)	0.392	0.100		mg/L	1	6/8/2022 10:21:00 PM
Sulfate	16.9	3.00	D	mg/L	5	6/13/2022 10:05:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 36760		Analyst: EH
Calcium	52,800	5,250	D	µg/L	10	6/21/2022 2:03:23 AM
Iron	ND	100		µg/L	1	6/17/2022 7:53:20 PM
Magnesium	45,600	1,000	D	µg/L	10	6/21/2022 2:03:23 AM
Manganese	35.7	1.80		µg/L	1	6/17/2022 7:53:20 PM
Potassium	3,010	200		µg/L	1	6/17/2022 7:53:20 PM
Sodium	24,700	2,500	D	µg/L	10	6/21/2022 2:03:23 AM
Total Metals by EPA Method 200.8				Batch ID: 36758		Analyst: EH
Calcium	48,800	4,000	D	µg/L	20	6/20/2022 11:44:09 PM
Iron	ND	100		µg/L	1	6/17/2022 4:16:07 PM
Magnesium	47,600	2,000	D	µg/L	20	6/20/2022 11:44:09 PM
Manganese	31.7	5.00		µg/L	1	6/17/2022 4:16:07 PM
Potassium	2,860	200		µg/L	1	6/17/2022 4:16:07 PM
Sodium	25,800	4,000	D	µg/L	20	6/20/2022 11:44:09 PM

Analytical Report

Work Order: **2206151**
Date Reported: **6/21/2022**

Client: City of Bainbridge Island
Collection Date: 6/8/2022 8:15:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2206151-004
Matrix: Groundwater
Client Sample ID: BMW-114

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 36763		Analyst: MVB
Vinyl chloride	ND	0.200		µg/L	1	6/11/2022 12:49:01 AM
1,1-Dichloroethene	ND	0.500		µg/L	1	6/11/2022 12:49:01 AM
Surr: Dibromofluoromethane	106	80 - 120		%Rec	1	6/11/2022 12:49:01 AM
Surr: Toluene-d8	100	80 - 120		%Rec	1	6/11/2022 12:49:01 AM
Surr: 1-Bromo-4-fluorobenzene	95.4	80 - 120		%Rec	1	6/11/2022 12:49:01 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 36788		Analyst: ALT
Chloride	5.99	0.500	D	mg/L	5	6/13/2022 10:28:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	6/8/2022 10:44:00 PM
Nitrate (as N)	0.404	0.100		mg/L	1	6/8/2022 10:44:00 PM
Sulfate	16.3	3.00	D	mg/L	5	6/13/2022 10:28:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 36760		Analyst: EH
Calcium	51,600	5,250	D	µg/L	10	6/21/2022 2:08:57 AM
Iron	ND	100		µg/L	1	6/17/2022 7:58:55 PM
Magnesium	45,900	1,000	D	µg/L	10	6/21/2022 2:08:57 AM
Manganese	32.4	1.80		µg/L	1	6/17/2022 7:58:55 PM
Potassium	2,980	200		µg/L	1	6/17/2022 7:58:55 PM
Sodium	24,300	2,500	D	µg/L	10	6/21/2022 2:08:57 AM
Total Metals by EPA Method 200.8				Batch ID: 36758		Analyst: EH
Calcium	50,200	4,000	D	µg/L	20	6/21/2022 12:00:51 AM
Iron	ND	100		µg/L	1	6/17/2022 4:43:56 PM
Magnesium	47,500	2,000	D	µg/L	20	6/21/2022 12:00:51 AM
Manganese	30.2	5.00		µg/L	1	6/17/2022 4:43:56 PM
Potassium	2,720	200		µg/L	1	6/17/2022 4:43:56 PM
Sodium	25,400	4,000	D	µg/L	20	6/21/2022 12:00:51 AM

Analytical Report

Work Order: **2206151**
Date Reported: **6/21/2022**

Client: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Lab ID: 2206151-005
Client Sample ID: **BMW-15**

Collection Date: 6/8/2022 9:10:00 AM
Matrix: Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 36763		Analyst: MVB
Vinyl chloride	ND	0.200		µg/L	1	6/11/2022 1:20:18 AM
1,1-Dichloroethene	ND	0.500		µg/L	1	6/11/2022 1:20:18 AM
Surr: Dibromofluoromethane	105	80 - 120		%Rec	1	6/11/2022 1:20:18 AM
Surr: Toluene-d8	100	80 - 120		%Rec	1	6/11/2022 1:20:18 AM
Surr: 1-Bromo-4-fluorobenzene	95.0	80 - 120		%Rec	1	6/11/2022 1:20:18 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 36788		Analyst: ALT
Chloride	24.4	2.00	D	mg/L	20	6/13/2022 10:51:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	6/8/2022 11:07:00 PM
Nitrate (as N)	3.80	1.00	D	mg/L	10	6/9/2022 7:32:00 PM
Sulfate	42.4	12.0	D	mg/L	20	6/13/2022 10:51:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 36760		Analyst: EH
Calcium	58,100	5,250	D	µg/L	10	6/21/2022 2:14:31 AM
Iron	ND	100		µg/L	1	6/17/2022 8:04:29 PM
Magnesium	40,400	1,000	D	µg/L	10	6/21/2022 2:14:31 AM
Manganese	ND	1.80		µg/L	1	6/17/2022 8:04:29 PM
Potassium	2,670	200		µg/L	1	6/17/2022 8:04:29 PM
Sodium	36,200	2,500	D	µg/L	10	6/21/2022 2:14:31 AM
Total Metals by EPA Method 200.8				Batch ID: 36758		Analyst: EH
Calcium	56,800	4,000	D	µg/L	20	6/21/2022 12:06:25 AM
Iron	ND	100		µg/L	1	6/17/2022 4:49:30 PM
Magnesium	42,000	2,000	D	µg/L	20	6/21/2022 12:06:25 AM
Manganese	ND	5.00		µg/L	1	6/17/2022 4:49:30 PM
Potassium	2,610	200		µg/L	1	6/17/2022 4:49:30 PM
Sodium	35,600	4,000	D	µg/L	20	6/21/2022 12:06:25 AM

Analytical Report

Work Order: **2206151**
Date Reported: **6/21/2022**

Client: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Lab ID: 2206151-006
Client Sample ID: **BOW-37**

Collection Date: 6/8/2022 9:55:00 AM
Matrix: Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 36763		Analyst: MVB
Vinyl chloride	ND	0.200		µg/L	1	6/11/2022 1:51:34 AM
1,1-Dichloroethene	ND	0.500		µg/L	1	6/11/2022 1:51:34 AM
Surr: Dibromofluoromethane	105	80 - 120		%Rec	1	6/11/2022 1:51:34 AM
Surr: Toluene-d8	101	80 - 120		%Rec	1	6/11/2022 1:51:34 AM
Surr: 1-Bromo-4-fluorobenzene	94.7	80 - 120		%Rec	1	6/11/2022 1:51:34 AM
Ion Chromatography by EPA Method 300.0				Batch ID: 36788		Analyst: ALT
Chloride	6.04	0.500	D	mg/L	5	6/13/2022 11:15:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	6/8/2022 11:30:00 PM
Nitrate (as N)	1.58	0.100		mg/L	1	6/8/2022 11:30:00 PM
Sulfate	7.66	3.00	D	mg/L	5	6/13/2022 11:15:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 36760		Analyst: EH
Calcium	18,800	525		µg/L	1	6/17/2022 8:10:03 PM
Iron	ND	100		µg/L	1	6/17/2022 8:10:03 PM
Magnesium	14,800	100		µg/L	1	6/17/2022 8:10:03 PM
Manganese	2.53	1.80		µg/L	1	6/17/2022 8:10:03 PM
Potassium	1,860	200		µg/L	1	6/17/2022 8:10:03 PM
Sodium	13,800	2,500	D	µg/L	10	6/21/2022 2:20:05 AM
Total Metals by EPA Method 200.8				Batch ID: 36758		Analyst: EH
Calcium	20,600	4,000	D	µg/L	20	6/21/2022 12:11:59 AM
Iron	ND	100		µg/L	1	6/17/2022 4:55:04 PM
Magnesium	16,000	2,000	D	µg/L	20	6/21/2022 12:11:59 AM
Manganese	ND	5.00		µg/L	1	6/17/2022 4:55:04 PM
Potassium	1,810	200		µg/L	1	6/17/2022 4:55:04 PM
Sodium	14,300	4,000	D	µg/L	20	6/21/2022 12:11:59 AM

Work Order: 2206151
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **MB-36745A**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **6/8/2022**	RunNo: **76132**
Client ID: **MBLKW**	Batch ID: **36745**		Analysis Date: **6/8/2022**	SeqNo: **1561479**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	ND	0.100									
Nitrate (as N)	ND	0.100									

Sample ID: **LCS-36745**	SampType: **LCS**	Units: **mg/L**	Prep Date: **6/8/2022**	RunNo: **76132**
Client ID: **LCSW**	Batch ID: **36745**		Analysis Date: **6/8/2022**	SeqNo: **1561480**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	0.721	0.100	0.7500	0	96.1	90	110				
Nitrate (as N)	0.725	0.100	0.7500	0	96.7	90	110				

Sample ID: **2206133-001BDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **6/8/2022**	RunNo: **76132**
Client ID: **BATCH**	Batch ID: **36745**		Analysis Date: **6/8/2022**	SeqNo: **1561486**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	ND	1.00						0		20	D
Nitrate (as N)	2.54	1.00						2.550	0.393	20	D

Sample ID: **2206133-001BMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **6/8/2022**	RunNo: **76132**
Client ID: **BATCH**	Batch ID: **36745**		Analysis Date: **6/8/2022**	SeqNo: **1561487**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	6.61	1.00	7.500	0	88.1	80	120				D
Nitrate (as N)	9.47	1.00	7.500	2.550	92.3	80	120				D

Sample ID: **2206133-001BMSD**	SampType: **MSD**	Units: **mg/L**	Prep Date: **6/8/2022**	RunNo: **76132**
Client ID: **BATCH**	Batch ID: **36745**		Analysis Date: **6/8/2022**	SeqNo: **1561488**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	6.77	1.00	7.500	0	90.3	80	120	6.610	2.39	20	D
Nitrate (as N)	9.46	1.00	7.500	2.550	92.1	80	120	9.470	0.106	20	D

Work Order: 2206151
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **2206133-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **6/8/2022** RunNo: **76132**
Client ID: **BATCH** Batch ID: **36745** Analysis Date: **6/8/2022** SeqNo: **1561488**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **LCS-36788** SampType: **LCS** Units: **mg/L** Prep Date: **6/13/2022** RunNo: **76167**
Client ID: **LCSW** Batch ID: **36788** Analysis Date: **6/13/2022** SeqNo: **1562691**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.713	0.100	0.7500	0	95.1	90	110				
Sulfate	3.44	0.600	3.750	0	91.7	90	110				

Sample ID: **MB-36788** SampType: **MBLK** Units: **mg/L** Prep Date: **6/13/2022** RunNo: **76167**
Client ID: **MBLKW** Batch ID: **36788** Analysis Date: **6/13/2022** SeqNo: **1562693**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									
Sulfate	ND	0.600									

Sample ID: **2206151-002DDUP** SampType: **DUP** Units: **mg/L** Prep Date: **6/13/2022** RunNo: **76167**
Client ID: **BMW-13** Batch ID: **36788** Analysis Date: **6/13/2022** SeqNo: **1562697**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	7.88	0.500						7.795	1.02	20	D
Sulfate	17.3	3.00						17.12	1.13	20	D

Sample ID: **2206151-002DMS** SampType: **MS** Units: **mg/L** Prep Date: **6/13/2022** RunNo: **76167**
Client ID: **BMW-13** Batch ID: **36788** Analysis Date: **6/13/2022** SeqNo: **1562698**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	8.19	0.500	0.3750	7.795	105	80	120				D
Sulfate	18.9	3.00	1.875	17.12	96.3	80	120				D

Work Order: 2206151
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **2206151-002DMSD** SampType: **MSD** Units: **mg/L** Prep Date: **6/13/2022** RunNo: **76167**
Client ID: **BMW-13** Batch ID: **36788** Analysis Date: **6/13/2022** SeqNo: **1562699**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	8.22	0.500	0.3750	7.795	113	80	120	8.190	0.366	20	D
Sulfate	19.0	3.00	1.875	17.12	101	80	120	18.93	0.448	20	D

Work Order: 2206151
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-36759FB** SampType: **MBLK** Units: **µg/L** Prep Date: **6/10/2022** RunNo: **76256**
Client ID: **MBLKW** Batch ID: **36760** Analysis Date: **6/17/2022** SeqNo: **1564471**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	525									
Iron	ND	100									
Magnesium	ND	100									Q
Manganese	ND	1.80									
Potassium	ND	200									
Sodium	ND	250									

NOTES:
Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: **MB-36760** SampType: **MBLK** Units: **µg/L** Prep Date: **6/10/2022** RunNo: **76256**
Client ID: **MBLKW** Batch ID: **36760** Analysis Date: **6/17/2022** SeqNo: **1564472**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	525									
Iron	ND	100									
Magnesium	ND	100									Q
Manganese	ND	1.80									
Potassium	ND	200									
Sodium	ND	250									

NOTES:
Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: **LCS-36760** SampType: **LCS** Units: **µg/L** Prep Date: **6/10/2022** RunNo: **76256**
Client ID: **LCSW** Batch ID: **36760** Analysis Date: **6/17/2022** SeqNo: **1564473**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	5,680	525	5,000	0	114	85	115				
Iron	4,750	100	5,000	0	95.1	85	115				
Magnesium	4,790	100	5,000	0	95.8	85	115				
Manganese	519	1.80	500.0	0	104	85	115				
Potassium	5,340	200	5,000	0	107	85	115				
Sodium	5,750	250	5,000	0	115	85	115				

Work Order: 2206151
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **2206146-003CDUP** SampType: **DUP** Units: **µg/L** Prep Date: **6/10/2022** RunNo: **76256**
Client ID: **BATCH** Batch ID: **36760** Analysis Date: **6/17/2022** SeqNo: **1564475**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	44,700	525						45,160	1.04	30	E
Iron	ND	100						0		30	
Magnesium	14,500	100						14,550	0.118	30	Q
Manganese	ND	1.80						0		30	
Potassium	4,060	200						4,047	0.252	30	
Sodium	14,900	250						14,590	2.38	30	

NOTES:
Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: **2206146-003CMS** SampType: **MS** Units: **µg/L** Prep Date: **6/10/2022** RunNo: **76256**
Client ID: **BATCH** Batch ID: **36760** Analysis Date: **6/17/2022** SeqNo: **1564476**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	49,800	525	5,000	45,160	92.1	50	150				E
Iron	4,740	100	5,000	15.63	94.5	50	150				
Magnesium	18,600	100	5,000	14,550	81.4	70	130				
Manganese	510	1.80	500.0	1.159	102	70	130				
Potassium	9,610	200	5,000	4,047	111	50	150				
Sodium	19,600	250	5,000	14,590	99.1	50	150				

Sample ID: **2206160-005CMS** SampType: **MS** Units: **µg/L** Prep Date: **6/10/2022** RunNo: **76256**
Client ID: **BATCH** Batch ID: **36760** Analysis Date: **6/17/2022** SeqNo: **1564494**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	5,600	525	5,000	0	112	50	150				
Iron	4,740	100	5,000	0	94.8	50	150				
Magnesium	4,790	100	5,000	0	95.7	70	130				
Manganese	544	1.80	500.0	0	109	70	130				
Potassium	5,720	200	5,000	0	114	50	150				
Sodium	6,060	250	5,000	0	121	50	150				

Work Order: 2206151
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **MB-36758**	SampType: **MBLK**	Units: **µg/L**	Prep Date: **6/10/2022**	RunNo: **76254**
Client ID: **MBLKW**	Batch ID: **36758**		Analysis Date: **6/17/2022**	SeqNo: **1564391**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	200									
Iron	ND	100									
Magnesium	ND	100									
Manganese	ND	5.00									
Potassium	ND	200									
Sodium	ND	200									

Sample ID: **LCS-36758**	SampType: **LCS**	Units: **µg/L**	Prep Date: **6/10/2022**	RunNo: **76254**
Client ID: **LCSW**	Batch ID: **36758**		Analysis Date: **6/17/2022**	SeqNo: **1564392**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	1,090	200	1,000	0	109	85	115				
Iron	953	100	1,000	0	95.3	85	115				
Magnesium	962	100	1,000	0	96.2	85	115				
Manganese	95.7	5.00	100.0	0	95.7	85	115				
Potassium	975	200	1,000	0	97.5	85	115				
Sodium	1,130	200	1,000	0	113	85	115				

Sample ID: **2206151-003BDUP**	SampType: **DUP**	Units: **µg/L**	Prep Date: **6/10/2022**	RunNo: **76254**
Client ID: **BMW-14**	Batch ID: **36758**		Analysis Date: **6/17/2022**	SeqNo: **1564394**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	50,500	200						50,370	0.250	30	E
Iron	ND	100						0		30	
Magnesium	47,000	100						49,250	4.60	30	E
Manganese	30.8	5.00						31.66	2.82	30	
Potassium	2,840	200						2,859	0.817	30	
Sodium	38,900	200						39,470	1.38	30	E

Work Order: 2206151
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **2206151-003BMS** SampType: **MS** Units: **µg/L** Prep Date: **6/10/2022** RunNo: **76254**
Client ID: **BMW-14** Batch ID: **36758** Analysis Date: **6/17/2022** SeqNo: **1564395**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	51,700	200	1,000	50,370	132	50	150				E
Iron	1,050	100	1,000	18.67	103	50	150				
Magnesium	49,700	100	1,000	49,250	43.4	70	130				ES
Manganese	138	5.00	100.0	31.66	106	70	130				
Potassium	3,930	200	1,000	2,859	108	50	150				
Sodium	40,600	200	1,000	39,470	113	50	150				E

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2206160-005BMS** SampType: **MS** Units: **µg/L** Prep Date: **6/10/2022** RunNo: **76254**
Client ID: **BATCH** Batch ID: **36758** Analysis Date: **6/17/2022** SeqNo: **1564408**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	1,060	200	1,000	0	106	50	150				
Iron	945	100	1,000	0	94.5	50	150				
Magnesium	878	100	1,000	0	87.8	70	130				
Manganese	96.5	5.00	100.0	0	96.5	70	130				
Potassium	995	200	1,000	14.76	98.1	50	150				
Sodium	1,120	200	1,000	0	112	50	150				

Work Order: 2206151
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **LCS-36763** SampType: **LCS** Units: **µg/L** Prep Date: **6/10/2022** RunNo: **76086**
Client ID: **LCSW** Batch ID: **36763** Analysis Date: **6/10/2022** SeqNo: **1560138**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	21.0	0.200	20.00	0	105	80	120				
1,1-Dichloroethene	19.1	0.500	20.00	0	95.7	80	120				
Surr: Dibromofluoromethane	24.0		25.00		95.8	80	120				
Surr: Toluene-d8	24.7		25.00		98.9	80	120				
Surr: 1-Bromo-4-fluorobenzene	25.6		25.00		102	80	120				

Sample ID: **MB-36763** SampType: **MBLK** Units: **µg/L** Prep Date: **6/10/2022** RunNo: **76086**
Client ID: **MBLKW** Batch ID: **36763** Analysis Date: **6/10/2022** SeqNo: **1560137**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.200									
1,1-Dichloroethene	ND	0.500									
Surr: Dibromofluoromethane	24.9		25.00		99.5	80	120				
Surr: Toluene-d8	25.9		25.00		103	80	120				
Surr: 1-Bromo-4-fluorobenzene	24.3		25.00		97.2	80	120				

Sample ID: **2206174-001ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **6/10/2022** RunNo: **76086**
Client ID: **BATCH** Batch ID: **36763** Analysis Date: **6/10/2022** SeqNo: **1560128**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.200						0		30	
1,1-Dichloroethene	ND	0.500						0		30	
Surr: Dibromofluoromethane	25.0		25.00		100	80	120		0		
Surr: Toluene-d8	24.6		25.00		98.4	80	120		0		
Surr: 1-Bromo-4-fluorobenzene	24.3		25.00		97.3	80	120		0		

Work Order: 2206151
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **2206151-005AMS** SampType: **MS** Units: **µg/L** Prep Date: **6/10/2022** RunNo: **76086**
Client ID: **BMW-15** Batch ID: **36763** Analysis Date: **6/11/2022** SeqNo: **1560119**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	23.9	0.200	20.00	0	120	52.3	147				
1,1-Dichloroethene	21.7	0.500	20.00	0	109	76.5	136				
Surr: Dibromofluoromethane	27.0		25.00		108	80	120				
Surr: Toluene-d8	26.3		25.00		105	80	120				
Surr: 1-Bromo-4-fluorobenzene	25.7		25.00		103	80	120				

Sample Log-In Check List

Client Name:	COBI	Work Order Number:	2206151
Logged by:	Gabrielle Coeuille	Date Received:	6/8/2022 12:12:00 PM

Chain of Custody

1.	Is Chain of Custody complete?	Yes	☑	No	☐	Not Present ☐
2.	How was the sample delivered?	fai				

Log In

3.	Coolers are present?	Yes	☑	No	☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes	☑	No	☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes	☐	No	☐	Not Present ☑
6.	Was an attempt made to cool the samples?	Yes	☑	No	☐	NA ☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes	☐	No	☑	NA ☐
	Samples were collected the same day and chilled.					
8.	Sample(s) in proper container(s)?	Yes	☑	No	☐	
9.	Sufficient sample volume for indicated test(s)?	Yes	☑	No	☐	
10.	Are samples properly preserved?	Yes	☑	No	☐	
11.	Was preservative added to bottles?	Yes	☐	No	☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes	☐	No	☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes	☑	No	☐	
14.	Does paperwork match bottle labels?	Yes	☑	No	☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes	☑	No	☐	
16.	Is it clear what analyses were requested?	Yes	☑	No	☐	
17.	Were all holding times able to be met?	Yes	☑	No	☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes	☐	No	☐	NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample 1	12.0

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Chain of Custody Record & Laboratory Services Agreement

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: 6-8-2022 Page: 1 of: 1

Laboratory Project No (internal): 2206151

Project Name: Vincent Landfill Groundwater

Special Remarks: VOCS: 1,1 - DCE, VC only.

Client: City of Bainbridge Island

Project No: 23826

Address: 7305 NE Hidden Cove Rd

Collected by: Ray Navarette

City, State, Zip: Bainbridge Island, WA 98110

Location: Vincent Landfill

Telephone: 206-780-3585

Report To (PM): Aaron Claiborne

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Fax: 206-780-5104

PM Email: Aclaiborne@bainbridgewa.gov

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	# of Cont.	VOCs (EPA 8260 / 624)	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	(total (T) / Dissolved (D))	Anions (IC)***	EDB (8011)	Comments
1	BMW-12	6-8-22	6:15	GW	6	X							X		X			
2	BMW-13	↓	7:10	GW	6	X							X		X			
3	BMW-14		8:15	GW	6	X							X		X			
4	BMW-114		8:15	GW	6	X							X		X			
5	BMW-15		9:10	GW	8	X							X		X			Collect 2 additional VOAs
6	BOW-37	↓	9:55	GW	6	X							X		X			
7																		
8																		
9																		
10																		

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:
☒ Standard ☐ Next Day
☐ 3 Day ☐ Same Day
☐ 2 Day (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished (Signature)	Print Name	Date/Time	Received (Signature)	Print Name	Date/Time
x	Ray Navarette	6-8-2022 12:12	x		6/8/22 12:12
x	Clare Briggs	10/9/22 1242	x		

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Landfill Groundwater
Work Order Number: 2212264

December 22, 2022

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 6 sample(s) on 12/13/2022 for the analyses presented in the following report.

Dissolved Metals by EPA Method 200.8
Ion Chromatography by EPA Method 300.0
Total Metals by EPA Method 200.8
Total Alkalinity by SM 2320B
Total Suspended Solids (TSS) by SM 2540D
Volatile Organic Compounds by EPA Method 8260D SIM

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *12/22/2022*

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater
Work Order: 2212264

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2212264-001	BMW-12	12/13/2022 6:20 AM	12/13/2022 1:00 PM
2212264-002	BMW-13	12/13/2022 7:25 AM	12/13/2022 1:00 PM
2212264-003	BMW-14	12/13/2022 8:25 AM	12/13/2022 1:00 PM
2212264-004	BMW-114	12/13/2022 8:25 AM	12/13/2022 1:00 PM
2212264-005	BMW-15	12/13/2022 9:25 AM	12/13/2022 1:00 PM
2212264-006	Trip Blank	11/30/2022 1:30 PM	12/13/2022 1:00 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2212264**
Date: **12/22/2022**

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2212264**
Date Reported: **12/22/2022**

Client: City of Bainbridge Island
Collection Date: 12/13/2022 6:20:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2212264-001
Matrix: Groundwater
Client Sample ID: **BMW-12**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 38867		Analyst: LAC
Vinyl chloride	ND	0.100		µg/L	1	12/16/2022 8:07:53 PM
1,1-Dichloroethene	ND	0.0250		µg/L	1	12/16/2022 8:07:53 PM
Surr: Dibromofluoromethane	101	80 - 120		%Rec	1	12/16/2022 8:07:53 PM
Surr: Toluene-d8	97.0	80 - 120		%Rec	1	12/16/2022 8:07:53 PM
Surr: 1-Bromo-4-fluorobenzene	98.0	80 - 120		%Rec	1	12/16/2022 8:07:53 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 38829		Analyst: AT
Chloride	15.8	2.00	D	mg/L	20	12/13/2022 4:25:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	12/14/2022 6:27:00 PM
Nitrate (as N)	1.79	0.100		mg/L	1	12/14/2022 6:27:00 PM
Sulfate	8.72	0.600		mg/L	1	12/14/2022 6:27:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 38837		Analyst: EH
Calcium	16,000	525		µg/L	1	12/16/2022 10:22:24 AM
Iron	ND	100		µg/L	1	12/15/2022 1:03:31 PM
Magnesium	11,600	100		µg/L	1	12/15/2022 1:03:31 PM
Manganese	ND	1.80		µg/L	1	12/15/2022 1:03:31 PM
Potassium	1,000	200		µg/L	1	12/15/2022 1:03:31 PM
Sodium	6,730	250		µg/L	1	12/15/2022 1:03:31 PM
Total Metals by EPA Method 200.8				Batch ID: 38835		Analyst: EH
Manganese	ND	5.00		µg/L	1	12/16/2022 3:36:59 PM
Total Alkalinity by SM 2320B				Batch ID: R80667		Analyst: SS
Alkalinity, Bicarbonate (As CaCO3)	66.6	2.50		mg/L	1	12/22/2022 10:32:56 AM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	12/22/2022 10:32:56 AM
Alkalinity, Total (As CaCO3)	70.2	2.50		mg/L	1	12/22/2022 10:32:56 AM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R80508		Analyst: AT
Total Suspended Solids	ND	3.00		mg/L	1	12/15/2022 12:26:21 PM

Analytical Report

Work Order: **2212264**
Date Reported: **12/22/2022**

Client: City of Bainbridge Island
Collection Date: 12/13/2022 7:25:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2212264-002
Matrix: Groundwater
Client Sample ID: **BMW-13**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 38867		Analyst: LAC
Vinyl chloride	ND	0.100		µg/L	1	12/16/2022 8:41:22 PM
1,1-Dichloroethene	ND	0.0250		µg/L	1	12/16/2022 8:41:22 PM
Surr: Dibromofluoromethane	110	80 - 120		%Rec	1	12/16/2022 8:41:22 PM
Surr: Toluene-d8	94.9	80 - 120		%Rec	1	12/16/2022 8:41:22 PM
Surr: 1-Bromo-4-fluorobenzene	101	80 - 120		%Rec	1	12/16/2022 8:41:22 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 38829		Analyst: AT
Chloride	9.04	0.500	D	mg/L	5	12/13/2022 4:48:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	12/14/2022 6:51:00 PM
Nitrate (as N)	0.579	0.100		mg/L	1	12/14/2022 6:51:00 PM
Sulfate	29.4	3.00	D	mg/L	5	12/13/2022 4:48:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 38837		Analyst: EH
Calcium	83,900	1,050	D	µg/L	2	12/16/2022 10:23:48 AM
Iron	ND	100		µg/L	1	12/15/2022 1:06:14 PM
Magnesium	71,100	100		µg/L	1	12/15/2022 1:06:14 PM
Manganese	4,820	1.80		µg/L	1	12/15/2022 1:06:14 PM
Potassium	2,200	200		µg/L	1	12/15/2022 1:06:14 PM
Sodium	17,600	250		µg/L	1	12/15/2022 1:06:14 PM
Total Metals by EPA Method 200.8				Batch ID: 38835		Analyst: EH
Manganese	5,160	100	D	µg/L	20	12/19/2022 10:51:29 AM
Total Alkalinity by SM 2320B				Batch ID: R80667		Analyst: SS
Alkalinity, Bicarbonate (As CaCO3)	493	2.50		mg/L	1	12/22/2022 10:32:56 AM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	12/22/2022 10:32:56 AM
Alkalinity, Total (As CaCO3)	525	2.50		mg/L	1	12/22/2022 10:32:56 AM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R80508		Analyst: AT
Total Suspended Solids	6.00	3.00		mg/L	1	12/15/2022 12:26:21 PM

Analytical Report

Work Order: **2212264**
Date Reported: **12/22/2022**

Client: City of Bainbridge Island
Collection Date: 12/13/2022 8:25:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2212264-003
Matrix: Groundwater
Client Sample ID: **BMW-14**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 38867		Analyst: LAC
Vinyl chloride	0.124	0.100		µg/L	1	12/16/2022 9:14:53 PM
1,1-Dichloroethene	ND	0.0250		µg/L	1	12/16/2022 9:14:53 PM
Surr: Dibromofluoromethane	101	80 - 120		%Rec	1	12/16/2022 9:14:53 PM
Surr: Toluene-d8	96.0	80 - 120		%Rec	1	12/16/2022 9:14:53 PM
Surr: 1-Bromo-4-fluorobenzene	96.7	80 - 120		%Rec	1	12/16/2022 9:14:53 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 38829		Analyst: AT
Chloride	7.32	0.500	D	mg/L	5	12/13/2022 5:11:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	12/14/2022 7:14:00 PM
Nitrate (as N)	0.454	0.100		mg/L	1	12/14/2022 7:14:00 PM
Sulfate	19.8	3.00	D	mg/L	5	12/13/2022 5:11:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 38837		Analyst: EH
Calcium	51,700	1,050	DE	µg/L	2	12/16/2022 10:26:37 AM
Iron	ND	100		µg/L	1	12/15/2022 1:11:41 PM
Magnesium	46,100	100		µg/L	1	12/15/2022 1:11:41 PM
Manganese	63.5	1.80		µg/L	1	12/15/2022 1:11:41 PM
Potassium	2,340	200		µg/L	1	12/15/2022 1:11:41 PM
Sodium	22,200	250		µg/L	1	12/15/2022 1:11:41 PM
Total Metals by EPA Method 200.8				Batch ID: 38835		Analyst: EH
Manganese	66.7	5.00		µg/L	1	12/16/2022 3:42:25 PM
Total Alkalinity by SM 2320B				Batch ID: R80667		Analyst: SS
Alkalinity, Bicarbonate (As CaCO3)	261	2.50		mg/L	1	12/22/2022 10:32:56 AM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	12/22/2022 10:32:56 AM
Alkalinity, Total (As CaCO3)	332	2.50		mg/L	1	12/22/2022 10:32:56 AM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R80508		Analyst: AT
Total Suspended Solids	ND	3.00		mg/L	1	12/15/2022 12:26:21 PM

Analytical Report

Work Order: **2212264**
Date Reported: **12/22/2022**

Client: City of Bainbridge Island
Collection Date: 12/13/2022 8:25:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2212264-004
Matrix: Groundwater
Client Sample ID: **BMW-114**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 38867		Analyst: LAC
Vinyl chloride	0.126	0.100		µg/L	1	12/16/2022 9:48:22 PM
1,1-Dichloroethene	ND	0.0250		µg/L	1	12/16/2022 9:48:22 PM
Surr: Dibromofluoromethane	100	80 - 120		%Rec	1	12/16/2022 9:48:22 PM
Surr: Toluene-d8	98.0	80 - 120		%Rec	1	12/16/2022 9:48:22 PM
Surr: 1-Bromo-4-fluorobenzene	97.4	80 - 120		%Rec	1	12/16/2022 9:48:22 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 38829		Analyst: AT
Chloride	7.22	0.500	D	mg/L	5	12/13/2022 5:34:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	12/14/2022 7:37:00 PM
Nitrate (as N)	0.448	0.100		mg/L	1	12/14/2022 7:37:00 PM
Sulfate	20.1	3.00	D	mg/L	5	12/13/2022 5:34:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 38837		Analyst: EH
Calcium	50,800	1,050	D	µg/L	2	12/16/2022 10:30:51 AM
Iron	ND	100		µg/L	1	12/15/2022 1:14:24 PM
Magnesium	45,900	100		µg/L	1	12/15/2022 1:14:24 PM
Manganese	60.7	1.80		µg/L	1	12/15/2022 1:14:24 PM
Potassium	2,390	200		µg/L	1	12/15/2022 1:14:24 PM
Sodium	22,300	250		µg/L	1	12/15/2022 1:14:24 PM
Total Metals by EPA Method 200.8				Batch ID: 38835		Analyst: EH
Manganese	61.7	5.00		µg/L	1	12/16/2022 3:45:09 PM
Total Alkalinity by SM 2320B				Batch ID: R80667		Analyst: SS
Alkalinity, Bicarbonate (As CaCO3)	525	2.50		mg/L	1	12/22/2022 10:32:56 AM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	12/22/2022 10:32:56 AM
Alkalinity, Total (As CaCO3)	601	2.50		mg/L	1	12/22/2022 10:32:56 AM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R80508		Analyst: AT
Total Suspended Solids	ND	3.00		mg/L	1	12/15/2022 12:26:21 PM

Analytical Report

Work Order: **2212264**
Date Reported: **12/22/2022**

Client: City of Bainbridge Island
Collection Date: 12/13/2022 9:25:00 AM
Project: Vincent Landfill Groundwater
Lab ID: 2212264-005
Matrix: Groundwater
Client Sample ID: **BMW-15**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260D SIM				Batch ID: 38867		Analyst: LAC
Vinyl chloride	ND	0.100		µg/L	1	12/16/2022 10:21:52 PM
1,1-Dichloroethene	ND	0.0250		µg/L	1	12/16/2022 10:21:52 PM
Surr: Dibromofluoromethane	99.8	80 - 120		%Rec	1	12/16/2022 10:21:52 PM
Surr: Toluene-d8	97.4	80 - 120		%Rec	1	12/16/2022 10:21:52 PM
Surr: 1-Bromo-4-fluorobenzene	97.2	80 - 120		%Rec	1	12/16/2022 10:21:52 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 38829		Analyst: AT
Chloride	24.0	2.00	D	mg/L	20	12/13/2022 5:58:00 PM
Nitrite (as N)	ND	2.00	D	mg/L	20	12/13/2022 5:58:00 PM
Nitrate (as N)	2.60	2.00	D	mg/L	20	12/13/2022 5:58:00 PM
Sulfate	38.4	12.0	D	mg/L	20	12/13/2022 5:58:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 38837		Analyst: EH
Calcium	50,800	1,050	D	µg/L	2	12/16/2022 10:32:15 AM
Iron	ND	100		µg/L	1	12/15/2022 1:17:07 PM
Magnesium	38,100	100		µg/L	1	12/15/2022 1:17:07 PM
Manganese	ND	1.80		µg/L	1	12/15/2022 1:17:07 PM
Potassium	2,100	200		µg/L	1	12/15/2022 1:17:07 PM
Sodium	27,800	250		µg/L	1	12/15/2022 1:17:07 PM
Total Metals by EPA Method 200.8				Batch ID: 38835		Analyst: EH
Manganese	ND	5.00		µg/L	1	12/16/2022 3:47:52 PM
Total Alkalinity by SM 2320B				Batch ID: R80667		Analyst: SS
Alkalinity, Bicarbonate (As CaCO3)	218	2.50		mg/L	1	12/22/2022 10:32:56 AM
Alkalinity, Carbonate (As CaCO3)	ND	2.50		mg/L	1	12/22/2022 10:32:56 AM
Alkalinity, Total (As CaCO3)	269	2.50		mg/L	1	12/22/2022 10:32:56 AM
Total Suspended Solids (TSS) by SM 2540D				Batch ID: R80508		Analyst: AT
Total Suspended Solids	ND	3.00		mg/L	1	12/15/2022 12:26:21 PM

Work Order: 2212264
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: **MB-R80667**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **12/22/2022**		RunNo: **80667**		
Client ID: **MBLKW**	Batch ID: **R80667**					Analysis Date: **12/22/2022**		SeqNo: **1668479**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-R80667**	SampType: **LCS**			Units: **mg/L**		Prep Date: **12/22/2022**		RunNo: **80667**		
Client ID: **LCSW**	Batch ID: **R80667**					Analysis Date: **12/22/2022**		SeqNo: **1668480**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	99.9	2.50	100.0	0	99.9	81.3	118				

Sample ID: **2212264-001DDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/22/2022**		RunNo: **80667**		
Client ID: **BMW-12**	Batch ID: **R80667**					Analysis Date: **12/22/2022**		SeqNo: **1668593**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	70.8	2.50						70.23	0.883	20	

Work Order: 2212264
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **MB-38829**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **12/13/2022**	RunNo: **80514**
Client ID: **MBLKW**	Batch ID: **38829**		Analysis Date: **12/13/2022**	SeqNo: **1664741**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.120									
Nitrite (as N)	ND	0.120									
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.600									

Sample ID: **LCS-38829**	SampType: **LCS**	Units: **mg/L**	Prep Date: **12/13/2022**	RunNo: **80514**
Client ID: **LCSW**	Batch ID: **38829**		Analysis Date: **12/13/2022**	SeqNo: **1664742**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.754	0.120	0.7500	0	101	90	110				
Nitrite (as N)	0.746	0.120	0.7500	0	99.5	90	110				
Nitrate (as N)	0.710	0.100	0.7500	0	94.7	90	110				
Sulfate	3.72	0.600	3.750	0	99.1	90	110				

Sample ID: **2212264-005DDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **12/13/2022**	RunNo: **80514**
Client ID: **BMW-15**	Batch ID: **38829**		Analysis Date: **12/13/2022**	SeqNo: **1664752**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	23.1	2.40						23.96	3.48	20	D
Nitrite (as N)	ND	2.40						0		20	D
Nitrate (as N)	2.50	2.00						2.600	3.92	20	D
Sulfate	37.7	12.0						38.40	1.89	20	D

Sample ID: **2212264-005DMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **12/13/2022**	RunNo: **80514**
Client ID: **BMW-15**	Batch ID: **38829**		Analysis Date: **12/13/2022**	SeqNo: **1664753**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	38.0	2.40	15.00	23.96	93.5	80	120				D
Nitrite (as N)	14.4	2.40	15.00	0	96.3	80	120				D
Nitrate (as N)	17.1	2.00	15.00	2.600	96.4	80	120				D

Work Order: 2212264
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **2212264-005DMS** SampType: **MS** Units: **mg/L** Prep Date: **12/13/2022** RunNo: **80514**
Client ID: **BMW-15** Batch ID: **38829** Analysis Date: **12/13/2022** SeqNo: **1664753**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	110	12.0	75.00	38.40	94.8	80	120				D

Sample ID: **2212264-005DMSD** SampType: **MSD** Units: **mg/L** Prep Date: **12/13/2022** RunNo: **80514**
Client ID: **BMW-15** Batch ID: **38829** Analysis Date: **12/13/2022** SeqNo: **1664754**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	38.2	2.40	15.00	23.96	94.7	80	120	37.98	0.473	20	D
Nitrite (as N)	14.7	2.40	15.00	0	98.0	80	120	14.44	1.78	20	D
Nitrate (as N)	17.3	2.00	15.00	2.600	98.0	80	120	17.06	1.40	20	D
Sulfate	111	12.0	75.00	38.40	96.5	80	120	109.5	1.13	20	D

Work Order: 2212264
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Suspended Solids (TSS) by SM 2540D

Sample ID: **MB-R80508**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **12/15/2022**		RunNo: **80508**		
Client ID: **MBLKW**	Batch ID: **R80508**					Analysis Date: **12/15/2022**		SeqNo: **1664476**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Suspended Solids	ND	3.00									

Sample ID: **LCS-R80508**	SampType: **LCS**			Units: **mg/L**		Prep Date: **12/15/2022**		RunNo: **80508**		
Client ID: **LCSW**	Batch ID: **R80508**					Analysis Date: **12/15/2022**		SeqNo: **1664477**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Suspended Solids	272	3.00	300.0	0	90.7	65	135				

Sample ID: **2212264-005DDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/15/2022**		RunNo: **80508**		
Client ID: **BMW-15**	Batch ID: **R80508**					Analysis Date: **12/15/2022**		SeqNo: **1664483**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Suspended Solids	ND	3.00						0		30	

Work Order: 2212264
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-38836FB** SampType: **MBLK** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **MBLKW** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664577**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	ND	100									
Magnesium	ND	100									
Manganese	ND	1.80									
Potassium	ND	200									
Sodium	ND	250									

Sample ID: **MB-38837** SampType: **MBLK** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **MBLKW** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664578**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	ND	100									
Magnesium	ND	100									
Manganese	ND	1.80									
Potassium	ND	200									
Sodium	ND	250									

Sample ID: **LCS-38837** SampType: **LCS** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **LCSW** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664579**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	4,810	100	5,000	0	96.2	85	115				
Magnesium	4,740	100	5,000	0	94.7	85	115				
Manganese	478	1.80	500.0	0	95.7	85	115				
Potassium	4,670	200	5,000	0	93.5	85	115				
Sodium	4,630	250	5,000	0	92.6	85	115				

Work Order: 2212264
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **2212247-002BDUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **BATCH** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664581**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	ND	100						0		30	
Magnesium	124	100						129.9	4.39	30	
Manganese	6.57	1.80						6.556	0.244	30	
Potassium	252	200						259.0	2.89	30	
Sodium	1,360	250						1,420	4.47	30	

Sample ID: **2212247-002BMS** SampType: **MS** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **BATCH** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664582**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	4,900	100	5,000	0	98.0	50	150				
Magnesium	4,930	100	5,000	129.9	95.9	70	130				
Manganese	491	1.80	500.0	6.556	96.9	70	130				
Potassium	5,050	200	5,000	259.0	95.8	50	150				
Sodium	6,180	250	5,000	1,420	95.1	50	150				

Sample ID: **2212247-002BMSD** SampType: **MSD** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **BATCH** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664583**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	4,850	100	5,000	0	96.9	50	150	4,899	1.08	30	
Magnesium	5,020	100	5,000	129.9	97.8	70	130	4,925	1.88	30	
Manganese	495	1.80	500.0	6.556	97.7	70	130	490.8	0.818	30	
Potassium	5,010	200	5,000	259.0	95.1	50	150	5,051	0.737	30	
Sodium	6,210	250	5,000	1,420	95.8	50	150	6,177	0.519	30	

Work Order: 2212264
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **2212264-002CMS** SampType: **MS** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **BMW-13** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664593**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	4,840	100	5,000	16.71	96.4	50	150				
Magnesium	75,000	100	5,000	71,110	76.9	70	130				
Manganese	5,390	1.80	500.0	4,824	113	70	130				
Potassium	6,980	200	5,000	2,199	95.6	50	150				
Sodium	22,300	250	5,000	17,560	94.4	50	150				

Sample ID: **MB-38837** SampType: **MBLK** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **MBLKW** Batch ID: **38837** Analysis Date: **12/16/2022** SeqNo: **1665416**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	525									

Sample ID: **LCS-38837** SampType: **LCS** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **LCSW** Batch ID: **38837** Analysis Date: **12/16/2022** SeqNo: **1665417**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	4,960	525	5,000	0	99.1	85	115				

Sample ID: **2212247-002BDUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **BATCH** Batch ID: **38837** Analysis Date: **12/16/2022** SeqNo: **1665419**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	1,800	525						1,794	0.374	30	

Sample ID: **2212247-002BMS** SampType: **MS** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **BATCH** Batch ID: **38837** Analysis Date: **12/16/2022** SeqNo: **1665420**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	6,820	525	5,000	1,794	100	50	150				

Work Order: 2212264
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **2212247-002BMSD** SampType: **MSD** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **BATCH** Batch ID: **38837** Analysis Date: **12/16/2022** SeqNo: **1665421**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	6,830	525	5,000	1,794	101	50	150	6,816	0.176	30	

Sample ID: **2212264-002CMS** SampType: **MS** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **BMW-13** Batch ID: **38837** Analysis Date: **12/16/2022** SeqNo: **1665424**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	93,100	1,050	10,000	83,940	91.3	50	150				DE

Work Order: 2212264
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **MB-38835**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/14/2022**		RunNo: **80559**		
Client ID: **MBLKW**	Batch ID: **38835**					Analysis Date: **12/16/2022**		SeqNo: **1665650**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	2.00									

Sample ID: **LCS-38835**	SampType: **LCS**			Units: **µg/L**		Prep Date: **12/14/2022**		RunNo: **80559**		
Client ID: **LCSW**	Batch ID: **38835**					Analysis Date: **12/16/2022**		SeqNo: **1665651**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	99.5	2.00	100.0	0	99.5	85	115				

Sample ID: **2212247-003ADUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **12/14/2022**		RunNo: **80559**		
Client ID: **BATCH**	Batch ID: **38835**					Analysis Date: **12/16/2022**		SeqNo: **1665653**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	7.30	2.00						7.438	1.88	30	

Sample ID: **2212247-003AMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **12/14/2022**		RunNo: **80559**		
Client ID: **BATCH**	Batch ID: **38835**					Analysis Date: **12/16/2022**		SeqNo: **1665654**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	105	2.00	100.0	7.438	97.2	70	130				

Sample ID: **2212250-002BMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **12/14/2022**		RunNo: **80559**		
Client ID: **BATCH**	Batch ID: **38835**					Analysis Date: **12/16/2022**		SeqNo: **1665662**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	103	2.00	100.0	4.907	98.4	70	130				

Work Order: 2212264
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D SIM

Sample ID: **LCS-38867**	SampType: **LCS**			Units: **µg/L**		Prep Date: **12/16/2022**		RunNo: **80648**			
Client ID: **LCSW**	Batch ID: **38867**					Analysis Date: **12/16/2022**		SeqNo: **1667903**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	4.57	0.100	5.000	0	91.5	59.3	126				
1,1-Dichloroethene	4.81	0.0250	5.000	0	96.1	65.1	119				
Surr: Dibromofluoromethane	10.2		10.00		102	80	120				
Surr: Toluene-d8	10.0		10.00		100	80	120				
Surr: 1-Bromo-4-fluorobenzene	10.1		10.00		101	80	120				

Sample ID: **MB-38867**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/16/2022**		RunNo: **80648**			
Client ID: **MBLKW**	Batch ID: **38867**					Analysis Date: **12/16/2022**		SeqNo: **1667902**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.100									
1,1-Dichloroethene	ND	0.0250									
Surr: Dibromofluoromethane	10.1		10.00		101	80	120				
Surr: Toluene-d8	9.91		10.00		99.1	80	120				
Surr: 1-Bromo-4-fluorobenzene	10.1		10.00		101	80	120				

Sample ID: **2212299-001BDUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **12/16/2022**		RunNo: **80648**			
Client ID: **BATCH**	Batch ID: **38867**					Analysis Date: **12/16/2022**		SeqNo: **1667898**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.100						0		30	
1,1-Dichloroethene	ND	0.0250						0		30	
Surr: Dibromofluoromethane	10.0		10.00		100	80	120		0		
Surr: Toluene-d8	9.66		10.00		96.6	80	120		0		
Surr: 1-Bromo-4-fluorobenzene	9.86		10.00		98.6	80	120		0		

Work Order: 2212264
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Groundwater

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D SIM

Sample ID: **2212208-027BMS** SampType: **MS** Units: **µg/L** Prep Date: **12/16/2022** RunNo: **80648**
Client ID: **BATCH** Batch ID: **38867** Analysis Date: **12/17/2022** SeqNo: **1667905**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	5.99	0.100	5.000	0	120	47.4	138				
1,1-Dichloroethene	6.19	0.0250	5.000	0	124	72.1	135				
Surr: Dibromofluoromethane	10.5		10.00		105	80	120				
Surr: Toluene-d8	10.2		10.00		102	80	120				
Surr: 1-Bromo-4-fluorobenzene	10.3		10.00		103	80	120				

Sample ID: **2212208-027BMSD** SampType: **MSD** Units: **µg/L** Prep Date: **12/16/2022** RunNo: **80648**
Client ID: **BATCH** Batch ID: **38867** Analysis Date: **12/17/2022** SeqNo: **1667890**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	6.43	0.100	5.000	0	129	47.4	138	5.993	7.09	30	
1,1-Dichloroethene	5.93	0.0250	5.000	0	119	72.1	135	6.191	4.34	30	
Surr: Dibromofluoromethane	10.1		10.00		101	80	120		0		
Surr: Toluene-d8	10.0		10.00		100	80	120		0		
Surr: 1-Bromo-4-fluorobenzene	10.1		10.00		101	80	120		0		

Sample Log-In Check List

Client Name:	**COBI**	Work Order Number:	**2212264**
Logged by:	**Clare Griggs**	Date Received:	**12/13/2022 1:00:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Client		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Present ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☑	NA ☐
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☑	No ☐	NA ☐

Person Notified:	Ray Navarette	Date:	12/14/2022
By Whom:	Clare Griggs	Via:	☑ eMail ☑ Phone ☐ Fax ☐ In Person
Regarding:	Confirming COC/analysis.		
Client Instructions:	Analyze per Table 1 on file		

19. Additional remarks:

Item Information

Item #	Temp °C
Sample	4.1

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 12-13-2022 | Page: | of:

Laboratory Project No (internal): 2212264

Project Name: Vincent Landfill Groundwater

Special Remarks: VOCS: 1,1 - DCE, VC only.

Project No:

Client: City of Bainbridge Island

Collected by: ~~Ray Navarette~~ ROBERT GOLDEN

Address: 7305 NE Hidden Cove Rd

Location: Vincent Landfill

City, State, Zip: Bainbridge Island, WA 98110

Report To (PM): Aaron Claiborne

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Telephone: 206-780-3585

PM Email: Aclaiborne@bainbridgewa.gov

Fax: 206-780-5104

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	# of Cont.	VOCs (EPA 8260 / 624)	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8) Total (T) | Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1	BMW-12	12-13-22	6:20	GW	6	X							X	X			
2	BMW-13	12-13-22	7:25	GW	6	X							X	X			
3	BMW-14	12-13-22	8:25	GW	6	X							X	X			
4	BMW-114	12-13-22	8:25	GW	6	X							X	X			
5	BMW-15	12-13-22	9:25	GW	8	X							X	X			
6	BOW-37			GW	6	X							X	X			Collect 2 additional VOAs
7																	SITE UNDER CONSTRUCTION / NO SAMPLES
8																	
9																	
10																	

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be (Ca) Cd Co Cr Cu (Fe) Hg (K) (Mg) (Mn) Mo (Na) Ni Pb Sb Se Sr Sn Ti Tl V Zn

***Anions (Circle): (Nitrate) (Nitrite) (Chloride) (Sulfate) Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:
☒ Standard ☐ Next Day
☐ 3 Day ☐ Same Day
☐ 2 Day (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

	Relinquished (Signature)	Print Name	Date/Time	Received (Signature)	Print Name	Date/Time
x	Robert Golden	~~Ray Navarette~~ ROBERT GOLDEN	12-13-2022 1:00	x Glenn Kelly	Elisabeth Savard	12/13/22 1:00
x	Relinquished (Signature)	Print Name	Date/Time	Received (Signature)	Print Name	Date/Time
			12-13-2022 1:00	x		

COC 1.3 - 11.06.20

www.fremontanalytical.com

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 12-13-2022 | Page: | of:

Laboratory Project No (internal): 2212264

Project Name: Vincent Landfill Groundwater

Special Remarks:
VOCS: 1,1 - DCE, VC only.
* VOCs by 8260 SIM
edits per Table 1 12/13/22 -cg

Project No:

Client: City of Bainbridge Island

Collected by: ~~Ray Navarette~~ ROBERT GOLDEN

Address: 7305 NE Hidden Cove Rd

Location: Vincent Landfill

City, State, Zip: Bainbridge Island, WA 98110

Report To (PM): Aaron Claiborne

Telephone: 206-780-3585

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Fax: 206-780-5104

PM Email: Aclaiborne@bainbridgewa.gov

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	# of Cont.	VOCs (EPA 8260 / 624) *	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T) / Dissolved (D)	Anions (IC)***	EDB (8011)	TSS, Alkalinity	Comments
1 BMW-12	12-13-22	6:20	GW	6	X							X	T/D	X			X	Total = Mn
2 BMW-13	12-13-22	7:25	GW	6	X							X	T/D	X			X	Diss = Ca, Fe, Mg, Mg, K,. Na
3 BMW-14	12-13-22	8:25	GW	6	X							X	T/D	X			X	Alk w/ card/bicarb
4 BMW-114	12-13-22	8:25	GW	6	X							X	T/D	X			X	
5 BMW-15	12-13-22	9:25	GW	8	X							X	T/D	X			X	
6 ~~BOW-37~~			GW	6	X							X	T/D	X			X	Collect 2 additional VOAs
7																		SITE UNDER CONSTRUCTION / NO SAMPLES
8																		
9																		
10																		

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be (Ca) Cd Co Cr Cu (Fe) Hg (K) (Mg) (Mn) Mo (Na) Ni Pb Sb Se Sr Sn Ti Tl V Zn

***Anions (Circle): (Nitrate) (Nitrite) (Chloride) (Sulfate) Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:
☒ Standard ☐ Next Day
☐ 3 Day ☐ Same Day
☐ 2 Day (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

	Print Name	Date/Time		Print Name	Date/Time
Relinquished (Signature) x	~~Ray Navarette~~ ROBERT GOLDEN	12-13-2022 1:00	Received (Signature) x	Elisabeth Savard	12/13/22 1:00
Relinquished (Signature) x		12-13-2022 1:00	Received (Signature) x		

COC 1.3 - 11.06.20

www.fremontanalytical.com

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
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City of Bainbridge Island
Aaron Claiborne
280 Madison Ave N
Bainbridge Island, WA 98110

RE: Vincent Landfill Surfacewater
Work Order Number: 2212265

December 20, 2022

Attention Aaron Claiborne:

Fremont Analytical, Inc. received 3 sample(s) on 12/13/2022 for the analyses presented in the following report.

Dissolved Metals by EPA Method 200.8
Fecal Coliform by Colilert 18
Total Metals by EPA Method 200.8
Total Alkalinity by SM 2320B
Total Coliform & E.coli by SM 9223B (IDEXX)

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *12/20/2022*

CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater
Work Order: 2212265

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2212265-001	SWU-1	12/13/2022 10:05 AM	12/13/2022 1:00 PM
2212265-002	SWD-1	12/13/2022 10:40 AM	12/13/2022 1:00 PM
2212265-003	SWD-11 (Dup)	12/13/2022 10:40 AM	12/13/2022 1:00 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2212265**

Date: **12/20/2022**

CLIENT: City of Bainbridge Island

Project: Vincent Landfill Surfacewater

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry"). Bacteria results are reported in Most Probable Number (MPN) per 100mL.

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2212265**
Date Reported: **12/20/2022**

Client: City of Bainbridge Island
Collection Date: 12/13/2022 10:05:00 AM
Project: Vincent Landfill Surfacewater
Lab ID: 2212265-001
Matrix: Surface Water
Client Sample ID: **SWU-1**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Fecal Coliform by Colilert 18				Batch ID: R80569		Analyst: LB
Coliform, Fecal	18.5	1.00		MPN/100mL	1	12/13/2022 4:26:00 PM
Total Coliform & E.coli by SM 9223B (IDEXX)				Batch ID: R80571		Analyst: LB
Coliform, Total	1,990	1.00		MPN/100mL	1	12/13/2022 3:57:00 PM
E. coli	12.0	1.00		MPN/100mL	1	12/13/2022 3:57:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 38837		Analyst: EH
Copper	ND	2.00		µg/L	1	12/15/2022 1:19:51 PM
Iron	458	100		µg/L	1	12/15/2022 1:19:51 PM
Lead	ND	0.500		µg/L	1	12/15/2022 1:19:51 PM
Zinc	3.96	3.80		µg/L	1	12/15/2022 1:19:51 PM
Total Metals by EPA Method 200.8				Batch ID: 38835		Analyst: EH
Iron	488	100		µg/L	1	12/16/2022 3:50:35 PM
Lead	0.795	0.500		µg/L	1	12/16/2022 3:50:35 PM
Total Alkalinity by SM 2320B				Batch ID: R80564		Analyst: SS
Alkalinity, Total (As CaCO3)	14.0	2.50		mg/L	1	12/19/2022 9:26:58 AM

Analytical Report

Work Order: **2212265**
Date Reported: **12/20/2022**

Client: City of Bainbridge Island
Collection Date: 12/13/2022 10:40:00 AM
Project: Vincent Landfill Surfacewater
Lab ID: 2212265-002
Matrix: Surface Water
Client Sample ID: **SWD-1**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Fecal Coliform by Colilert 18				Batch ID: R80569		Analyst: LB
Coliform, Fecal	36.4	1.00		MPN/100mL	1	12/13/2022 4:26:00 PM
Total Coliform & E.coli by SM 9223B (IDEXX)				Batch ID: R80571		Analyst: LB
Coliform, Total	>2419.6	1.00		MPN/100mL	1	12/13/2022 3:57:00 PM
E. coli	33.6	1.00		MPN/100mL	1	12/13/2022 3:57:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 38837		Analyst: EH
Copper	5.04	2.00		µg/L	1	12/15/2022 1:22:34 PM
Iron	336	100		µg/L	1	12/15/2022 1:22:34 PM
Lead	ND	0.500		µg/L	1	12/15/2022 1:22:34 PM
Zinc	4.99	3.80		µg/L	1	12/15/2022 1:22:34 PM
Total Metals by EPA Method 200.8				Batch ID: 38835		Analyst: EH
Iron	427	100		µg/L	1	12/16/2022 3:53:19 PM
Lead	0.920	0.500		µg/L	1	12/16/2022 3:53:19 PM
Total Alkalinity by SM 2320B				Batch ID: R80564		Analyst: SS
Alkalinity, Total (As CaCO3)	14.1	2.50		mg/L	1	12/19/2022 9:26:58 AM

Analytical Report

Work Order: **2212265**
Date Reported: **12/20/2022**

Client: City of Bainbridge Island
Collection Date: 12/13/2022 10:40:00 AM
Project: Vincent Landfill Surfacewater
Lab ID: 2212265-003
Matrix: Surface Water
Client Sample ID: **SWD-11 (Dup)**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Fecal Coliform by Colilert 18				Batch ID: R80569		Analyst: LB
Coliform, Fecal	38.4	1.00		MPN/100mL	1	12/13/2022 4:26:00 PM
Total Coliform & E.coli by SM 9223B (IDEXX)				Batch ID: R80571		Analyst: LB
Coliform, Total	>2419.6	1.00		MPN/100mL	1	12/13/2022 3:57:00 PM
E. coli	24.6	1.00		MPN/100mL	1	12/13/2022 3:57:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 38837		Analyst: EH
Copper	3.15	2.00		µg/L	1	12/15/2022 2:22:15 PM
Iron	356	100		µg/L	1	12/15/2022 2:22:15 PM
Lead	ND	0.500		µg/L	1	12/15/2022 2:22:15 PM
Zinc	5.96	3.80		µg/L	1	12/15/2022 2:22:15 PM
Total Metals by EPA Method 200.8				Batch ID: 38835		Analyst: EH
Iron	435	100		µg/L	1	12/16/2022 3:56:02 PM
Lead	0.919	0.500		µg/L	1	12/16/2022 3:56:02 PM
Total Alkalinity by SM 2320B				Batch ID: R80564		Analyst: SS
Alkalinity, Total (As CaCO3)	13.9	2.50		mg/L	1	12/19/2022 9:26:58 AM

Work Order: 2212265
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: **MB-R80564**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **12/19/2022**		RunNo: **80564**		
Client ID: **MBLKW**	Batch ID: **R80564**					Analysis Date: **12/19/2022**		SeqNo: **1665838**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-R80564**	SampType: **LCS**			Units: **mg/L**		Prep Date: **12/19/2022**		RunNo: **80564**		
Client ID: **LCSW**	Batch ID: **R80564**					Analysis Date: **12/19/2022**		SeqNo: **1665839**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	99.9	2.50	100.0	0	99.9	81.3	118				

Sample ID: **2212131-001EDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/19/2022**		RunNo: **80564**		
Client ID: **BATCH**	Batch ID: **R80564**					Analysis Date: **12/19/2022**		SeqNo: **1665841**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	210	2.50						214.1	2.13	20	

Work Order: 2212265
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-38836FB** SampType: **MBLK** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **MBLKW** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664577**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	2.00									
Iron	ND	100									
Lead	ND	0.500									
Zinc	ND	3.80									

Sample ID: **MB-38837** SampType: **MBLK** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **MBLKW** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664578**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	2.00									
Iron	ND	100									
Lead	ND	0.500									
Zinc	ND	3.80									

Sample ID: **LCS-38837** SampType: **LCS** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **LCSW** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664579**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	493	2.00	500.0	0	98.6	85	115				
Iron	4,810	100	5,000	0	96.2	85	115				
Lead	266	0.500	250.0	0	106	85	115				
Zinc	486	3.80	500.0	0	97.1	85	115				

Sample ID: **2212247-002BDUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **BATCH** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664581**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	13.2	2.00						13.60	2.82	30	
Iron	ND	100						0		30	
Lead	ND	0.500						0		30	

Work Order: 2212265
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **2212247-002BDUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **BATCH** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664581**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zinc	82.8	3.80						84.52	2.10	30	

Sample ID: **2212247-002BMS** SampType: **MS** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **BATCH** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664582**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	509	2.00	500.0	13.60	99.0	70	130				
Iron	4,900	100	5,000	0	98.0	50	150				
Lead	263	0.500	250.0	0.2105	105	70	130				
Zinc	584	3.80	500.0	84.52	99.8	70	130				

Sample ID: **2212247-002BMSD** SampType: **MSD** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **BATCH** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664583**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	505	2.00	500.0	13.60	98.2	70	130	508.6	0.803	30	
Iron	4,850	100	5,000	0	96.9	50	150	4,899	1.08	30	
Lead	264	0.500	250.0	0.2105	106	70	130	263.3	0.300	30	
Zinc	592	3.80	500.0	84.52	102	70	130	583.6	1.47	30	

Sample ID: **2212264-002CMS** SampType: **MS** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80511**
Client ID: **BATCH** Batch ID: **38837** Analysis Date: **12/15/2022** SeqNo: **1664593**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	486	2.00	500.0	1.514	96.8	70	130				
Iron	4,840	100	5,000	16.71	96.4	50	150				
Lead	256	0.500	250.0	0	103	70	130				
Zinc	503	3.80	500.0	0	101	70	130				

Work Order: 2212265
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **MB-38835** SampType: **MBLK** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80559**
Client ID: **MBLKW** Batch ID: **38835** Analysis Date: **12/16/2022** SeqNo: **1665650**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	ND	100									
Lead	ND	0.500									

Sample ID: **LCS-38835** SampType: **LCS** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80559**
Client ID: **LCSW** Batch ID: **38835** Analysis Date: **12/16/2022** SeqNo: **1665651**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	1,000	100	1,000	0	100	85	115				
Lead	52.0	0.500	50.00	0	104	85	115				

Sample ID: **2212247-003ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80559**
Client ID: **BATCH** Batch ID: **38835** Analysis Date: **12/16/2022** SeqNo: **1665653**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	ND	100						0		30	
Lead	ND	0.500						0		30	

Sample ID: **2212247-003AMS** SampType: **MS** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80559**
Client ID: **BATCH** Batch ID: **38835** Analysis Date: **12/16/2022** SeqNo: **1665654**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	1,040	100	1,000	70.38	97.0	50	150				
Lead	51.5	0.500	50.00	0.4515	102	70	130				

Sample ID: **2212250-002BMS** SampType: **MS** Units: **µg/L** Prep Date: **12/14/2022** RunNo: **80559**
Client ID: **BATCH** Batch ID: **38835** Analysis Date: **12/16/2022** SeqNo: **1665662**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	1,130	100	1,000	116.8	101	50	150				
Lead	52.8	0.500	50.00	0.4239	105	70	130				

Work Order: 2212265
CLIENT: City of Bainbridge Island
Project: Vincent Landfill Surfacewater

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **2212250-002BMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **12/14/2022**			RunNo: **80559**		
Client ID: **BATCH**	Batch ID: **38835**					Analysis Date: **12/16/2022**			SeqNo: **1665662**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample Log-In Check List

Client Name:	**COBI**	Work Order Number:	**2212265**
Logged by:	**Clare Griggs**	Date Received:	**12/13/2022 1:00:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Client		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Present ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes ☑ No ☐ NA ☐

Person Notified:	Ray Navarette	Date:	12/14/2022
By Whom:	Clare Griggs	Via:	☑ eMail ☑ Phone ☐ Fax ☐ In Person
Regarding:	Confirming COC/analysis.		
Client Instructions:	Analyze per Table 1 on file		

19. Additional remarks:

Item Information

Item #	Temp °C
Sample	4.1

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 12-13-2022 | Page: 1 of: 1 | Laboratory Project No (internal): 2212265

Client: City of Bainbridge Island
Address: 7305 NE Hidden Cove Rd
City, State, Zip: Bainbridge Island, WA 98110
Telephone: 206-780-3585
Fax: 206-780-5104

Project Name: Vincent Landfill Surfacewater
Project No:
Collected by: ~~Ray Navarette~~ ROBERT GOLDEN
Location: Vincent Landfill
Report To (PM): Aaron Claiborne
PM Email: Aclaiborne@bainbridgewa.gov

Special Remarks:

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	# of Cont.	VOCs (EPA 8260 / 624)	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8) Total (T) / Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1	SWU-1	12-13-22	10:05	SW									X		X	X	UNFILTERED GRAB SAMPLE
2	SWD-1	12-13-22	10:40	SW									X		X	X	" " "
3	SWD-11 (Dup)	12-13-22	10:40	SW									X		X	X	" " "
4																	
5																	
6																	
7																	
8																	
9																	
10																	

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr (Cu) (Fe) Hg K Mg Mn Mo Na Ni (Pb) Sb Se Sr Sn Ti Tl V (Zn)

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Turn-around Time: ☒ Standard ☐ Next Day ☐ 3 Day ☐ Same Day ☐ 2 Day ____ (specify)

	Relinquished (Signature)	Print Name	Date/Time	Received (Signature)	Print Name	Date/Time
x	[signature]	~~Ray Navarette~~ ROBERTA GOLDEN	12-13-22 1:00	x [signature]	Elisabeth Sanderson	12/13/22 1:00
x	Relinquished (Signature)	Print Name	Date/Time	Received (Signature) x	Print Name	Date/Time
			12-13-22 1:00			

Fremont Analytical

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 12-13-2022 | Page: 1 of: 1 | Laboratory Project No (internal): 2212265

Client: City of Bainbridge Island
Address: 7305 NE Hidden Cove Rd
City, State, Zip: Bainbridge Island, WA 98110
Telephone: 206-780-3585
Fax: 206-780-5104

Project Name: Vincent Landfill Surfacewater
Project No:
Collected by: ~~Ray Navarette~~ ROBERT GOLDEN
Location: Vincent Landfill
Report To (PM): Aaron Claiborne
PM Email: Aclaiborne@bainbridgewa.gov

Special Remarks: edits per Table 1 12/13/22 -cg

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	# of Cont.	VOCs (EPA 8260 / 624)	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200	Total (T) / Dissolv	Anions (I	E coli & Fecal	Alkalinity	Comments
1	SWU-1	12-13-22	10:05	SW										X	T/D		X	X	UNFILTERED GRAB SAMPLE
2	SWD-1	12-13-22	10:40	SW										X	T/D		X	X	" " "
3	SWD-11 (Dup)	12-13-22	10:40	SW										X	T/D		X	X	" " "
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Total = Fe, Pb
Diss = Cu, Fe, Pb, Zn

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr (Cu) (Fe) Hg K Mg Mn Mo Na Ni (Pb) Sb Se Sr Sn Ti Tl V (Zn)

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:
☒ Standard ☐ Next Day
☐ 3 Day ☐ Same Day
☐ 2 Day (specify)

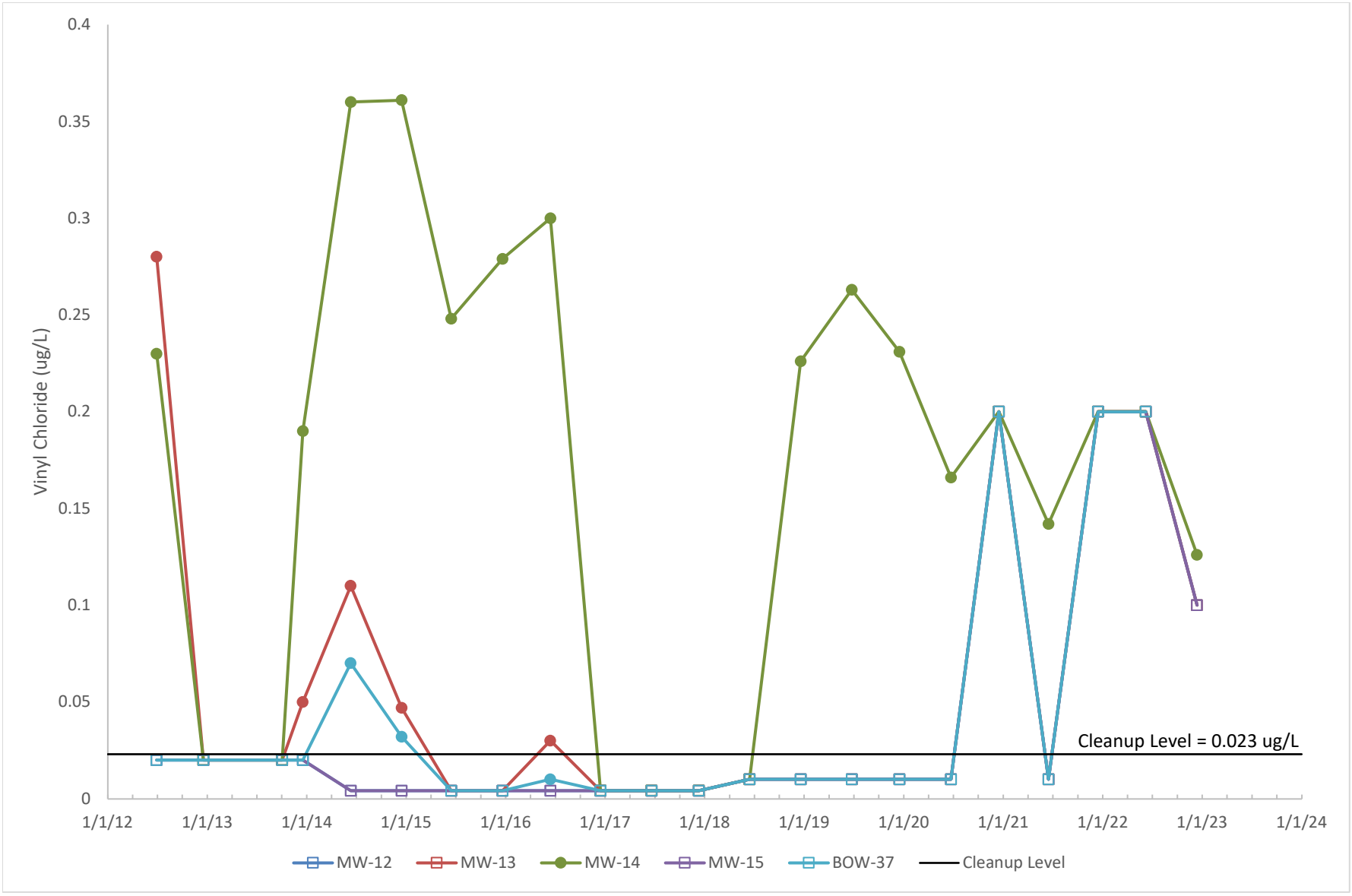
I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

	Print Name	Date/Time
Relinquished (Signature) x [signature]	ROBERTA GOLDEN ~~Ray Navarette~~	12-13-22 1:00
Relinquished (Signature) x		12-13-22 1:00
Received (Signature) x [signature]	Elisabeth Sanderay	12/13/22 1:[illegible]
Received (Signature) x		

COC 1.3 - 11.06.20

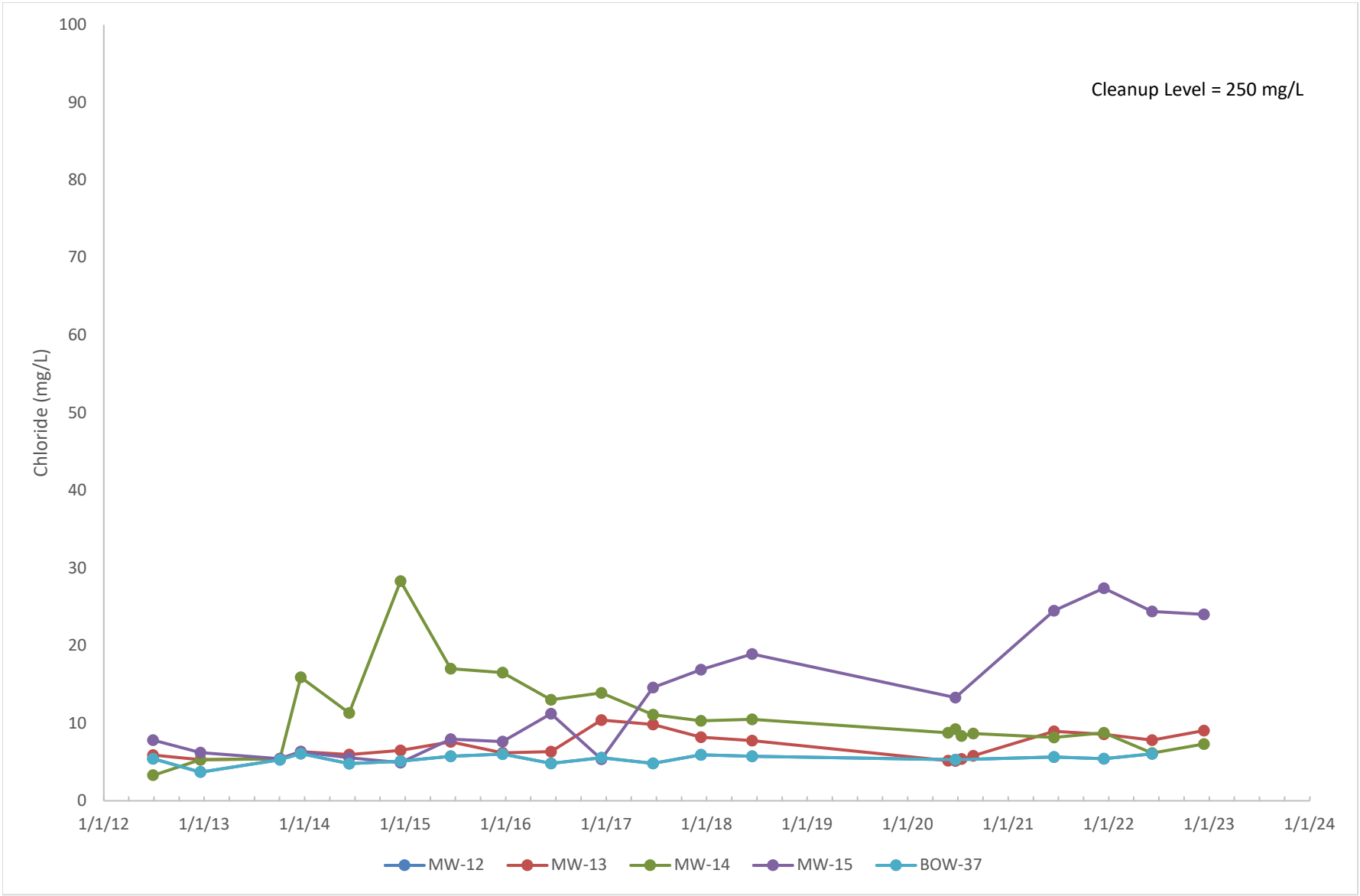
APPENDIX E

Graphical Presentation of Compliance Monitoring Data



Aspect Consulting
9/27/2023
V:\120097 COBI - Vincent Road Landfill\Deliverables\Fourth 5 Year Review Report\CLIENT DRAFT\Appendices\Appendices\App E\App E - Time Series_Flat Water Data as of 20230606_6.9.2023

Figure E-1
Vinyl Chloride Concentrations in Groundwater
Fourth Five-Year Review Report
Bainbridge Island, WA



Note: Filled symbol indicates detected concentration. Open symbol indicates not detected at reporting limit.

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9/27/2023
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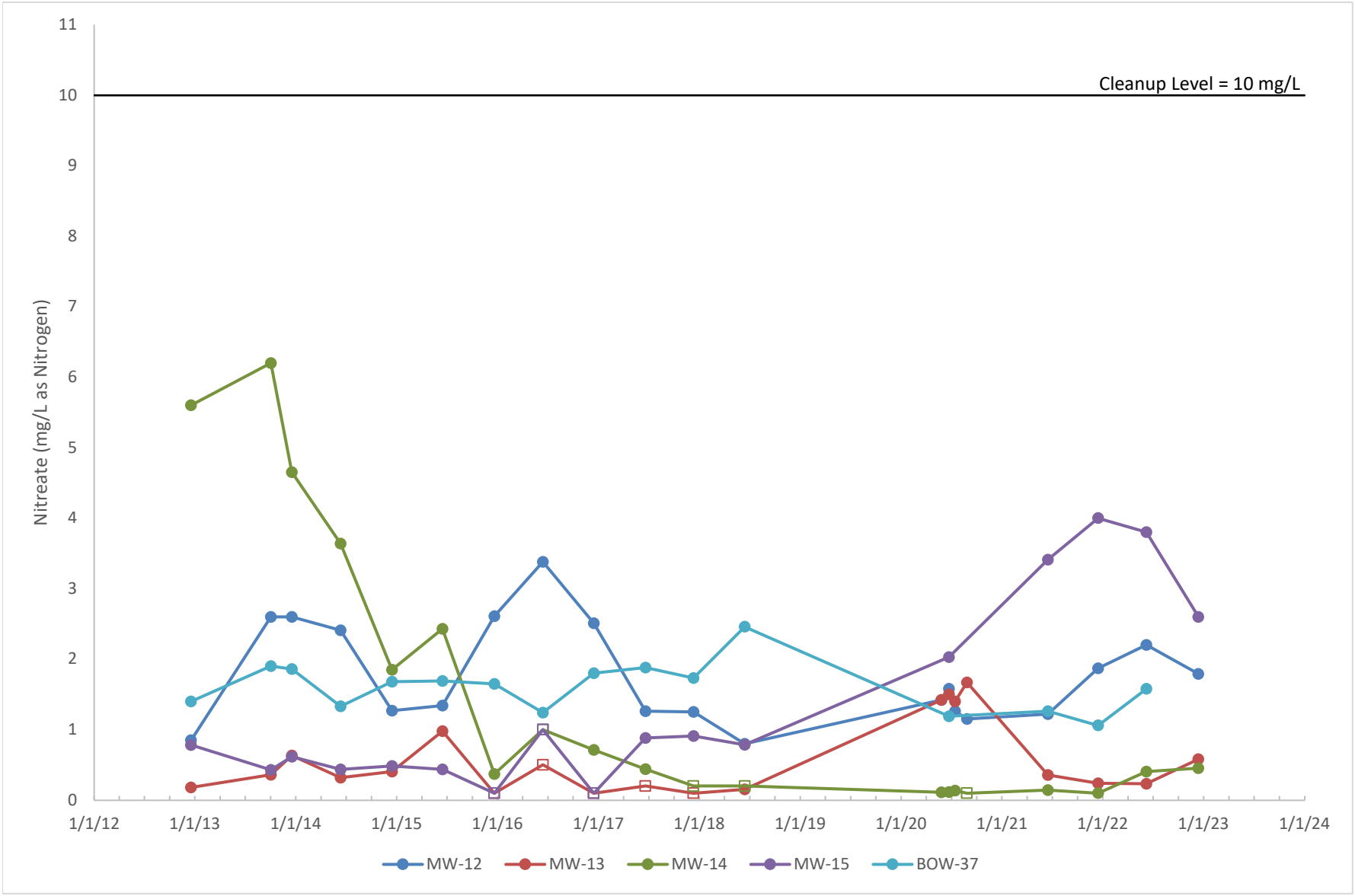
Figure E-2
Chloride Concentrations in Groundwater
Fourth Five-Year Review Report
Bainbridge Island, WA



Note: Filled symbol indicates detected concentration. Open symbol indicates not detected at reporting limit.

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App E - Time Series_Flat Water Data as of 20230606_6.9.2023

Figure E-3
Nitrate Concentrations in Groundwater
Fourth Five-Year Review Report
Bainbridge Island, WA

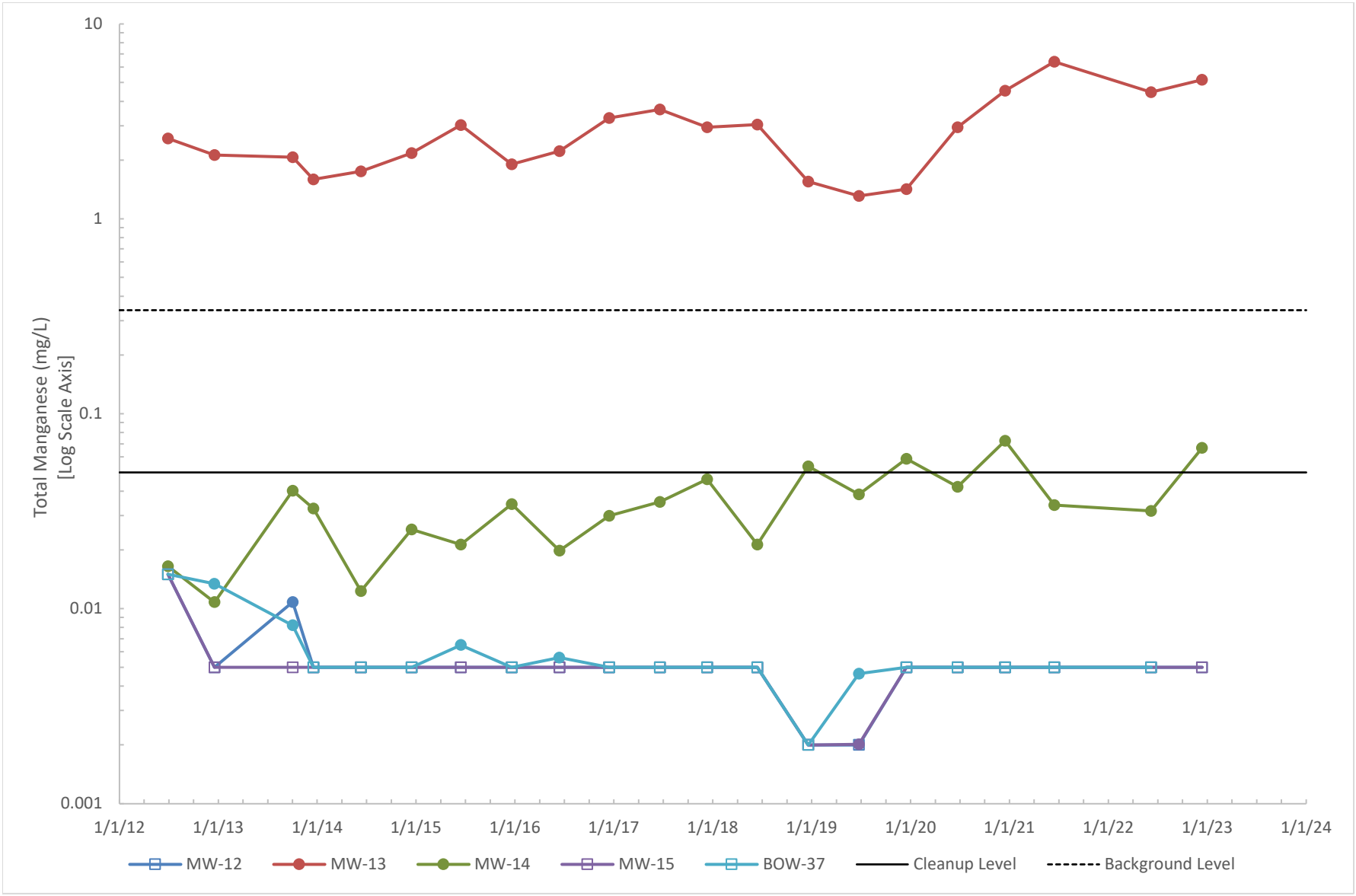

Figure E-4

Total Manganese Concentrations in Groundwater

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Fourth Five-Year Review Report
Bainbridge Island, WA

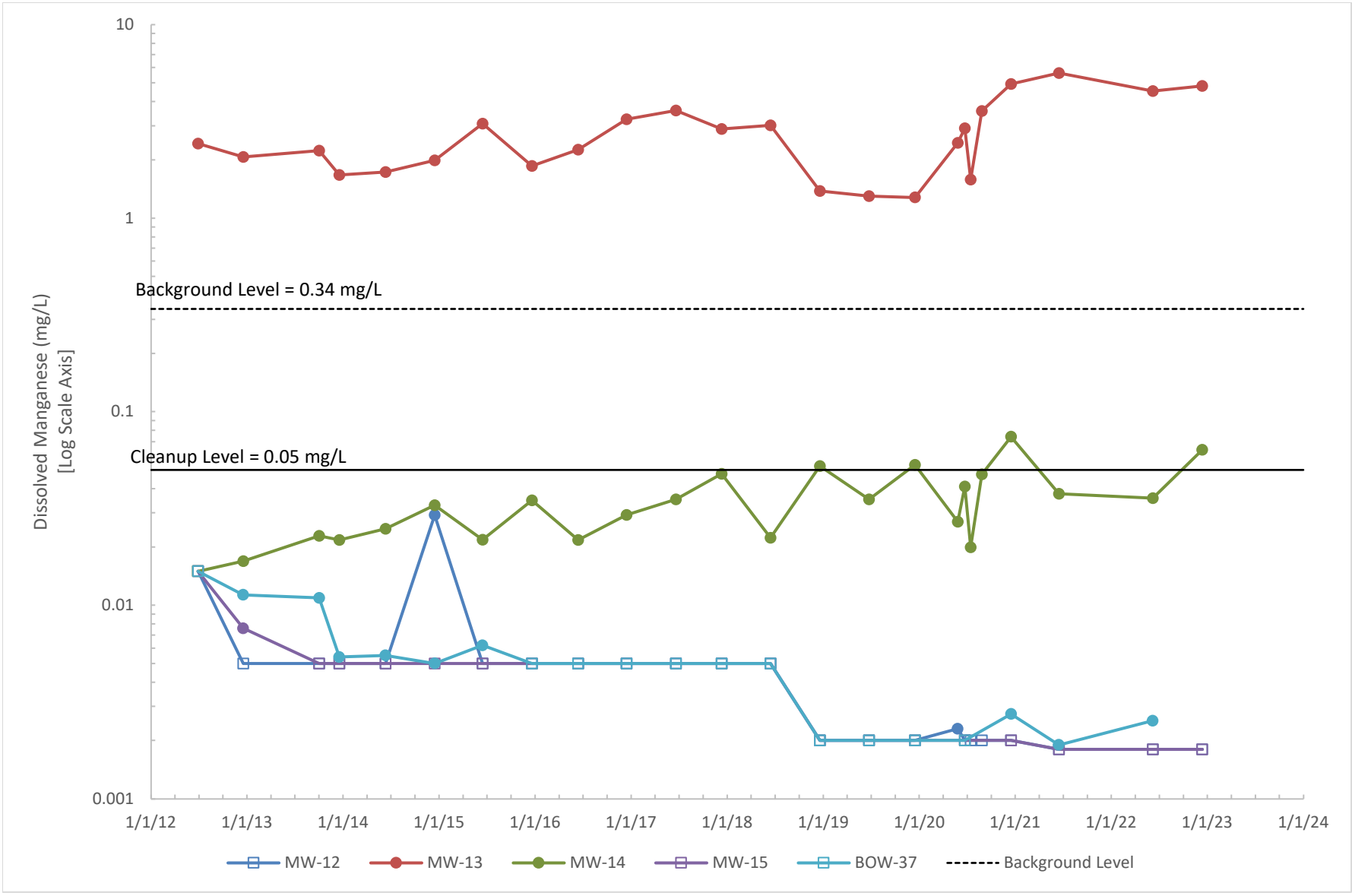

Figure E-5

Dissolved Manganese Concentrations in Groundwater

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Fourth Five-Year Review Report
Bainbridge Island, WA

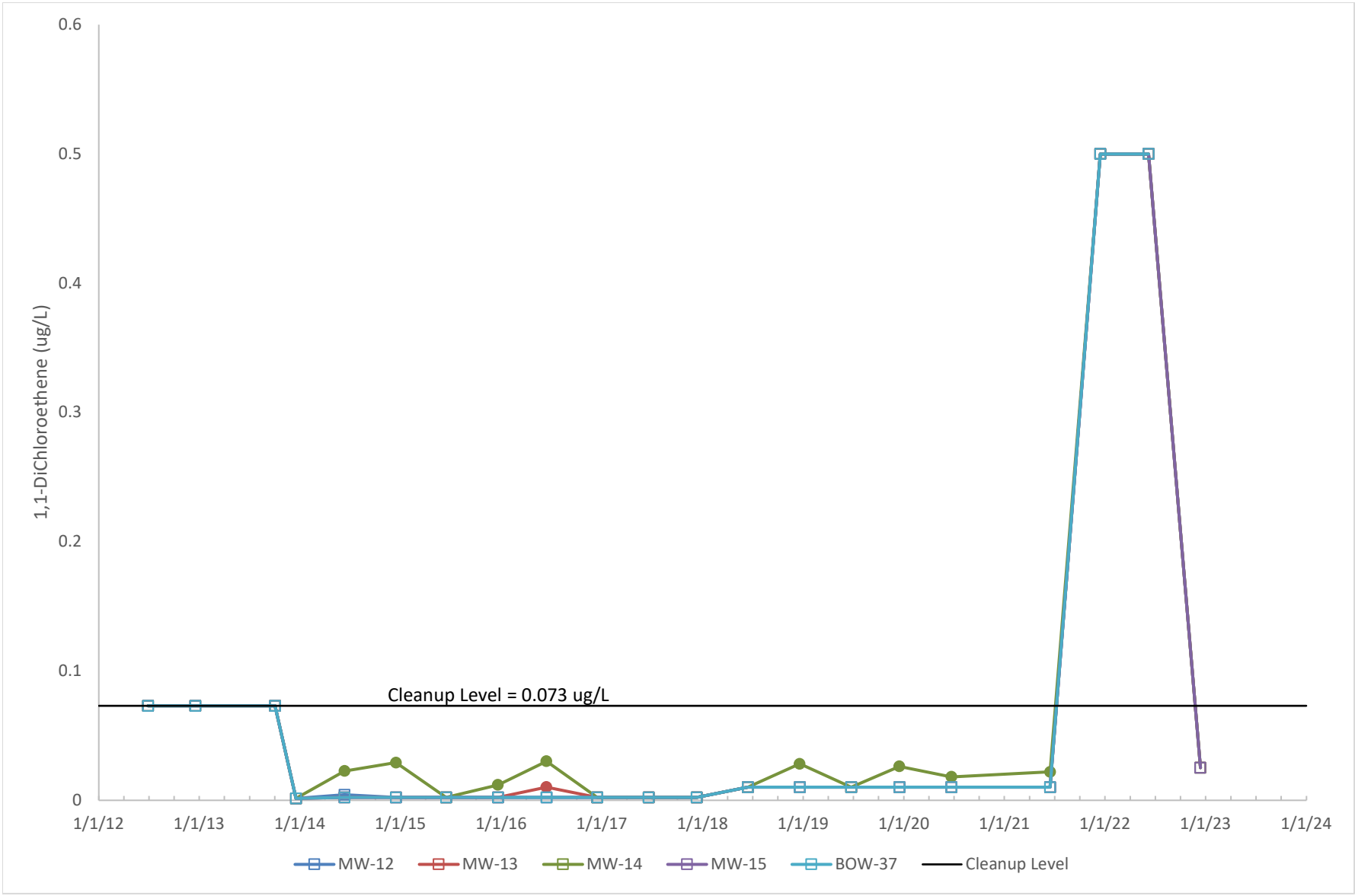

Figure E-6
1,1-Dichloroethene Concentrations in Groundwater
Fourth Five-Year Review Report
Bainbridge Island, WA

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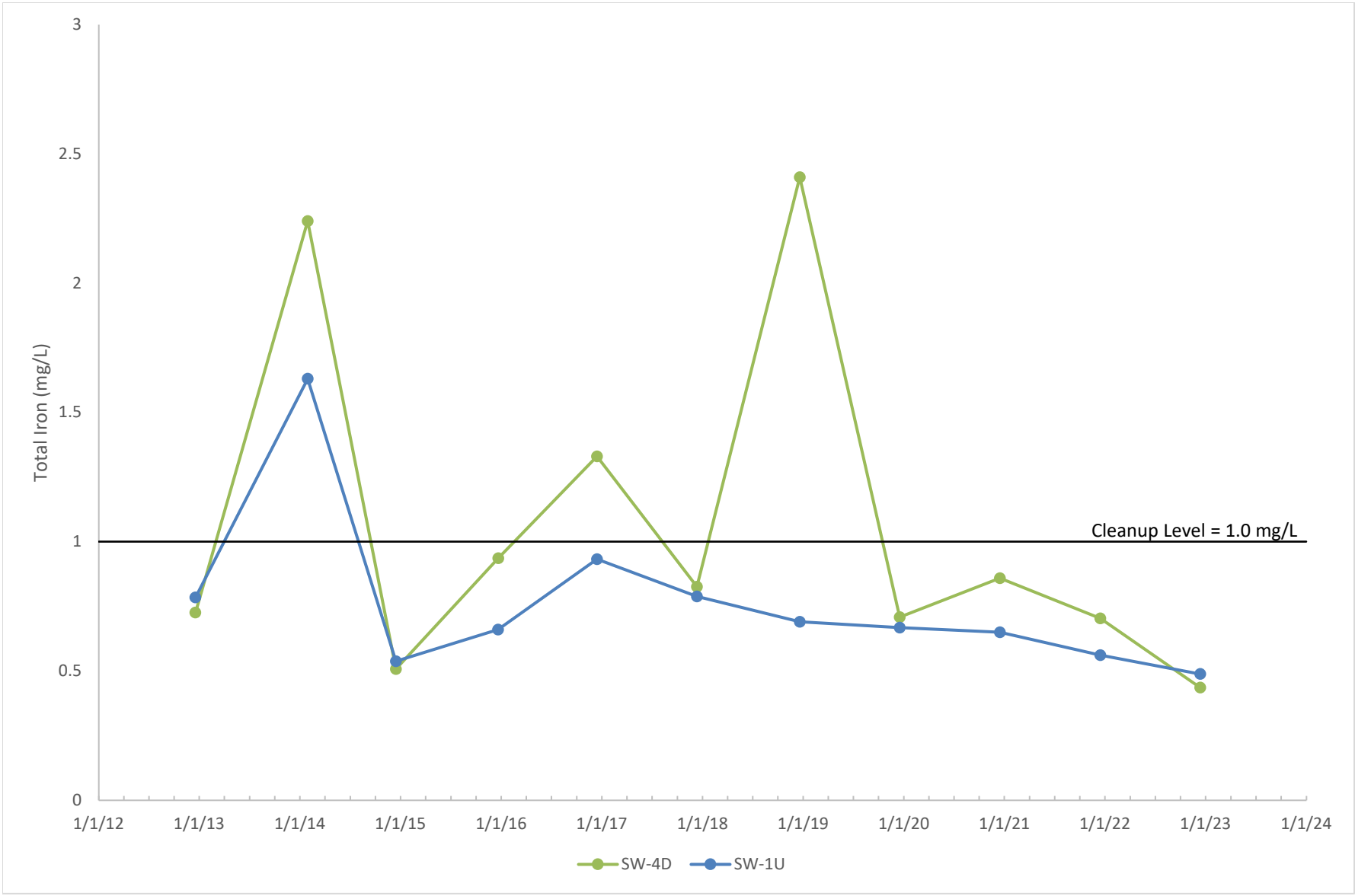

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Figure E-7
Total Iron Concentrations in Surface Water
Fourth Five-Year Review Report
Bainbridge Island, WA

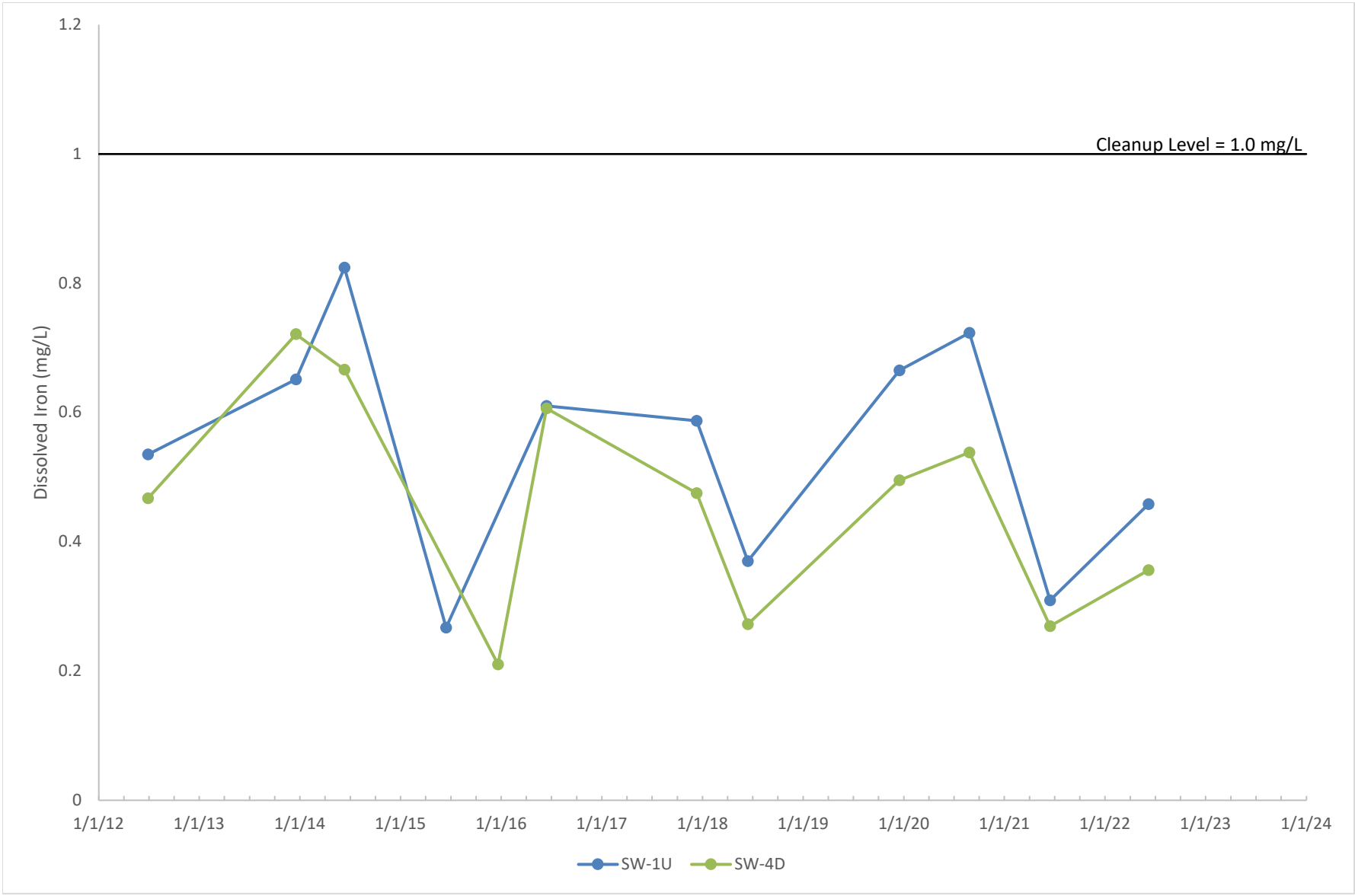

Figure E-8

Dissolved Iron Concentrations in Surface Water

Fourth Five-Year Review Report
Bainbridge Island, WA

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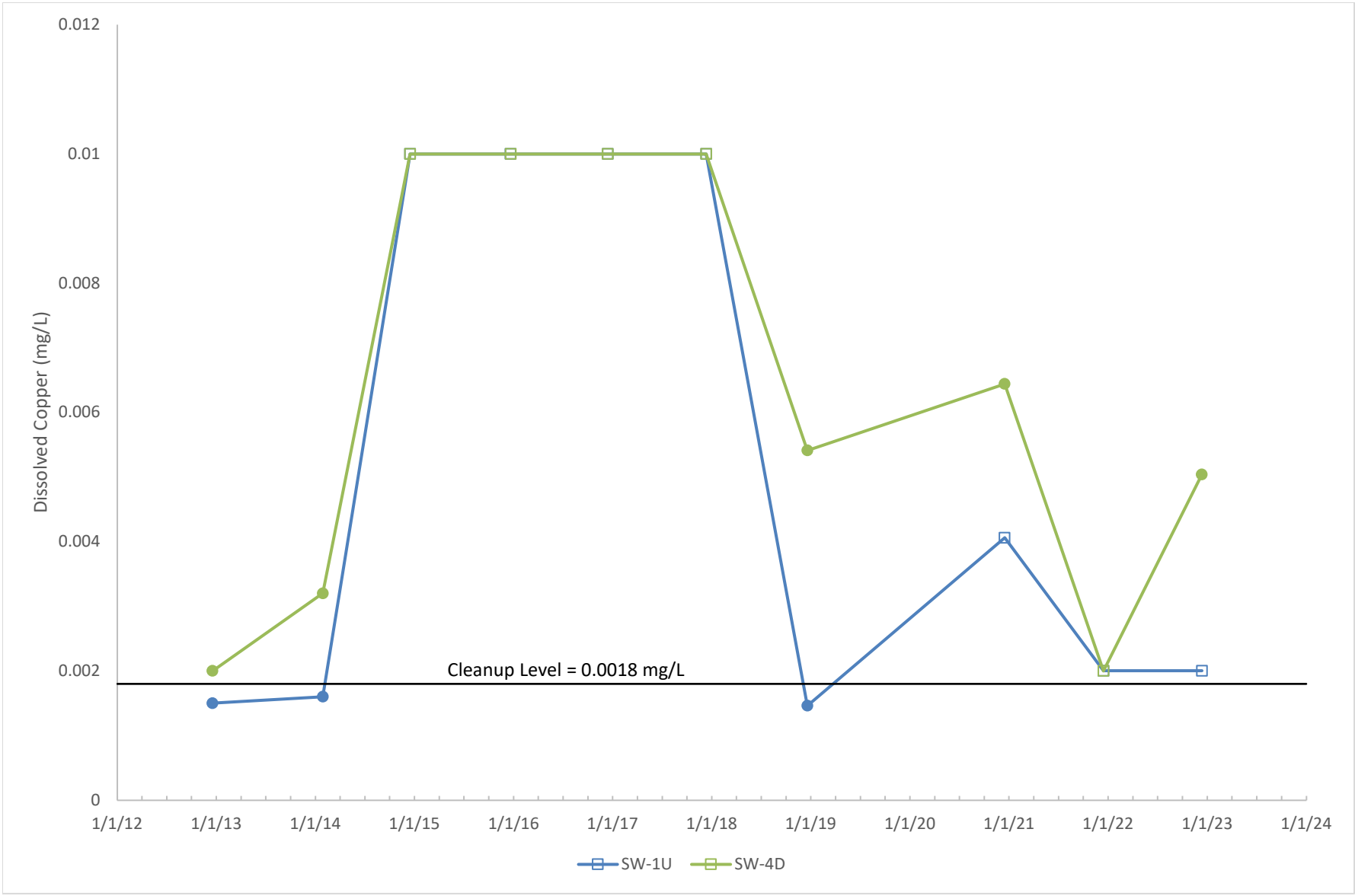

Figure E-9
Dissolved Copper Concentrations in Surface Water
Fourth Five-Year Review Report
Bainbridge Island, WA

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9/27/2023
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APPENDIX F

Beneficial Use Study Update

DRAFT MEMORANDUM

Project No. 120097

September 13, 2023

To: Aaron Claiborne, Engineering Project Manager, City of Bainbridge Island
Ellen Fairleigh, Operations Project Manager, City of Bainbridge Island

From:

Matthew M. Lewis, LHG
Project Hydrogeologist
mlewis@aspectconsulting.com

Peter S. Bannister, PE
Associate Engineer
pbannister@aspectconsulting.com

Re: **Bainbridge Island Landfill: Beneficial Use Survey - DRAFT**

Aspect Consulting, LLC (Aspect) completed an assessment of drinking water sources in the vicinity of the Bainbridge Island Landfill (Landfill, or Site) located at Vincent Road in Bainbridge Island, Washington (Site No. 2602; Figure 1). This technical memorandum is provided as part of the Fourth 5-Year Review Report required by the Washington State Department of Ecology (Ecology) to address data gaps identified in response to the Third 5-Year Review Report (Aspect, 2018) and focused manganese investigation (Aspect, 2020). For this memo, Aspect identified water supply wells within two miles of the Landfill and collected publicly available water quality data to:

- Calculate background manganese concentrations in local groundwater
- Identify potentially upgradient, cross-gradient, and downgradient water supply wells
- Assess the nature and extent of landfill effects as it pertains to manganese impacts

This work includes a review of the Washington State Department of Ecology (Ecology) well log database and Washington State Department of Health (WDOH) Source Water Assessment Program (SWAP) GIS database.

Manganese concentrations in groundwater near monitoring wells MW-13 and MW-14, located in the northeast corner Landfill, continue an increasing trend (with MW-13 exceeding cleanup levels), while the other compliance wells do not exhibit this trend and remain below regulatory cleanup levels (Aspect, 2020). This memo provides an evaluation of potentially impacted wells, based on the results of the online database search and groundwater flow assessment, and provides next-step recommendations.

Hydrogeologic Setting

The Site is located on a parcel in the middle west portion of Bainbridge Island, Washington (see Figure 1). Three aquifers were delineated during the remedial investigation (CH2M Hill,

2000): the Perched Aquifer, the Upper Aquifer, and the Lower Aquifer. The USGS refers to the Upper Aquifer as the "Qva" aquifer, and the Lower Aquifer as the "Sea Level" or QA1 aquifer (USGS, 2011). Additionally, the Glaciomarine aquifer (QA2) and Fletcher Bay aquifer (QA3) are mentioned below as locally used aquifers but are not considered in this report, due to their depth and substantial aquitards which limit the potential for vertical groundwater flow and transport.

- The **Perched Aquifer** consists of permeable sand and gravel and is underlain by lower permeability materials. It is located primarily northwest of the Site and is considered hydraulically isolated from the Upper Aquifer (CH2M Hill, 2000). Several nearby permit-exempt water wells are completed in the water-bearing lenses of this unit, but yields are generally small, and it is not used for larger water system supply.

- The **Upper Aquifer (Qva)** consists of glacial advance outwash sand or a mix of sand and gravel and is locally unconfined. It is a commonly used source of permit-exempt domestic water wells, however very few larger water system sources are completed in this unit. The bottom elevation of the Upper Aquifer is estimated to be about 100 elevation feet (USGS, 2011) and it is the primary aquifer monitored at the Landfill for impacts. A silt and clay aquitard separates the upper and lower aquifers.

- The **Lower Aquifer (QA1),** or Sea-level Aquifer, consists of a saturated sand unit but is much thinner than the upper aquifer and is generally confined. The upper elevation of the Lower Aquifer is estimated to be at about sea level. The Lower Aquifer has been described as virtually hydraulically isolated from the upper aquifer (CH2M Hill, 2000) by the 150-foot-thick aquitard. This aquifer is the most widely used source for water systems and permit-exempt wells.

- The **Glaciomarine (QA2)** and **Fletcher Bay (QA3)** Aquifers consist of varying amounts of gravel, sand, and silt and are hydraulically separated from the above aquifers by silt and clay aquitards. About 27 wells were found to be completed in these two aquifers within 2 miles of the Landfill. However, the Glaciomarine aquifer is not used as commonly as QA3 due to its more limited extent and lower permeability, and no water systems sources were observed to be completed in it within the search radius.

Groundwater Flow

Groundwater flow in the Upper Aquifer at the Site is from the south-southwest to north-northeast, and consistent with flow direction observed during the RI and Third 5-Year Review Report, except for June 2022 where groundwater elevations suggest a slightly north-northwest flow direction. Regional groundwater flow in the Lower Aquifer is described as flowing radially from higher elevation in the island interior down to the Puget Sound (USGS, 2011), or northeast from the Site towards Eagle Harbor.

Calculated Background Manganese Levels

WDOH provided a file of all water quality data from drinking water wells on Bainbridge Island within a 2-mile radius of the Landfill. The file consisted of water quality data from 92 locations, which were all determined to be water systems. To identify data that would be appropriate for defining background water quality for the Bainbridge Island Landfill, Aspect reduced the data file based on an initial review of water quality data and geologic setting.

Data Selection Process

The following provides the parameters for data selection and rationale for each step.

Initial Selection of Representative Water Quality Data

The initial review of the WDOH water quality database focused analysis of available data using the following parameter constraints:

- **Sample Collection Type.** Drinking water purveyors collect water samples from various sources or, sometimes in the case of well fields, a combination of sources. Only samples listed as being collected from a single source were selected so that the data are more representative of aquifer conditions. Samples listed as "blended" or "unknown," sources were not included in the analysis.
- **Availability of Manganese Data.** Total manganese is categorized as a secondary contaminant in Washington Administrative Code (WAC) 173-200-40, with a groundwater quality criteria standard (GWQC) of 0.05 milligrams per liter (mg/L). Given the contaminant's natural occurrence in glacial sediments, water systems must often sample for manganese among other metals. Only groundwater quality data with manganese results were included in the analysis and only the Lower Aquifer had enough manganese data (greater than eight data points) to conduct the statistical analyses necessary for determining local background concentrations. Data on manganese concentrations were publicly available for larger public and private water supply systems and were not publicly available for permit-exempt domestic water wells.
- **Reporting Limit.** Only samples with a reporting limit below the GWQC of 0.05 mg/L were included in the analysis. Since the standard reporting limit for manganese results within the last 20 years is 0.01 mg/L, only a few results were excluded based on this criterion.

Selection of Representative Water Quality Data Based on Geologic Setting

Based on a review of the regional geology, multiple wells were filtered out for further review because they are completed or likely completed within different hydrogeologic units, which can impart different geochemical signatures on groundwater. To account for this, data were further organized by Aquifer as discussed below. The following data sources were used in the process:

- **WDOH – Office of Drinking Water** electronic database of drinking water wells includes the well location, and depth.
- **Washington State Department of Natural Resources (DNR) LiDAR** data (https://www.dnr.wa.gov/lidar) was used to estimate surface elevation of the well location. This was then used to calculate the elevation of the well screen interval, based on the database listing for well depth.
- **DNR surficial geology data** is available through their Geologic Information Portal (https://www.dnr.wa.gov/geologyportal). Additional details, such as regional geologic cross sections, were reviewed from the Bainbridge Island Conceptual Model report (USGS, 2011).

For the remaining wells, the well completion depth and geology were estimated using GIS data and geology from the DNR. When loaded into GIS, the surface elevation of the well and surface geology information were exported from GIS and tabulated. However, because the local

topography varies widely and most well location information that DOH provided are listed at the centroid of the quarter-quarter section, well screen elevations (and therefore the aquifer they are completed in) should be considered approximate. Ground surface elevations were corrected where well address information was available.

A review of the local geology indicates that hydrostratigraphic units of interest, the Upper and Lower units, are above 100 feet and -200 feet in elevation, respectively. Wells determined to be completed in deeper hydrostratigraphic units, like the Glaciomarine and Fletcher Bay aquifers, were excluded from the background groundwater quality analysis because they are likely drawing older groundwater which can have more dissolved minerals and bias the concentrations high.

Selected Data

Using the data selection process outlined above, Aspect created a data set for statistical analysis: wells with manganese data from the last 10 years within two miles of the Landfill and completed between sea level and -200 elevation feet (targeting the Lower Aquifer).

The data selection process identified 22 public and private water supply system wells within a 2-mile radius of the Bainbridge Island Landfill. The overall average manganese concentration of the well data is 0.088 mg/L. Table 1 provides a summary of the available manganese data for the selected wells, including sample count and minimum, maximum, and average concentrations. Well locations with the average manganese concentration are presented on Figure 2.

Statistical Analysis

Statistical analyses were completed to develop an upper tolerance limit (UTL) or background threshold value to define the background concentration for the data set. A detailed discussion of the statistical analysis methods is provided in Appendix A. The UTLs represent the value below which 95 percent of the values are expected to fall within 95 percent confidence.

Statistical analyses completed were in general accordance with Ecology guidance documents (Ecology, 2005 and Ecology, 2018) and Unified Guidance (EPA, 2009,). This approach is also generally consistent with what Ecology completed for calculating regional background groundwater concentrations for arsenic (Ecology, 2022).

The selected regional wells listed in Table 1 have a variable number of sampling events ranging between 1 and 28 data points. To remove the potential for statistical bias towards wells with more sampling events, the average manganese concentration was calculated for each well. If only one data point was available, that value was carried forward in the statistical analysis.

For the regional well data, 40 percent of the data points in the data set were reported as “not detected”, and the reporting limit was used (see Table 3) in accordance with Unified Guidance (EPA, 2009). This incorporates the practical quantitation limit in the UTL calculation.

Results

Statistical results are summarized in Table 2. The local groundwater UTL is calculated at 0.341 mg/L in the Lower Aquifer, which is greater than the GWQC of 0.05 mg/L. Only one water system (Harbor Crest; WSID: 01832) has had manganese results in the last 10 years exceeding the calculated background concentration: in 2016 (0.362 mg/L) and 2019 (0.370 mg/L). Harbor Crest is

located about a mile east of the Landfill (cross-gradient), near Eagle Harbor and is interpreted to be not impacted by the Landfill. All other groundwater supply sources report manganese concentrations significantly lower than the calculated background level. Additionally, no relationship was observed between the distribution of manganese concentrations in water systems and their proximity to the Landfill.

The only water system source completed in the Upper Aquifer within two miles that had publicly available manganese data is Carden Country School (WSID: 06337). It is located about 1,500 feet north of the Landfill and reported only a non-detection (less than 0.05 mg/L) in 2019, and therefore is not considered impacted by the Landfill.

Beneficial Use Survey

The purpose of this beneficial use survey is to identify off-property water wells that have a potential to be impacted by the manganese exceedances observed at one on-property compliance well at the Landfill. The survey results are detailed below.

Results of the Ecology Well Log Database Search

Aspect conducted a search of Ecology's well log database to determine the number of water supply wells completed in the Perched, Upper, or Lower Aquifers installed within the last 20 years (2003 to 2022). The search revealed a total of 193 wells within 2 miles of the Landfill: 5 wells in the Perched Aquifer, 15 in the Upper, and 173 in the Lower. Well drilling regulations prohibit installation of wells within 1,000 feet of a landfill (see WAC 173-160-171). The Perched Aquifer is considered to be cross-gradient of the Landfill and isolated from the other aquifers (CH2M Hill, 2000). Among the 15 wells completed within the Upper Aquifer in the last 20 years, five were confirmed to be cross-gradient of the Landfill, leaving ten potentially downgradient wells, all of which are confirmed to be further downgradient than well BOW37, an off-property point of compliance monitoring well for the Landfill. The Lower Aquifer showed no impacts from the Landfill based on the background groundwater quality analysis described in the previous section.

Results of the SWAP Database Search

Aspect conducted a search of the SWAP GIS database to identify Group A or Group B drinking water wells or wellhead protection areas within the 2-mile radius of the Landfill. SWAP provides graphical representation of drinking water source wellhead protection areas to help protect drinking water sources from unintended contamination. Wellhead protection areas are delineated into zones based on groundwater time-of-travel criteria, which represent the length of time it would take a particle of water to travel from the zone boundary to the well. Wellhead protection zones are shown on Figure 1.

Aspect determined that 61 Group A or Group B water systems with 92 groundwater sources were identified within two miles of the Landfill. Some of these water systems may include springs (surface water) sources. The nearest water system source (BOW37 of Stetson Acres, no longer included as a source) serves as a downgradient point of compliance for the Landfill and sampling results are typically below detection. As mentioned above, only one water system (Harbor Crest, located 1 mile east of the Landfill) has exceeded the calculated background manganese concentration within the last 10 years, and it is located cross-gradient of the Landfill and completed in the Lower Aquifer. Therefore, the Harbor Crest well is interpreted to be not impacted by the Landfill.

Summary of Findings and Recommendations

Historical and existing remedial actions and engineering controls at the Landfill have protected off-property groundwater quality for beneficial uses. Based on findings summarized below, we do not see evidence that nearby water supply wells are at risk of manganese impacts from the Landfill.

- The naturally-occurring background manganese concentration in groundwater within a 2-mile radius of the Landfill is greater than the regulatory standard. The calculated background UTL is 0.34 mg/L, greater than the regulatory standard of 0.05 mg/L.

- The available groundwater quality data show no off-property impact of elevated manganese concentrations at one compliance well at the Landfill. Elevated manganese concentrations greater than the regulatory standard appear to be naturally occurring and are interpreted to be not impacted by the Landfill.

- Approximately 193 wells were constructed in the last 20 years within 2 miles of the Landfill: 5 wells in the Perched Aquifer, 15 wells in the Upper Aquifer, and 173 in the Lower Aquifer. Ten new wells in the Upper Aquifer wells were identified as being downgradient of the Landfill and are further from the Landfill than the off-property point of compliance well showing no impacts.

The manganese investigation conducted in 2020 (Aspect, 2020) concluded that landfill gas in the subsurface may be affecting groundwater geochemistry, dissolving and mobilizing naturally occurring manganese, and resulting in increasing concentrations at on-property compliance wells MW-13 and MW-14. We recommended that a soil gas survey be conducted.

Aspect implemented the soil gas survey during August and September 2023, and confirmed the presence of landfill gas below the waste. We recommend continued groundwater monitoring to demonstrate performance of passive landfill gas collection and venting.

References

Aspect Consulting, LLC (Aspect), 2018, Third Five-Year Review Report: Bainbridge Island Landfill, May 1, 2018.

Aspect Consulting, LLC (Aspect), 2020, Focused Investigation of Manganese in Groundwater: City of Bainbridge Island Landfill, October 9, 2020.

CH2M Hill, 2000, Bainbridge Island Landfill Remedial Investigation.

Environmental Protection Agency (EPA), 2009, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities-Unified Guidance, United States Environmental Protection Agency, EPA 530/R-09/007.

U.S. Geological Survey (USGS), 2011, *Conceptual Model and Numerical Simulation of Groundwater-Flow System of Bainbridge Island, Washington*. USGS Scientific Investigations Report 2011-5021.

Washington State Department of Ecology, 2005, Implementation Guidance for the Groundwater Quality Standards, Publication 96-02, revised 2005.

Washington State Department of Ecology (Ecology), 2018, Guidance for Monitoring at Landfills and Other Facilities Regulated Under Chapters 173-304, 173-306, 173-350, and 173-351 WAC, Publication 12-07-072, Revised December 2018.

Washington State Department of Ecology (Ecology), 2022, Natural Background Groundwater Arsenic Concentrations in Washington State, Publication No. 14-09-044, January 2022.

Washington Department of Natural Resources (DNR), Geologic Information Portal, accessed https://www.dnr.wa.gov/geologyportal, May 24, 2023.

Washington State Department of Health, Office of Drinking Water, Source Water Assessment Program (SWAP), accessed March 7, 2023, https://fortress.wa.gov/doh/swap/index.html

Limitations

Work for this project was performed for the City of Bainbridge Island (Client), and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Attachments:
Table 1 – Groundwater Manganese Concentration Statistics
Table 2 – Summary of Statistical Analysis
Figure 1 – Beneficial Use Survey Map
Figure 2 – Manganese Concentrations by Aquifer
Appendix A – Statistical Analysis Methods

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TABLES

Table 1. Groundwater Manganese Concentration Statistics

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Project No. 120097, Bainbridge Island Landfill
Bainbridge Island, WA

DOH WSID	Water System Name	Source Number	Manganese Results (mg/L)			# of Samples
			Min	Max	Mean	
00435	Clear Water	1	0.005	0.005	0.005	1
66936	Bucklin	2	0.004	0.250	0.017	41
01832	Harbor Crest	1	0.338	0.370	0.357	3
05369	Bainbridge Island Child Care Centers	1	0.045	0.080	0.065	3
16964	Place Eighteen HOA	1	0.100	0.200	0.145	4
23290	Emerald Heights	5	0.010	0.047	0.023	7
43887	Walden Water	1	0.060	0.080	0.070	6
66932	Rose Avenue Water Association	2	0.050	0.082	0.064	3
01031	Raven's Reach	1	0.005	0.011	0.009	5
81451	South Bainbridge	20	0.120	0.135	0.128	2
		19	0.010	0.020	0.015	2
		16	0.037	0.037	0.037	1
		13	0.092	0.092	0.092	1
97650	Bainbridge Island City of	1	0.099	0.099	0.099	1
		2	0.116	0.116	0.116	1
		3	0.094	0.094	0.094	1
		8	0.161	0.161	0.161	1
		9	0.097	0.097	0.097	1
		10	0.100	0.100	0.100	1
		11	0.094	0.094	0.094	1
AD456	Sugarmill	1	0.010	0.280	0.100	3

Notes:

This represents average manganese concentrations at DOH water system sources screened within the Lower Aquifer within 2 miles

All data is from within the last 10 years (2012-2022) and includes non-detect values (.01 mg/L).

Table 2. Summary of Statistical Analysis

Project No. 120097, Vincent Road Landfill, Bainbridge Island, Washington

	Total Results	Results Excluding Outlier
	Manganese	
95 95 Upper Tolerance Level (UTL) - mg/L	**0.341**	0.182
Groundwater Quality Criteria (mg/L)[1]	0.05	
Number of Wells	22	21
Minimum Value in mg/L	0.005	0.005
Maximum Value in mg/L	0.357	0.161
Number of Detects	22	21
Number of Non-Detects	0	0
% Detect	100%	100%
% Non-Detect	0%	0%
UTL Method	Gamma	Normal
Mean in mg/L	0.088	0.076
Median in mg/L	0.093	0.092
Standard Deviation	0.074	0.045
90th Percentile	0.143	0.128
95th Percentile	0.160	0.145
Coefficient of Variation (CV)	0.840	0.593
Skewness	2.285	0.033
p value	0.162	0.411

Notes:

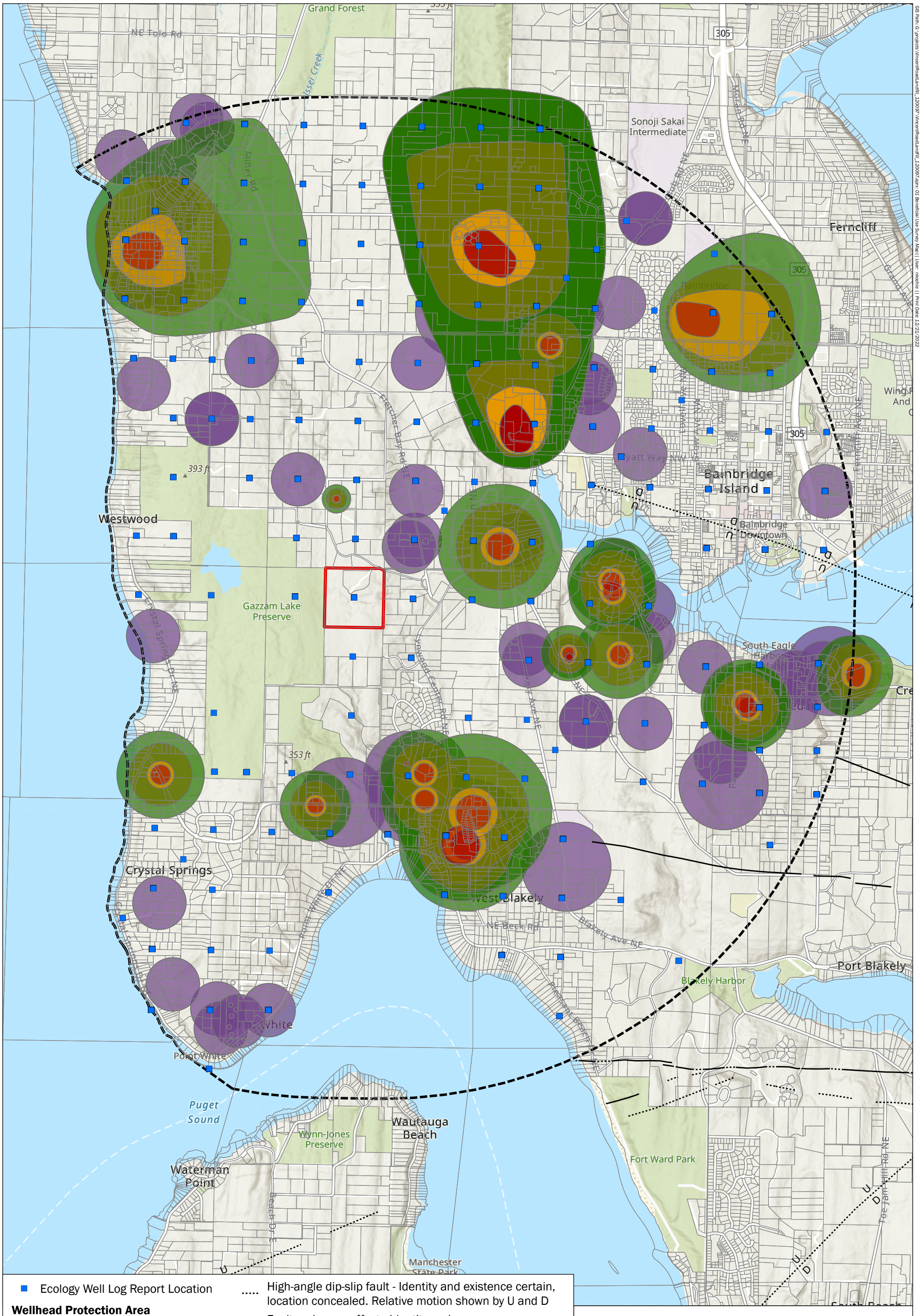
[1] Groundwater quality criteria are from Washington Administrative Code (WAC) 173-200, Table 1B: Secondary Contaminants

Statistical analyses were performed in accordance to the EPA Unified Guidance Document - Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (EPA, 2009).

EPA = U.S. Environmental Protection Agency, mg/L = milligrams per liter

Results excluding the outlier value is included for reference.

FIGURES



- Ecology Well Log Report Location

Wellhead Protection Area

- 6 Month TIme of Travel
- 1 Year TIme of Travel
- 5 Year TIme of Travel
- Assigned Time of Travel

- High-angle dip-slip fault - Identity and existence certain, location concealed. Relative motion shown by U and D
- Fault, unknown offset - Identity and existence certain, location accurate
- Fault, unknown offset - Identity and existence certain, location concealed
- 2 Mile Buffer
- Subject Property
- Kitsap County Parcel

N

0 1,000 2,000 Feet

Beneficial Use Survey Map

Vincent Road Landfill
City of Bainbridge Island, WA

DRAFT

Aspect CONSULTING	DEC-2022	BY: MML / NLK	FIGURE NO. 1
	PROJECT NO. 120097	REVISED BY: ---/---	

GIS Path: G:\projects\VincentRoadLandfill_120097\VincentRoadLandfill_120097.aprx; 01 Beneficial Use Survey Map | User: nkothe | Print Date: 12/21/2022

Data source credits: None || Basemap Service Layer Credits: County of Kitsap, WA State Parks GIS, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, Esri, NASA, NGA, USGS, FEMA

GIS Path: G:\projects\VincentRoadLandfill_120097\VincentRoadLandfill_120097.aprx: 02 Manganese Concentrations by Aquifer | User: nkoehle | Print Date: 7/11/2023

Walden Water
Well #1 AAC653 6"
0.070

Bainbridge Island City of
Fletcher Bay AAC733
0.035

Bainbridge Island City of
Sand Ave. #1 AAC875
0.022

Bainbridge Island City of
Sand Ave. #2 AAC876
0.026

Bainbridge Island Child Care Cntrs
Well #1
0.065

South Springridge Water Association
Well #1
0.036

Bainbridge Island City of
Head of Bay #6 AAC874
0.100

Bainbridge Island City of
Head of Bay #5 AAC873
0.097

Bainbridge Island City of
Head of Bay #3 AAC871
0.094

Bainbridge Island City of
Head of Bay #4 AAC872
0.161

Bainbridge Island City of
Head of Bay #1A AAC860
0.094

Bainbridge Island City of
Head of Bay #1 AAC869
0.099

Bainbridge Island City of
Head of Bay #2 AAC870
0.116

Carden Country School
Well #1
0.01

Bucklin
Well #2 AES320
0.017

Place Eighteen HOA
Well #1
0.145

Harbor Crest
Well #1
0.357

Island Utility
WF (S01, S02 & S03)
0.057

Raven's Reach
Well #1
0.009

Sugarmill
Well #1 BSC287
0.100

South Bainbridge
WF (S22, S23, S24) Island Utility
0.057

Rose Avenue Water Association
Well #2 ACP291 6"
0.064

Clear Water
Clear Water
0.005

Emerald Heights
WF (S01,3,4,6&) CT6
0.023

South Bainbridge
Well #9
0.037

South Bainbridge
Well #10 BKY882
0.128

South Bainbridge
Lynnwood #7
0.092

South Bainbridge
Lynnwood Wellfield
0.015

U D

N

0 1,000 2,000
Feet

Manganese Results by Aquifer

Upper Aquifer (Qva)
- Group A

Lower Aquifer (QA1)
- Group A
- Group B

Fletcher Bay Aquifer (QA3)
- Group A

- Fault, unknown offset - Identity and existence certain, location accurate
- Fault, unknown offset - Identity and existence certain, location concealed
- High-angle dip-slip fault - Identity and existence certain, location concealed. Relative motion shown by U and D
- Kitsap County Parcel
- 2 Mile Buffer
- Subject Property

Geologic Units 24k

Quaternary Rocks and Deposits
- Quaternary bog, marsh, swamp, or lake deposits
- Holocene artificial fill and modified land
- Quaternary alluvium
- Quaternary mass-wasting deposits
- Pleistocene continental glacial drift
- Pleistocene continental glacial till
- Pleistocene glacial and nonglacial deposits

Tertiary Rocks
- Tertiary sedimentary rocks and deposits
- Tertiary volcanic and sedimentary rocks

Water
- Water

Crystal Springs
Spring
0.01
← Water System Name
← DOH Source Name
← Average Mn Concentration

Notes:
- Manganese concentrations are in mg/L and represent the average result at each source.
- Water system information and groundwater quality data were gathered from the Department of Health database.

Manganese Concentrations by Aquifer

Vincent Road Landfill
City of Bainbridge Island, WA

DRAFT

Aspect CONSULTING	JUL-2023	BY: MML / NLK	FIGURE NO. 2
	PROJECT NO. 120097	REVISED BY: ---/---	

Data source credits: None || Basemap Service Layer Credits: Esri, NASA, NGA, USGS, FEMA

APPENDIX A

Statistical Analysis Methods

Statistical Analysis Methods

Statistical analyses were completed to develop an upper tolerance limit (UTL) or background threshold value to define the background groundwater concentrations for the City of Bainbridge Island, Vincent Road Landfill. The following provides a detailed discussion of the statistical methods used in development of these UTLs.

As discussed in the main text of this memorandum, data for statistical analysis were selected from a drinking water data set provided by the Washington State Department of Health. For this report, the statistical analyses were performed on one manganese data set representing the publicly available data for water systems within two miles of the landfill collected in the last 10 years (2012 to 2022). The following outlines the assessment of the data distribution and subsequent UTL calculations.

Statistical analyses of the groundwater quality data were performed using the software program ProUCL version 5.2.00 (EPA, 2022). Analyses completed were in general accordance with Ecology guidance documents (96-02, Implementation Guidance for Groundwater Quality Standards and 12-07-072, Guidance for Monitoring at Landfills and Other Facilities Regulated Under Chapters 173-304, 173-306, 173-350, and 173-351 WAC) and Unified Guidance (EPA, 2009, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities-Unified Guidance, United States Environmental Protection Agency, EPA 530/R-09/007).

Outlier Tests

Outlier tests (Dixon's Test) were used to determine if there were any results that were statistically distinct from the population represented by the remainder of the dataset. EPA's Unified Guidance (EPA, 2009) recommends that observations appearing abnormally high be formally evaluated with outlier tests, but only be considered invalid and removed from consideration in the datasets if a specific physical reason can be identified for the abnormal value.

A review of the one data set indicated the regional data set possibly contained an abnormally high data point. Outlier tests on the regional data set identified one high value that was determined to be a statistically significant outlier. This data point represents the average of three sampling events completed at Harbor Crest water system, where concentrations ranging between 0.338 and 0.367 mg/L were observed during three discrete sampling events conducted between 2013 and 2019. The concentrations are consistent over time, and do not represent invalid data, and are therefore included in the UTL evaluation. Additional data were not available to confirm the reproducibility of the manganese concentrations recorded for these wells.

Goodness-of-Fit

Prior to calculation of the UTL, a goodness-of-fit evaluation is completed to assess data distribution style. The data was evaluated for goodness-of-fit using Q-Q plots to

determine if data have a normal, lognormal, or gamma distribution (parametric distribution), or do not fit a discernible distribution (non-parametric distribution). The goodness-of-fit evaluation was completed using both non-detects and excluding non-detects to evaluate the distribution of the data sets. The resulting Q-Q plots and goodness-of-fit statistical outputs are attached.

The regional data set fits a gamma distribution at 0.05 significance level. The dataset used to perform the statistical analysis for determining the UTL included the statistically significant outlier. The gamma p-value was calculated based on the Anderson-Darling test statistic to evaluate the goodness-of-fit. The p-values for the other distributions were compared to evaluate the greatest statistical significance, and the distribution with the larger p-value was used as it suggests the best fit distribution for the dataset. In this data set, there were detections at each sampling location throughout the duration, so the dataset does not include any non-detect values.

Upper Tolerance Limit (UTL)

Based on the distribution of the dataset, the dataset was used to develop a UTL or background threshold value (BTV) to define the background concentration for the dataset interval. The UTLs represent the value below which 95% of the values are expected to fall with 95% confidence.

If the distribution of the dataset was normally, log-normally or gamma distributed, parametric methods were used to develop the UTL. If the dataset was not normally, log-normally, or gamma distributed, non-parametric methods were used to develop the UTL. UTLs are summarized in Table 2 of the main text.

References

U.S. Environmental Protection Agency (EPA), 2009, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530/R-09-007, March 2009.

U.S. Environmental Protection Agency (EPA), 2022, ProUCL version 5.2, June 2022.

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APPENDIX G

Soil Gas Investigation Findings

MEMORANDUM

Project No. 120097

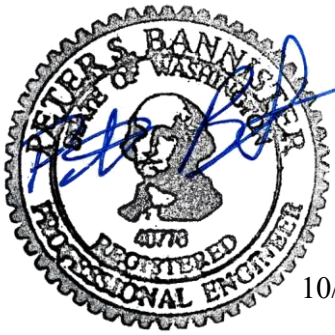
October 31, 2023

To: Aaron Claiborne and Ellen Fairleigh, City of Bainbridge Island

From:

10/31/2023

MATTHEW M. LEWIS



10/31/2023

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Re: **Bainbridge Island Landfill: Soil Gas Survey Results**

Aspect Consulting, LLC (Aspect), prepared this memorandum for the City of Bainbridge Island (City) to describe the gas probe/vent installation and the soil gas survey at the Vincent Road Landfill (Landfill), as outlined in the Soil Gas Survey and Vent Installation Work Plan (Work Plan) (Aspect, 2023). The gas probe/vent installation and the soil gas survey were part of the recommendations detailed in the Focused Manganese Investigation memorandum (Aspect, 2020) that was prepared as part of an ongoing cleanup action conducted under the supervision of the Washington State Department of Ecology (Ecology) and in accordance with the Model Toxics Control Act (MTCA). This memorandum is organized to first present the summary of findings, activities, and recommendations followed by details and recommendations.

Summary of Findings, Activities, and Recommendations

Carbon dioxide and methane were observed during a soil gas survey at the Landfill. The presence and concentrations of these gases likely influence geochemical conditions affecting the water quality observed at compliance monitoring wells, namely dissolved manganese at BMW-13. The source of these gases is decomposition of the material retained following the 2001 removal action as part of the MTCA cleanup action. Observed methane concentrations spanned the explosive range, so air dispersion is key to mitigating explosion risk. The stacked column graph on Figure A shows the range of concentrations for methane and carbon dioxide observed at four new gas probe/vents installed for this survey.

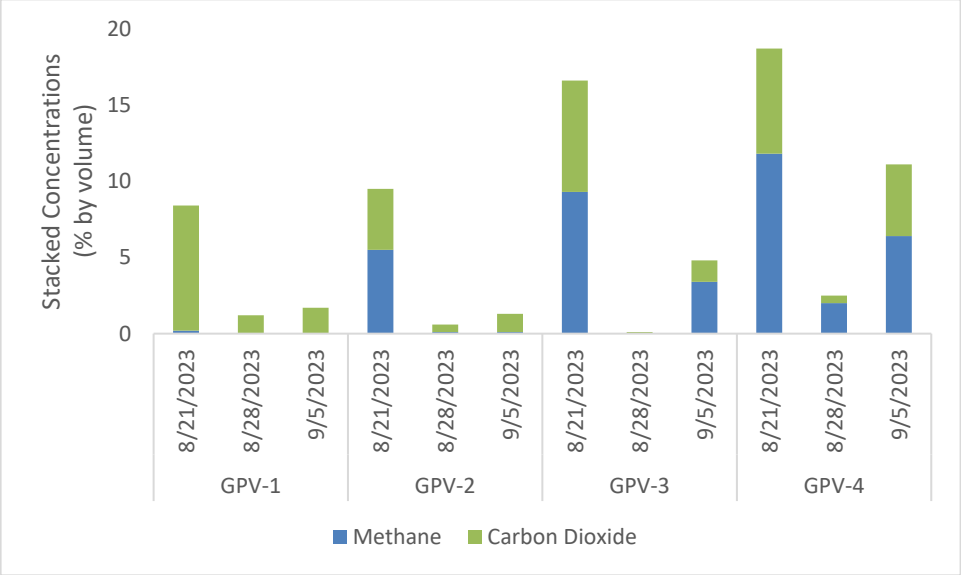


Figure A: Soil Gas Survey Results

The probe installation and soil gas survey are summarized below:

- Four new gas probe/vents (labeled GPV-1 through GPV-4 on Figure 1) were installed in accordance with drilling regulations (Washington Administrative Code [WAC] 173-160). All gas probe/vents are located within the mapped extent of materials retained following the 2001 removal action, as shown on Figure 1. Borings were advanced to 50 feet below ground surface (bgs) using hollow-stem auger drilling methods with soil samples collected every 10 feet.

- Gas probe/vents were constructed of 2-inch-diameter schedule 40 PVC pipe with screen intervals from approximately 5 feet below the soil cover, across the waste thickness, and into native soils beneath the waste. The annulus around the gas probe/vents was backfilled with clean sand to 2 feet above the top of screen and a bentonite/concrete surface seal. The probes were completed with steel stick-up monuments with hinged lids and protective bollards.

- Following gas probe/vent installation, Aspect monitored soil gas concentrations once per week for 3 weeks to survey methane and carbon dioxide. Soil gas measurements were collected with a multigas field meter until they stabilized or three casing volumes were removed. A solar-powered fan was installed at each probe following the first monitoring event in an attempt to promote venting landfill gas to the atmosphere.

Based on findings, Aspect's recommendations include the following:

- Allow gas probes/vents to remain uncapped and passively vent landfill gases during barometric pressure changes. This may prevent accumulation of landfill gases between the waste and groundwater, thereby reducing geochemical effects on groundwater that have resulted in elevated manganese at compliance wells.

- Install a biofilter at each passively venting gas probe to reduce greenhouse gas emissions. An image of a biofilter installed to treat landfill gas is shown on Figure B.

Figure B. Biofilter installed at Jefferson County Landfill

- Review long-term groundwater monitoring data to assess the performance of the new gas probe/vents, and determine the need for additional vents.

Drilling and Gas Probe Installation

Drilling and gas-probe installation were described in the Work Plan. The gas probes/vents were located within the extent of materials retained following the 2001 removal action, and were spaced approximately 200 feet apart, except GPV-4 that is 100 feet from GPV-3.

The City contracted Holt Services, Inc. (Holt), to conduct the drilling and probe construction. Drilling started on August 16, 2023. Each boring was advanced using hollow-stem auger techniques to 50 feet bgs with split-spoon samples taken every 10 feet to estimate debris thickness. Aspect measured landfill gas concentrations with a multigas meter (GEM5000+) in the auger stem and breathing space to ensure personnel safety during drilling. An Aspect representative documented observed conditions during drilling on field boring logs that are provided in Appendix A. Soil cuttings were stockpiled on plastic sheeting and covered until disposal by the City.

Each of the four probes were constructed using a 2-inch-diameter schedule 40 PVC with a screen interval of 7.5 to 47.5 feet bgs and a slot size of 0.050 inches. The annular space in the borehole was backfilled with sand from about 5 feet bgs to 50 feet bgs. The probes were completed with a standard surface seal, an aboveground monument with a hinged lockable lid, and bollards to protect the probe monument from vehicular traffic in accordance with state regulations. Gas probe/vent installation was completed on August 18, 2023. An Aspect representative documented gas probe/vent construction on as-built well completion diagrams that are provided in Appendix A.

Bentonite was observed within GPV-4 following installation indicating the specifications in the Work Plan were not met. Holt overdrilled GPV-4 on September 13, 2023, and constructed a replacement gas probe/vent in the same boring.

Soil Gas Survey

Starting on August 21, 2023, Aspect conducted a soil gas survey once a week for 3 weeks to measure the landfill gas in the deep vadose zone at the four new gas probes. A summary of representative soil gas concentrations is presented in Table 1. During each monitoring event, a supplemental air pump was used to purge the probe at a rate of approximately one casing volume every 6 minutes. An Aspect representative measured gas concentrations using a calibrated field instrument (GEM-5000), and recorded measurements on field sheets every quarter-casing volume (see Appendix A). Following the first soil gas survey, a solar-powered fan was installed at each probe in an attempt to promote venting landfill gas to the atmosphere. However, these fans appear to be underpowered to fully offset the effects of rising barometric pressure.

Soil gas survey results presented in Table 1 are interpreted below.

- Methane concentrations reflect the degree of anaerobic conditions, whereas carbon dioxide can be generated during aerobic or anaerobic conditions. Observed conditions were most anaerobic near GPV-4 and most aerobic near GPV-1.

- Methane and carbon dioxide concentrations in Table 1 reflect the degree of landfill gas generation proximal to the gas probe/vent. Observed methane and carbon dioxide were highest at GPV-4 and lowest at GPV-1.

- Oxygen content reflects the degree of atmospheric air entering the landfill during rising barometric pressure events. The highest oxygen concentrations were observed during the second monitoring event conducted near the end of a long-term rising barometric pressure cycle.

- Balance gas concentrations are calculated as 100 percent minus the concentrations of methane, carbon dioxide, and oxygen. Balance gas reflects primarily nitrogen. Observed balance gas concentrations were elevated during the first and third monitoring events, perhaps reflecting the uptake of oxygen introduced during the previous barometric pressure cycle.

- Carbon monoxide concentrations above 100 parts per million (ppm) can be an indicator of subsurface combustion. Observed carbon monoxide concentrations were 11 ppm or less, and indicated normal decomposition.

- Hydrogen sulfide can be generated during extremely anaerobic decomposition. The permissible exposure limit for hydrogen sulfide is 20 ppm. Observed hydrogen sulfide concentrations were 1 ppm or less, indicating little if any hydrogen sulfide generation.

The observed soil gas concentrations are interpreted to represent conditions below the waste. Based on observations during drilling, the waste materials had lower permeability (due to the high fraction

of organic content) than native soils beneath the waste. Therefore, the waste materials contributed less gas than the underlying native soils during purging and monitoring.

Recommendations

Based on observed gas concentrations, Aspect recommends allowing passive venting at the four new gas probes. The concentrations observed indicate that landfill gas is being generated and accumulating between the bottom of waste and groundwater. Allowing the landfill gas to vent should reduce gas concentrations and geochemical effects on groundwater, thereby improving groundwater quality at compliance wells downgradient of the Landfill. Observed methane concentrations spanned the explosive range. Air dispersion and restricted access are important to mitigating explosion risk.

Aspect also recommends installing a biofilter at each gas probe to reduce greenhouse gas emissions. Soil gas survey results show anaerobic decomposition is still occurring within the retained materials, based on methane concentrations observed at three of the four gas probe/vent locations. Methane has a global warming potential 25 times greater than carbon dioxide. Biofilters are effective at converting methane to biological mass and carbon dioxide using naturally occurring microbiological communities. The methane concentrations at the biofilter surface are typically lower than the regulatory goal of 25 percent of the lower explosive limit (1.25 percent by volume).

Lastly, Aspect recommends reviewing long-term compliance monitoring data to assess the effectiveness of passive venting and decide if additional vents are warranted. To reduce gas concentration most effectively between the bottom of waste and groundwater, any future gas probe/vents should be completed in the native soils underlying the lower-permeability waste materials.

References

Aspect Consulting, LLC (Aspect), 2020, Focused Investigation of Manganese in Groundwater: City of Bainbridge Island Landfill, October 9, 2020.

Aspect Consulting, LLC (Aspect), 2023, Vincent Road Landfill: Soil Gas Survey and Vent Installation Work Plan, August 9, 2023.

Limitations

Work for this project was performed for the City of Bainbridge Island (Client), and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Attachments: Table 1 – Summary of Soil Gas Survey Results
Figure 1 – Site Plan with Soil Gas Probes
Appendix A – Boring Logs, As-built Well Completion Diagrams, Gas Probe Data Sheets

V:\120097 COBI - Vincent Road Landfill\Deliverables\Fourth 5 Year Review Report\Gas Probe Tech Memo\Gas Probe Install Tech Memo_FINAL_2023.10.31.docx

TABLE

Table 1. Soil Gas Survey Results

Project No. 120097, Bainbridge Island Landfill, Washington

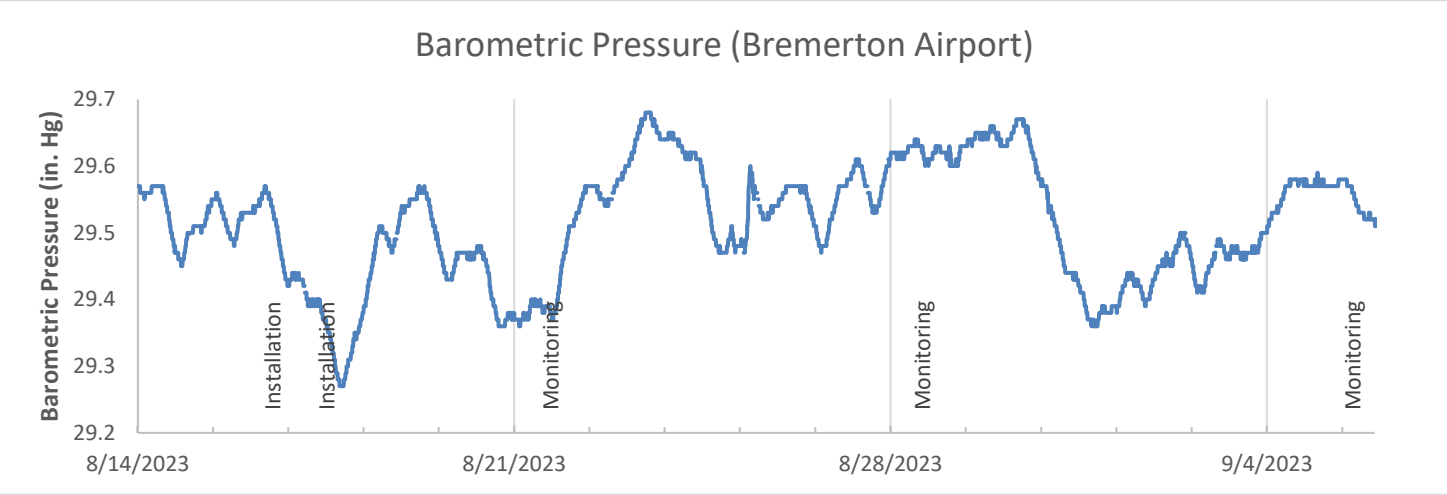
Gas Probe/ Vent ID	Monitoring Date	Barometer (inches Hg)	Methane (% volume)	Carbon Dioxide (% volume)	Oxygen (% volume)	Carbon Monoxide (ppm)	Hydrogen Sulfide (ppm)	Balance (% volume)
GPV-1	8/21/2023	29.61	0.2	8.2	7.0	1	1	84.6
	8/28/2023	29.84	0.0	1.2	19.2	0	0	79.6
	9/5/2023	29.72	0.0	1.7	13.6	0	1	84.7
GPV-2	8/21/2023	29.60	5.5	4.0	0.0	10	0	90.5
	8/28/2023	29.84	0.1	0.5	19.8	0	0	79.6
	9/5/2023	29.73	0.1	1.2	9.1	1	0	89.6
GPV-3	8/21/2023	29.60	9.3	7.3	0.3	3	0	83.1
	8/28/2023	29.84	0.0	0.1	20.6	0	0	79.3
	9/5/2023	29.71	3.4	1.4	8.8	8	0	86.4
GPV-4	8/21/2023	29.60	11.8	6.9	1.8	11	0	79.5
	8/28/2023	29.84	2.0	0.5	19.5	4	0	78.0
	9/5/2023	29.70	6.4	4.7	4.1	11	0	84.8

Notes:

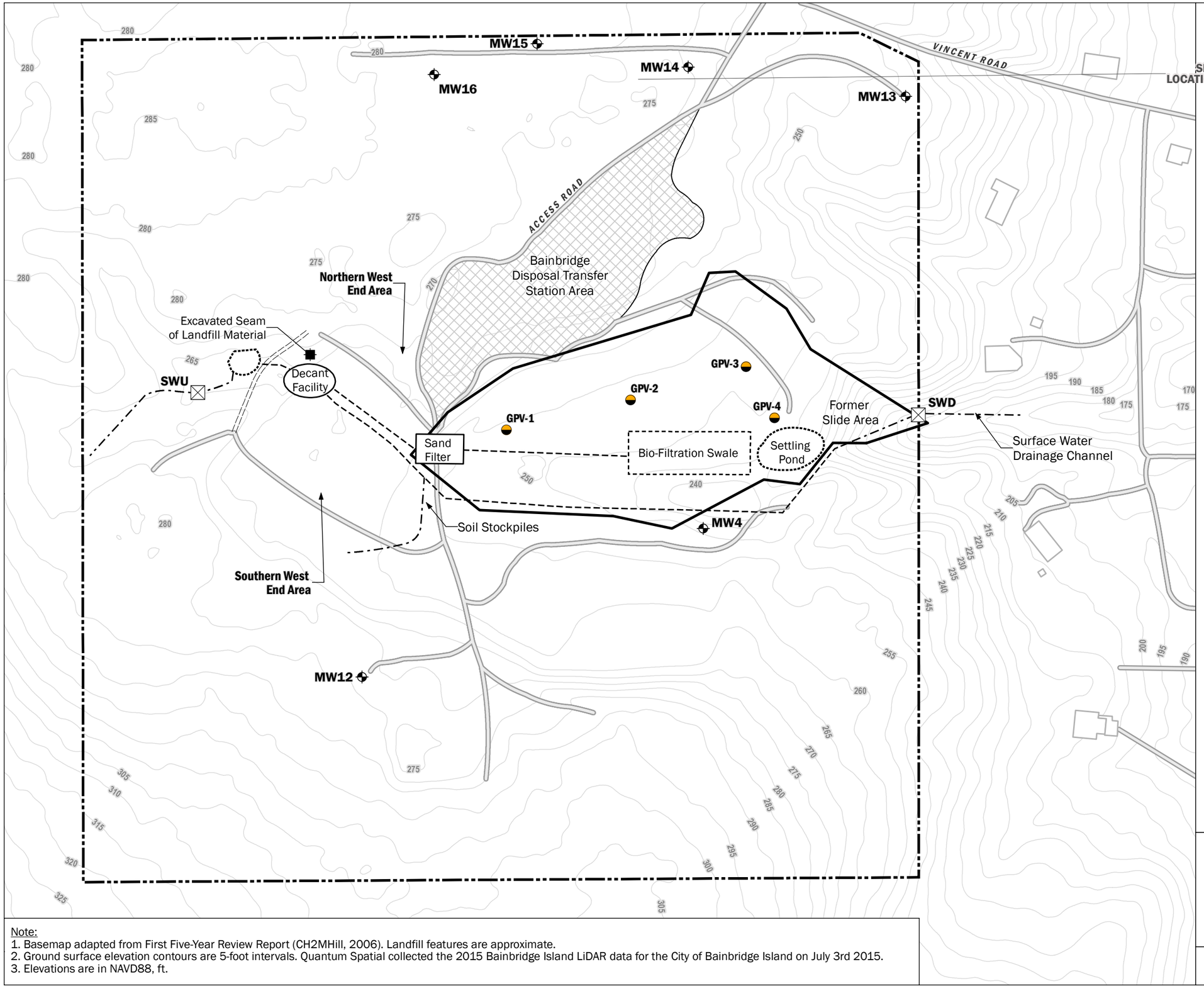
All readings were collected during periods of falling or stable barometric pressure to ensure representative soil gas values

All values are reported at the peak recorded CO2 reading during a purge of three casing volumes of air or stabilization, whichever came first

Complete soil gas records are in the soil gas survey field forms.



FIGURE



- Soil Gas Probes/Vents
- Monitoring Well
- Surface Water Sampling Location
- Surface Water Drainage Channel
- Approximate Location of Surface Water Diversion Pipe (Buried)
- Property Boundary
- Approximate Outline of Final Cover Based on Design Limits
- Approximate Outline of Pond
- Gravel or Paved Road
- Existing Structure

N

0 150 300
Feet

Note:
1. Basemap adapted from First Five-Year Review Report (CH2MHill, 2006). Landfill features are approximate.
2. Ground surface elevation contours are 5-foot intervals. Quantum Spatial collected the 2015 Bainbridge Island LiDAR data for the City of Bainbridge Island on July 3rd 2015.
3. Elevations are in NAVD88, ft.

Site Plan with Soil Gas Probes

Soil Gas Survey Results
Bainbridge Island Landfill
Bainbridge Island, Washington

Aspect Consulting	SEP-2023	BY: MLK / KES	FIGURE NO. 1
	PROJECT NO. 120097-0003	REVISED BY: MML / SCC	

GIS Path: G:\projects\VincentRoadLandfill_120097\Delivered\Soil Gas Survey Results\01 Site Plan with Soil Gas Probes.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 9/26/2023 || User: scudd || Print Date: 9/26/2023

APPENDIX A

Boring Logs, As-built Well Completion Diagrams, Gas Probe Data Sheets

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BORING LOG

SHEET 1 OF 3

LOCATION OF BORING: North Corner	PROJECT NO.: 120097
	PROJECT NAME: COBI Vinient Rd. Landfill
BORING NO.: Vent 1	
SKETCH OF LOCATION: N ↑	DRILLING METHOD: HSA
	LOGGED BY: Carmen
	DRILLER: Holt (Kevin Bacon) Mobile B58
	SAMPLING METHOD: SPT (diameter 2")
	HAMMER WEIGHT/SAMPLER DIAMETER: 140 lbs
	OBSERVATION WELL INSTALL: YES X NO ____ LFG
DATUM	GRADE ELEV.
	CASING DEPTH

	START	FINISH
WATER LEVEL	no water	
TIME	1110	TIME 0920 / 1100
DATE	8/10/23	DATE 8/10/23 / 8/10/23

SURFACE CONDITION: Grass / Burned grass

FIELDSCREENING										
ENV. SAMPLE TIME	PID (ppm)	SHEEN	SAMPLE NO. / SAMPLE TYPE	SAMPLE DEPTH	INCHES DRIVEN / INCHES RECV'D	DEPTH IN FEET	PENETRATION RESISTANCE	USCS SUMMARY	DESCRIPTION: Density, moisture, color, minor, MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. DRILL ACTION
						1			Burned grass
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						10			SILTY SAND
	2441	SS			18 / 11		26	SM	top 6" - Slightly moist/dry, brown, dense
						1	22		F Sand, organics - roots
							9	SP SM	SAND w/ SILT
						2			· F Sand, moist, dense, gray, no plastic
									· no odor
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						10			

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BORING LOG

SHEET 2 OF 3

LOCATION OF BORING	PROJECT NO. 120097	BORING NO. Vent 1
	PROJECT NAME	
SKETCH OF LOCATION: Seep 9 1.	DRILLING METHOD:	
	LOGGED BY:	
	DRILLER:	
	SAMPLING METHOD:	
	HAMMER WEIGHT/SAMPLER DIAMETER	
	OBSERVATION WELL INSTALL YES ____ NO ____	START / FINISH
	WATER LEVEL	TIME / TIME
	TIME	
	DATE	DATE / DATE
DATUM	GRADE ELEV.	CASING DEPTH

SURFACE CONDITION

DESCRIPTION: Density, moisture, color, minor, MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. DRILL ACTION

FIELDSCREENING: ENV. SAMPLE TIME	PID (ppm)	SHEEN	SAMPLE NO. / SAMPLE TYPE	SAMPLE DEPTH	INCHES DRIVEN / INCHES RECV'D	DEPTH IN FEET	PENETRATION RESISTANCE	USCS SUMMARY	DESCRIPTION
	0.0	SS			18/3	0	4	SM	SILTY SAND
						1	3		• moist, gray, loose
							4		• F Sand, nonplastic, no odor,
						2			• trace F-gravel SubR
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						30			SILT w/ SAND
	0.0	SS			18/16	1	5	ML	• moist, gray, Stiff
							16		• F Sand, no odor,
						2	8		
						3			@ 33 ft - little harder drilling.
						4			
						5			
						6			
						7			
						8			
						9			
						40			

GEM
CH4 : 0.3 %
CO2 : 1.1 %

47.5 > 40ft screen
7.5

10 ft riser pipe
2.5 ft out of

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BORING LOG

SHEET 3 OF 3

LOCATION OF BORING	PROJECT NO. 120097	BORING NO. Vent 1
	PROJECT NAME	
SKETCH OF LOCATION: See pg 1.	DRILLING METHOD:	
	LOGGED BY:	
	DRILLER:	
	SAMPLING METHOD:	
	HAMMER WEIGHT/SAMPLER DIAMETER	
	OBSERVATION WELL INSTALL YES ____ NO ____	START / FINISH
	WATER LEVEL / TIME / DATE	TIME / TIME / DATE / DATE
DATUM	GRADE ELEV.	CASING DEPTH

SURFACE CONDITION

DESCRIPTION: Density, moisture, color, minor, MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. DRILL ACTION

ENV. SAMPLE TIME	PID (ppm)	SHEEN	SAMPLE NO. / SAMPLE TYPE	SAMPLE DEPTH	INCHES DRIVEN / INCHES RECV'D	DEPTH IN FEET	PENETRATION RESISTANCE (40ft)	USCS SUMMARY	
	0.0	SS			18/16	1	25, 40, 36	ML	SILT w/ SAND • moist, gray, hard • F Sand, no odor, thin black bands @ 40.2', 40.4', 40.72', non plastic
						2			
						3			
						4			
						5			
						6			native
						7			
						8			
						9			
	0.0	NS			18/17	50	24, 32, 50/10"	SP-SM	SAND w/ SILT • moist, gray, Very dense • F-C Sand, no odor,
						1			
						2			
						3			• bottom of boring @ 50.4 ft bgs -Screen from 47.5 - 7.5 ft • no odor through out
						4			
						5			
						6			
						7			
						8			
						9			
						0			

Gem: 0.0
CH4: 0.0
CO2: 0.0

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BORING LOG

SHEET 1 OF 3

LOCATION OF BORING: North Central	PROJECT NO. 120097
	PROJECT NAME COBI: Vincent Rd Landfill
	BORING NO. Vent #2
SKETCH OF LOCATION	DRILLING METHOD: HSA
	LOGGED BY: Carmen
	DRILLER: Holt (Kevin Bacon) B58
	SAMPLING METHOD: SPT 2" diameter
	HAMMER WEIGHT/SAMPLER DIAMETER 140 lbs
	OBSERVATION WELL INSTALL YES X NO ____ LFG
DATUM	GRADE ELEV.
	SURFACE CONDITION grass - dry

	START	FINISH
WATER LEVEL	N/A	
TIME	1420	1555
DATE	8/16/23	8/16/23
CASING DEPTH		

FIELDSCREENING									
ENV. SAMPLE TIME	PID (ppm)	SHEEN	SAMPLE NO. / SAMPLE TYPE	SAMPLE DEPTH	INCHES DRIVEN / INCHES RECV'D	DEPTH IN FEET	PENETRATION RESISTANCE	USCS SUMMARY	DESCRIPTION: Density, moisture, color, minor, MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. DRILL ACTION
						1			* Cutting of drill rig – Black, organics, glass, ware material. All smaller than 2"
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						10			SILTY SAND
	0.1	55					5		• Black, medium dense, moist
						11	7	SM	• F- Sand 2" or less waste debris. Glass, brick, non plastic
							8		
						12			
						13			
						14			
						15			
						16			
						17			
						18			
						19			
						20			

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BORING LOG

SHEET 2 OF 3

LOCATION OF BORING	PROJECT NO.	BORING NO. Vent #2
	PROJECT NAME	
SKETCH OF LOCATION	DRILLING METHOD:	
	LOGGED BY:	
	DRILLER:	
	SAMPLING METHOD:	
	HAMMER WEIGHT/SAMPLER DIAMETER	
	OBSERVATION WELL INSTALL YES _____ NO _____	START / FINISH
	WATER LEVEL	TIME / TIME
	TIME	
	DATE	DATE / DATE
DATUM	GRADE ELEV.	CASING DEPTH

FIELDSCREENING										
ENV. SAMPLE TIME	PID (ppm)	SHEEN	SAMPLE NO. / SAMPLE TYPE	SAMPLE DEPTH	INCHES DRIVEN / INCHES RECV'D	DEPTH IN FEET	PENETRATION RESISTANCE 2in/ft	USCS SUMMARY	SURFACE CONDITION / DESCRIPTION: Density, moisture, color, minor, MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. DRILL ACTION
	0.0	SS				1	3 4 5	SM	S.A.A -roots @ 21.1 ft
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						30			
						1	8 8 8		No recovery *hit rock. *Cuttings S.A.A
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						40			

3GM
CH_4 : 1.1 %
CO_2 : 0.2 %

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BORING LOG

SHEET 3 OF 3

LOCATION OF BORING	PROJECT NO. 120097	BORING NO. Vent #2
	PROJECT NAME	
SKETCH OF LOCATION	DRILLING METHOD:	
	LOGGED BY:	
	DRILLER:	
	SAMPLING METHOD:	
	HAMMER WEIGHT/SAMPLER DIAMETER	
	OBSERVATION WELL INSTALL YES _____ NO _____	START / FINISH
	WATER LEVEL	TIME / TIME
	TIME	
	DATE	DATE / DATE
DATUM / GRADE ELEV.	CASING DEPTH	

FIELDSCREENING										
ENV. SAMPLE TIME	PID (ppm)	SHEEN	SAMPLE NO. / SAMPLE TYPE	SAMPLE DEPTH	INCHES DRIVEN / INCHES RECV	DEPTH IN FEET	PENETRATION RESISTANCE (40ft)	USCS SUMMARY	SURFACE CONDITION / DESCRIPTION: Density, moisture, color, minor, MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. DRILL ACTION
	0.0	NS			18 / 18	1	25 / 36 / 47	SP	native SAND • moist, gray, very dense • F-M Sand, no odor, rusty staining @ 40.9, 1/2" thick
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						50			
	0.0	NS			11 / 12	1	36 / 50/5"		S.A.A
						2			
						3			• End of boring @ 51.0' • Screen from 47.5-7.5' • no odor through out
						4			
						5			
						6			
						7			
						8			
						9			
						0			

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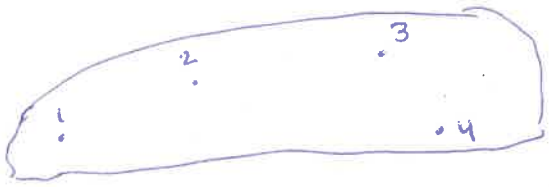
BORING LOG

SHEET 1 OF 3

LOCATION OF BORING: North Corner	PROJECT NO. 120097
	PROJECT NAME LOBI: Vincent Rd. Landfill
	BORING NO. Vent #3
SKETCH OF LOCATION	DRILLING METHOD: HSA
	LOGGED BY: Carmen
	DRILLER: Holt (Kevin Bacon) B58
	SAMPLING METHOD: HST (SPT) 2" diameter
	HAMMER WEIGHT/SAMPLER DIAMETER 140 lbs
	OBSERVATION WELL INSTALL YES X NO ____ LFG
DATUM	GRADE ELEV.



		START	FINISH
WATER LEVEL	NA		
TIME		TIME 0815	TIME 1030
DATE		DATE 8/17/23	DATE 8/17/23
CASING DEPTH			

SURFACE CONDITION: grass

DESCRIPTION: Density, moisture, color, minor, MAJOR CONSTITUENT.
NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. DRILL ACTION

FIELDSCREENING: ENV. SAMPLE TIME	FIELDSCREENING: PID (ppm)	FIELDSCREENING: SHEEN	SAMPLE NO. / SAMPLE TYPE	SAMPLE DEPTH	INCHES DRIVEN / INCHES RECV'D	DEPTH IN FEET	PENETRATION RESISTANCE	USCS SUMMARY
						1		
						2		
						3		
						4		
						5		
						6		
						7		
						8		
						9		
	76.5					10		
10ft	[illegible]	SS			18 / 12		19	SM
	48.5					11	14	
11ft	[illegible]	SS					8	
	[illegible]	SS				2		
						3		
						4		
						5		
						6		
						7		
						8		
						9		
						0		

- Top ~2.5 to 3' SILTY SAND w/ gravel
  - F-M Sand, F-C gravel SubR
  - ↳ From Soil Cuttings.
- Waste material starting ~3-3.5'
  - glass, brick debris, wood fragments all in Soil Cuttings

SILTY SAND
10 - 10.6 ft: brown, moist, medium dense
10.6 - 11 ft: black, moist, medium dense, waste debris
- F-M Sand, trace F SubR gravel,
- no odor

glass, wood pieces, plastic ≤ 2"

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BORING LOG

SHEET 2 OF 3

LOCATION OF BORING	PROJECT NO. 120097	BORING NO. Vent #3
	PROJECT NAME	
SKETCH OF LOCATION: See pg 1.	DRILLING METHOD:	
	LOGGED BY:	
	DRILLER:	
	SAMPLING METHOD:	
	HAMMER WEIGHT/SAMPLER DIAMETER	
	OBSERVATION WELL INSTALL YES ____ NO ____	START / FINISH
	WATER LEVEL	TIME / TIME
	TIME	
	DATE	DATE / DATE
DATUM / GRADE ELEV.	CASING DEPTH	

FIELDSCREENING										
ENV. SAMPLE TIME	PID (ppm)	SHEEN	SAMPLE NO. / SAMPLE TYPE	SAMPLE DEPTH	INCHES DRIVEN / INCHES RECV'D	DEPTH IN FEET	PENETRATION RESISTANCE (with 140# hammer)	USCS SUMMARY	SURFACE CONDITION / DESCRIPTION: Density, moisture, color, minor, MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. DRILL ACTION
	6.1	SS			18 / 11	1	15		S.A.A
							10		20 – 21.4 ft : brown
	4.8	SS					10		• becomes black @ 21.4ft w/ waste debris. Glass + wood
						2			• 21.9 ft – 21.16 ft : Piece of wood debris
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						30			
	2.7	SS			18 / 18		8		S.A.A
						1	11		• All black, moist, Medium dense
							14		• F-M Sand, trace F Sub R gravel
						2			• More glass, brick and wood fragments all ≤ 2"
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						40			

GEM CH4: 0.0 %
CO2: 0.1 %

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BORING LOG

SHEET 3 OF 3

LOCATION OF BORING	PROJECT NO. 120097	BORING NO. Vent #3
	PROJECT NAME .	
SKETCH OF LOCATION	DRILLING METHOD:	
See pg 1.	LOGGED BY:	
	DRILLER:	
	SAMPLING METHOD:	
	HAMMER WEIGHT/SAMPLER DIAMETER	
	OBSERVATION WELL INSTALL YES ____ NO ____	START TIME / FINISH TIME
	WATER LEVEL / TIME / DATE	START DATE / FINISH DATE
DATUM / GRADE ELEV.	CASING DEPTH	

FIELDSCREENING										
ENV. SAMPLE TIME	PID (ppm)	SHEEN	SAMPLE NO. / SAMPLE TYPE	SAMPLE DEPTH	INCHES DRIVEN / INCHES RECV'D	DEPTH IN FEET	PENETRATION RESISTANCE 140A	USCS SUMMARY	SURFACE CONDITION / DESCRIPTION: Density, moisture, color, minor, MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. DRILL ACTION
	80	SS			18 / 17	1	22	SP	Sand native?
							27		moist, gray to blue gray, dense
							26		F-M Sand; trace silt, no odor, free of
						2			wood fragments/waste debris.
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						50			S.A.A
	1.7	SS			18 / 11	1	27		
							50/5"		
						2			• End of boring at 50.9'
						3			• Screen from 47.5 - 7.5
						4			• no odor through out
						5			
						6			
						7			
						8			
						9			
						0			

JEM
CH4: 10.1 %
CO2: 10.2 %

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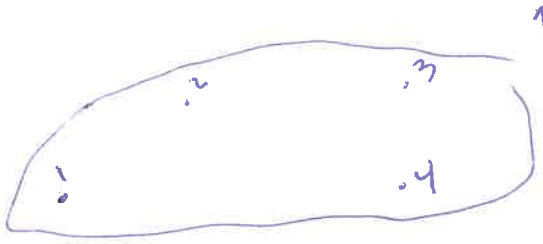
BORING LOG

SHEET 1 OF 3

LOCATION OF BORING	Southern Corner
PROJECT NO.	120097
PROJECT NAME	COBI: Vincent Rd. landfill
BORING NO.	Vent #4
DRILLING METHOD:	HSA
LOGGED BY:	Carmen
DRILLER:	Holt (Kevin Bacon) B58
SAMPLING METHOD:	SPT
HAMMER WEIGHT/SAMPLER DIAMETER	140lbs
OBSERVATION WELL INSTALL	YES X NO LFG
DATUM	
GRADE ELEV.	
SURFACE CONDITION	grass

SKETCH OF LOCATION



		START	FINISH
WATER LEVEL	N/A		
TIME		TIME 1322	TIME 1535
DATE		DATE 8/17/23	DATE 8/17/23
CASING DEPTH			

FIELDSCREENING										
ENV. SAMPLE TIME	PID (ppm)	SHEEN	SAMPLE NO. / SAMPLE TYPE	SAMPLE DEPTH	INCHES DRIVEN / INCHES RECV'D	DEPTH IN FEET	PENETRATION RESISTANCE	USCS SUMMARY	DESCRIPTION: Density, moisture, color, minor, MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. DRILL ACTION
						1			Soil Cuttings SILTY SAND w/ GRAVEL top ~2-4ft ·F-M Sand F-C Sub R gravel C~4ft - Soil Cuttings present waste ·black, pieces of glass + brick.
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						10			
GEM CH4: 0.0% CO2: 0.0%	0.3	SS			18/16	1	4 5 7	SM	SILTY SAND ·F-M Sand, F-Sub R gravel trace ·black, moist, medium dense ·glass, plastic, brick debris < 2"
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						0			

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BORING LOG

SHEET 3 OF 3

LOCATION OF BORING	PROJECT NO. 120097	BORING NO. Vent #4
	PROJECT NAME	
SKETCH OF LOCATION: See pg 1.	DRILLING METHOD:	
	LOGGED BY:	
	DRILLER:	
	SAMPLING METHOD:	
	HAMMER WEIGHT/SAMPLER DIAMETER	
	OBSERVATION WELL INSTALL. YES ____ NO ____	START / FINISH
	WATER LEVEL	TIME / TIME
	TIME	
	DATE	DATE / DATE
DATUM / GRADE ELEV.	CASING DEPTH	

SURFACE CONDITION

DESCRIPTION: Density, moisture, color, minor, MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. DRILL ACTION

FIELDSCREENING: ENV. SAMPLE TIME	PID (ppm)	SHEEN	SAMPLE NO. / SAMPLE TYPE	SAMPLE DEPTH	INCHES DRIVEN / INCHES RECV'D	DEPTH IN FEET	PENETRATION RESISTANCE (blows/6")	USCS SUMMARY	DESCRIPTION
	0.2	SS			18/15	1	4, 3	SM	SILTY SAND • moist, black, loose • F-M Sand, F-Sub R Trace gravel • plastic, glass, and wood debris < 2" • no odor
	0.5	SS				2	4		
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						30			
	0.5	SS			18/18	1	8, 9	SM	S.A.A becomes medium dense
	0.9	SS				2	8		
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						40			

GEM: 0.5%
CH4: 0.2%
CO2: 0.2%

GEM: 0.9%
CH4: 0.1%
CO2: 0.1%

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BORING LOG

SHEET 2 OF 3

LOCATION OF BORING	PROJECT NO. 120097	BORING NO. Vent #4
	PROJECT NAME	
SKETCH OF LOCATION	DRILLING METHOD:	
See pg. 1	LOGGED BY:	
	DRILLER:	
	SAMPLING METHOD:	
	HAMMER WEIGHT/SAMPLER DIAMETER	
	OBSERVATION WELL INSTALL YES ____ NO ____	START TIME / FINISH TIME
	WATER LEVEL / TIME / DATE	START DATE / FINISH DATE
DATUM	GRADE ELEV.	CASING DEPTH

FIELDSCREENING										
ENV. SAMPLE TIME	PID (ppm)	SHEEN	SAMPLE NO. / SAMPLE TYPE	SAMPLE DEPTH	INCHES DRIVEN / INCHES RECV'D	DEPTH IN FEET	PENETRATION RESISTANCE 140 lb	USCS SUMMARY	SURFACE CONDITION / DESCRIPTION: Density, moisture, color, minor, MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. DRILL ACTION
	2.8	SS			18/17	1	5	SM	S.A.A
	2.1	SS					10		becomes medium dense and with
						2	10		less waste material in bottom 3-4"
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						0			
	2.9	SS*			18/12	1	19	SP	SAND
							26		- moist, gray, Very dense
	0.2	NS					30		- Trace Silt. native
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						0			

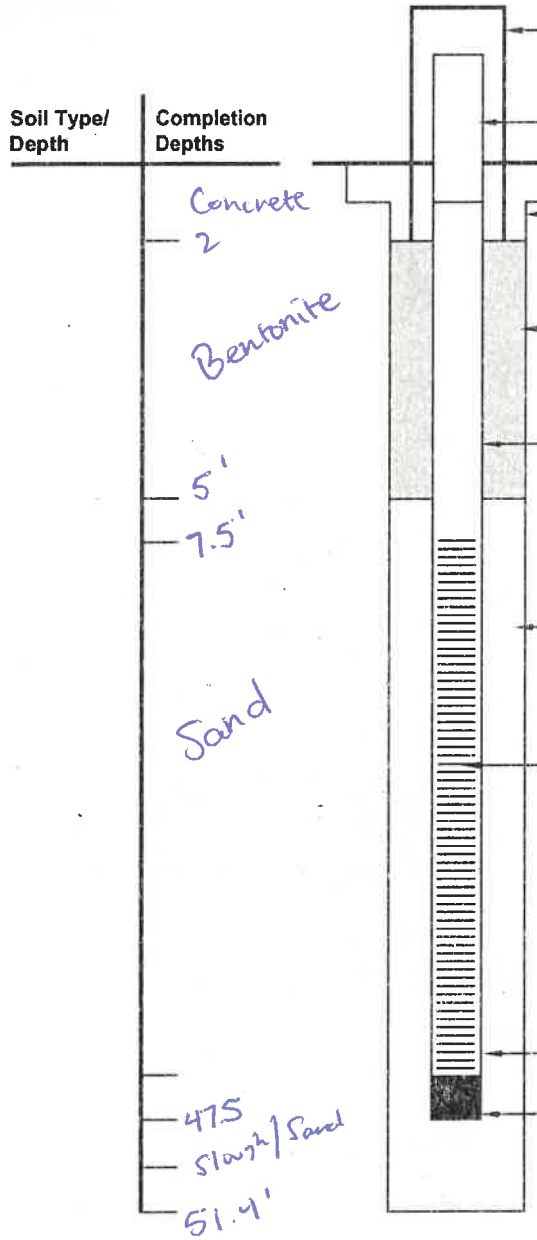
GEM
CH4: 0.9%
CO2: 0.9%

*Heavy sheen
GEM
CH4: 3.2%
CO2: 2.3%

As-Built Well Completion Diagram

Project Number: 120097	Boring/Monitoring Well Number: Vent 1 Sheet: 1 of: 1
Project: COBI Vincent Rd. Landfill	Location: Vincent Rd. Landfill, Bainbridge Island, WA
Elevation: –	Drilling Contractor: Holt Services (Kevin Bawn)
Drilling Method and Equipment Used: HSA, Mobile B58	Logged By: CMT
Water Levels: N/A	Completion Start: 08/16/2023 / 1105 Finish: 08/18/2023 /

Ecology Well ID BPD-034



Monument Type/Height Stick up

Well Cap Type Compression

Surface Seal Material Concrete

Seal Material 3/8 hydrated bentonite chips
(list NSF/ANSI certification) NSF 60

Well Casing ID 2"

Type of Casing Sch 40 PVC

Type of Connection Threaded

Filter Pack/Size #2/20 Silica Sand

Filter Pack Interval 47.5' - 5'

Well Screen ID 2"

Type of Screen Sch 40 PVC

Slot Size 0.050"

Screen Interval 47.5' - 7.5'

Centralizers N/A

Diameter of Borehole ~8.25" (inner ~6")

Sump N/A

Bottom of Boring 51.4' bgs

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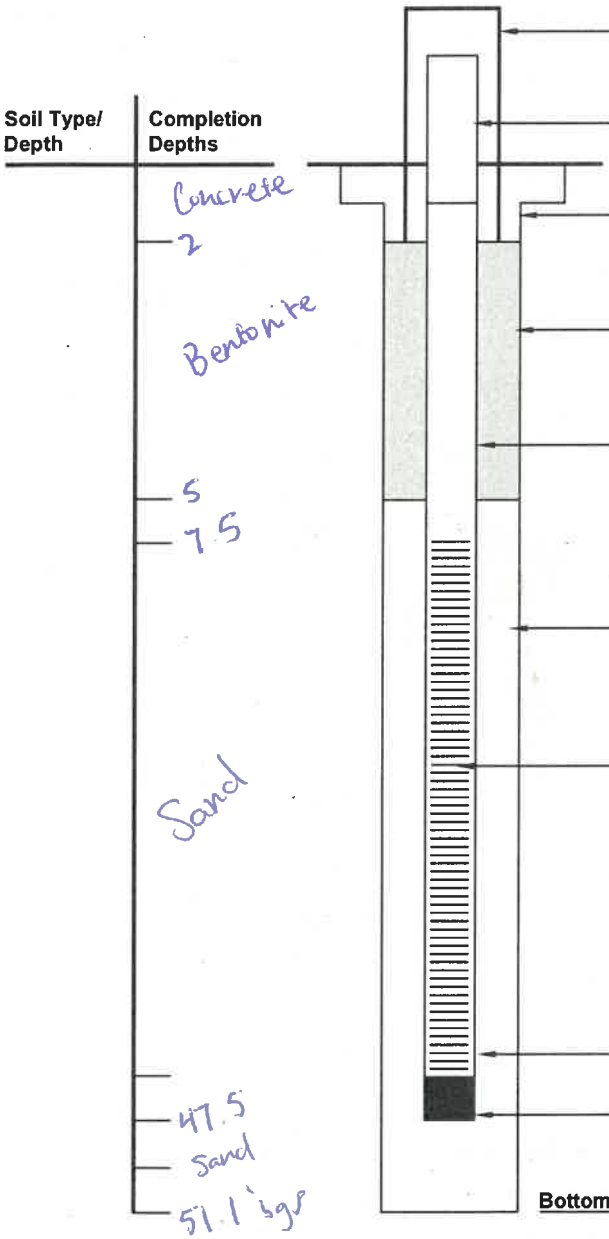
Materials Used:	Screen: 40'
Sand: 33	Bentonite: 2
Blank:	Monument: 1
Concrete:	Other: Stick up Casing (x1) bollards (x3)

Q:_ACAD Standards\Standard Details\Well Diagram.dwg

As-Built Well Completion Diagram

Project Number: 120097	Boring/Monitoring Well Number: Vent #2 Sheet: 1 of: 1
Project: COBI: Vincent Rd landfill	Location: See field maps
Elevation: –	Drilling Contractor: Holt (Kevin Bacon)
Drilling Method and Equipment Used: HSA (SPT)	Logged By: Carmen → Completed on 8/18/23
Water Levels: N/A	Completion Start: 1600 8/16/23 Finish: 8/17/23 (until bentonite patch)

Ecology Well ID BPD-035



Monument Type/Height Stick up

Well Cap Type Compression

Surface Seal Material Concrete

Seal Material 3/8 hydrated Bentonite Chips
(list NSF/ANSI certification) NFS 60

Well Casing ID 2"

Type of Casing Sch 40 PVC

Type of Connection Threaded

Filter Pack/Size #12/20 Silica Sand

Filter Pack Interval 47.5' - 5'

Well Screen ID 2"

Type of Screen Sch. 40 PVC

Slot Size 0.050"

Screen Interval 47.5" - 7.5"

Centralizers N/A

Diameter of Borehole ~~8~~ ~8.25" (inner ~6")

Sump N/A

Bottom of Boring 51.1' bgs

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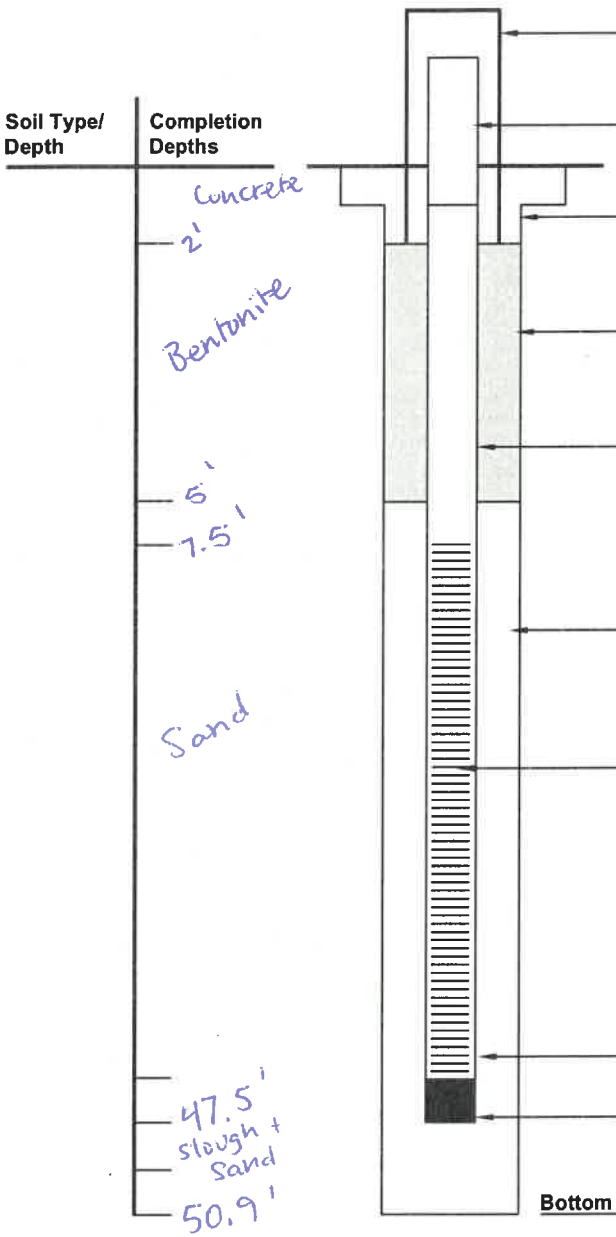
Materials Used:	Screen:
Sand: 34	Bentonite: 2
Blank:	Monument:
Concrete:	Other: Stick up Casing (x1) bollards (x3)

Q:_ACAD Standards\Standard Details\Well Diagram.dwg

As-Built Well Completion Diagram

Project Number: 120097	Boring/Monitoring Well Number: Vent #3 Sheet: 1 of: 1
Project: COBI: Vincent Rd landfill	Location: See field maps
Elevation: —	Drilling Contractor: Holt (Kevin Bacon)
Drilling Method and Equipment Used: HSA (SPT)	Logged By: Carmen 8/18/23 0920 Monument + bollards set
Water Levels: N/A	Completion Start: 1050 8/17/23 Finish: 1232 8/17/23 to bentonite patch.

Ecology Well ID BPD-037



Monument Type/Height Stick up w/ bollards

Well Cap Type Compression

Surface Seal Material Concrete

Seal Material 3/8 hydrated Bentonite chips
(list NSF/ANSI certification) NSF 60

Well Casing ID 2"

Type of Casing Sch 40 PVC

Type of Connection Threaded

Filter Pack/Size #12/20 Silica Sand

Filter Pack Interval 47.5' - 5'

Well Screen ID 2"

Type of Screen Sch 40 PVC

Slot Size 0.050"

Screen Interval 47.5' - 7.5'

Centralizers N/A

Diameter of Borehole ~8.25" (inner ~6")

Sump N/A

Bottom of Boring 50.9' bgs

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Materials Used:	Screen: 40'
Sand: 35 +1	Bentonite: ~1
Blank:	Monument: 1 Stick up
Concrete: 5	Other: Stick up Casing (x1) bollards (x3)

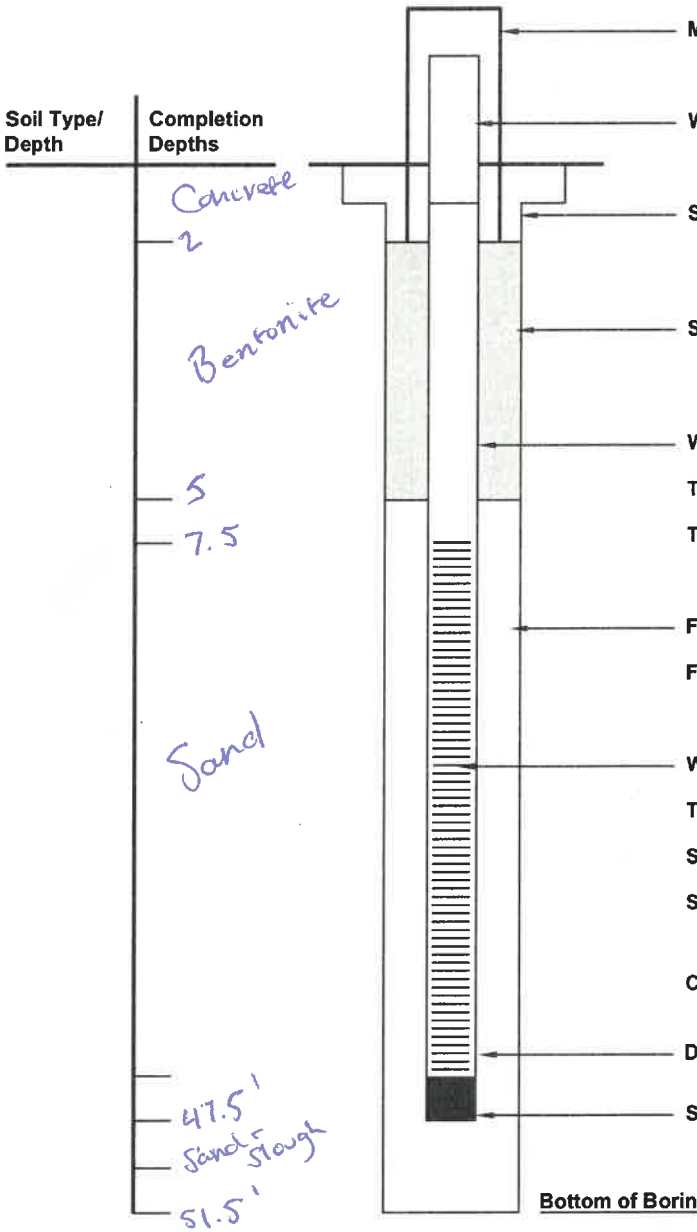
Q:_ACAD Standards\Standard Details\Well Diagram.dwg

As-Built Well Completion Diagram

Project Number: 120097	Boring/Monitoring Well Number: Vent #4 Sheet: 1 of: 1
Project: COBI: Vinent Rd landfill	Location: See field maps
Elevation: -	Drilling Contractor: Holt (Kevin Bacon)
Drilling Method and Equipment Used: HSA (SPT)	Logged By: Carmen ↗ Completed on 8/18/22
Water Levels: N/A	Completion Start: 1535 Finish: 1735

Ecology Well ID BPD-036

8/17/23 ↳ until bentonite seal 8/17/23



Monument Type/Height: Stick up

Well Cap Type: Compression

Surface Seal Material: Concrete

Seal Material: 3/8 hydrated bentonite chips

(list NSF/ANSI certification) NSF60

Well Casing ID: 2"

Type of Casing: Sch 40 PVC

Type of Connection: Threaded

Filter Pack/Size: #12/20 Silica Sand

Filter Pack Interval: 47.5' - ~~5~~ 5'

Well Screen ID: 2"

Type of Screen: Sch. 40 PVC

Slot Size: 0.050"

Screen Interval: 47.5' - 7.5'

Centralizers: N/A

Diameter of Borehole: ~8.25" (inner ~6")

Sump: N/A

Bottom of Boring: 51.5' bgs

Materials Used:	Screen: 40'
Sand: 35	Bentonite: ~~2~~ 2
Blank:	Monument:
Concrete:	Other: Stick up Casing (x4) bollards (x3)

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Q:_ACAD Standards\Standard Details\Well Diagram.dwg

Vincent Road Landfill
Gas Probe Data Sheet

Gas Probe ID: GPV-1

Date & Time: 08/21/23 / 1541 Field Personnel: FCE

Baro. Pressure (in Hg): 29.61 rising / falling / Steady

Casing Volume Purged	Volume Purged (L)	Purge Rate (L/min)	Purge Time		CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (%volume)	H_2S (%volume)
0	0	0	0	sec	0.0	9.5	10.7	2	0
1/4	7.7	5	93	sec	0.2	8.4	7.5	2	0
1/2	15.4	5	185	sec	0.4	8.4	7.4	1	0
3/4	23.2	5	278	sec	0.3	8.4	7.3	2	0
1	30.9	5	371	sec	0.3	8.4	7.3	2	0
1 1/4	38.6	5	463	sec	0.2	8.4	7.3	2	1
1 1/2	46.3	5	556	sec	0.2	8.4	7.2	2	0
1 3/4	54.1	5	649	sec	0.2	8.3	7.2	1	1
2	61.8	5	741	sec	0.2	8.3	7.2	2	0
2 1/4	69.5	5	834	sec	0.2	8.3	7.1	1	1
2 1/2	77.2	5	927	sec	0.2	8.3	7.1	1	1
2 3/4	84.9	5	1,019	sec	0.2	8.3	7.0	2	1
3	92.7	5	1,112	sec	0.2	8.2	7.0	1	1

Comments:

Total Casing Volume (L): 30.9

Probe Diameter (in): 2 confirm (Yes) / No

Top of Screen (ft btoc): 10.0

Depth to Water (ft btoc): Dry Screen submerged? Yes / (No)

Total Depth (ft btoc): 53.66 confirm (Yes) / No

Vincent Road Landfill
Gas Probe Data Sheet

Gas Probe ID: GPV-2

Date & Time: 08/21/23 / 1623 Field Personnel: FCE

Baro. Pressure (in Hg): 29.60 rising / falling (Steady)

Casing Volume Purged	Volume Purged (L)	Purge Rate (L/min)	Purge Time		CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (%volume)	H_2S (%volume)
0	0	0	0	sec	0.8	7.3	9.1	3	0
1/4	7.7	5	93	sec	5.4	4.0	0.0	10	0
1/2	15.4	5	185	sec	5.4	4.0	0.0	11	0
3/4	23.2	5	278	sec	5.5	4.0	0.0	10	0
1	30.9	5	371	sec	5.5	4.0	0.0	10	0
1 1/4	38.6	5	463	sec	5.5	4.0	0.0	10	0
1 1/2	46.3	5	556	sec					
1 3/4	54.1	5	649	sec					
2	61.8	5	741	sec					
2 1/4	69.5	5	834	sec					
2 1/2	77.2	5	927	sec					
2 3/4	84.9	5	1,019	sec					
3	92.7	5	1,112	sec					

Comments: Ended purging after 3 consecutive similar readings.
End time: 1632

Total Casing Volume (L): 30.9

Probe Diameter (in): 2 confirm (Yes) / No

Top of Screen (ft btoc): ~~10.0~~ 12.5'

Depth to Water (ft btoc): Dry Screen submerged? Yes / (No)

Total Depth (ft btoc): 53.66 confirm (Yes) / No

Vincent Road Landfill
Gas Probe Data Sheet

Gas Probe ID: GPV-3

Date & Time: 08/21/23 1731 Field Personnel: JCE

Baro. Pressure (in Hg): 29.60 ~~1731~~ rising / falling (steady)

Casing Volume Purged	Volume Purged (L)	Purge Rate (L/min)	Purge Time		CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (%volume)	H_2S (%volume)
0	0	0	0	sec	0.9	6.6	3.4	6	0
1/4	7.7	5	93	sec	9.2	7.4	0.4	3	0
1/2	15.4	5	185	sec	9.2	7.4	0.3	~~3~~	~~0~~ 0
3/4	23.2	5	278	sec	9.3	7.3	0.3	3	0
1	30.9	5	371	sec	9.3	7.3	0.3	3	0
1 1/4	38.6	5	463	sec	9.3	7.3	0.3	3	0
1 1/2	46.3	5	556	sec					
1 3/4	54.1	5	649	sec					
2	61.8	5	741	sec					
2 1/4	69.5	5	834	sec					
2 1/2	77.2	5	927	sec					
2 3/4	84.9	5	1,019	sec					
3	92.7	5	1,112	sec					

Comments: 3 Consecutive readings. Purging ended at ~~1737~~

Total Casing Volume (L): 30.9

Probe Diameter (in): 2 confirm (Yes) / No

Top of Screen (ft btoc): ~~10.0~~ 12.5'

Depth to Water (ft btoc): Dry Screen submerged? Yes / (No)

Total Depth (ft btoc): 54.16 confirm (Yes) / No

Vincent Road Landfill
Gas Probe Data Sheet

Gas Probe ID: GPV-4

Date & Time: 08/21/23 1458 Field Personnel: FCE

Baro. Pressure (in Hg): 29.60 rising / falling (steady)

Casing Volume Purged	Volume Purged (L)	Purge Rate (L/min)	Purge Time	CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (%volume)	H_2S (%volume)
0	0	0	0 sec	4.5	3.3	7.2	6	0
1/4	7.7	5	93 sec	11.8	6.9	1.0	15	0
1/2	15.4	5	185 sec	11.8	7.1	0.7	14	0
3/4	23.2	5	278 sec	11.7	7.2	0.7	13	0
1	30.9	5	371 sec	11.9	7.2	0.7	13	0
1 1/4	38.6	5	463 sec	11.6	7.2	0.8	12	0
1 1/2	46.3	5	556 sec	11.5	7.1	0.9	13	0
1 3/4	54.1	5	649 sec	11.5	7.1	1.1	13	0
2	61.8	5	741 sec	11.5	7.0	1.3	13	0
2 1/4	69.5	5	834 sec	11.6	7.0	1.5	12	0
2 1/2	77.2	5	927 sec	11.6	7.0	1.6	12	0
2 3/4	84.9	5	1,019 sec	11.7	7.0	1.7	11	0
3	92.7	5	1,112 sec	11.8	6.9	1.8	11	0

Comments: Couldn't get the water level indicator pass 24'

Total Casing Volume (L): 30.9

Probe Diameter (in): 2 confirm Yes / No

Top of Screen (ft btoc): ~~10.0~~ 12.5

Depth to Water (ft btoc): — Screen submerged? Yes / No

Total Depth (ft btoc): — confirm Yes / No

Vincent Road Landfill
Gas Probe Data Sheet

Gas Probe ID: GPV-1

Date & Time: 8/28/23 1328 Field Personnel: CMT

Baro. Pressure (in Hg): 29.84 rising / falling (Stable)

Casing Volume Purged	Volume Purged (L)	Purge Rate (L/min)	Purge Time		CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (%volume)	H_2S (%volume)
0	0	0	0	sec	0.0	0.1	20.5	0	0
1/4	7.7	5	1:33 93	sec	0.0	0.9	19.5	1	0
1/2	15.4	5	3:05 185	sec	0.0	1.2	19.2	0	0
3/4	23.2	5	4:38 278	sec	0.0	1.2	19.2	0	0
1	30.9	5	6:11 371	sec	0.0	1.2	19.2	0	0
1 1/4	38.6	5	7:43 463	sec	0.0	1.2	19.2	0	0
1 1/2	46.3	5	9:16 556	sec					
1 3/4	54.1	5	10:49 649	sec					
2	61.8	5	12:21 741	sec					
2 1/4	69.5	5	13:54 834	sec					
2 1/2	77.2	5	15:27 927	sec					
2 3/4	84.9	5	16:59 1,019	sec					
3	92.7	5	18:32 1,112	sec					

Comments: Ended purge after 3 consecutive similar readings. End @ 1336.

Total Casing Volume (L): 30.9

Probe Diameter (in): 2 confirm (Yes) / No

Top of Screen (ft btoc): 10.0

Depth to Water (ft btoc): Dry Screen submerged? Yes / (No)

Total Depth (ft btoc): 49.82 confirm (Yes) / No

Vincent Road Landfill
Gas Probe Data Sheet

Gas Probe ID: GPV-2

Date & Time: 8/28/23 1352 Field Personnel: CMT

Baro. Pressure (in Hg): 29.84 rising / falling (Steady - falling slightly)

Casing Volume Purged	Volume Purged (L)	Purge Rate (L/min)	Purge Time		CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (%volume)	H_2S (%volume)
0	0	0	0	sec	0.0	0	19.8	0	0
1/4	7.7	5	93	sec	0.0	0.1	20.3	0	0
1/2	15.4	5	185	sec	0.0	0.4	19.7	0	0
3/4	23.2	5	278	sec	0.1	0.4	19.7	0	0
1	30.9	5	371	sec	0.0	0.5	19.5	1	0
1 1/4	38.6	5	463	sec	0.0	0.5	19.5	0	0
1 1/2	46.3	5	556	sec	0.0	0.6	19.5	1	0
1 3/4	54.1	5	649	sec	0.1	0.6	19.5	0	0
2	61.8	5	741	sec	0.1	0.6	19.6	0	0
2 1/4	69.5	5	834	sec	0.1	0.6	19.6	1	0
2 1/2	77.2	5	927	sec	0.1	0.5	19.7	0	0
2 3/4	84.9	5	1,019	sec	0.1	0.5	19.8	1	0
3	92.7	5	1,112	sec	0.1	0.5	19.8	0	0

Comments:

Total Casing Volume (L): 30.9

Probe Diameter (in): 2 confirm (Yes) / No

Top of Screen (ft btoc): 10.0

Depth to Water (ft btoc): Dry Screen submerged? Yes / (No) - Some moisture on WL

Total Depth (ft btoc): 48.93 confirm (Yes) / No

Vincent Road Landfill
Gas Probe Data Sheet

Gas Probe ID: GPV-3

Date & Time: 8/28/23 1421 Field Personnel: CMT

Baro. Pressure (in Hg): 29.84 rising / falling (Steady - falling slightly)

Casing Volume Purged	Volume Purged (L)	Purge Rate (L/min)	Purge Time		CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (%volume)	H_2S (%volume)
0	0	0	0	sec	0.0	0.4	20.2	0	0
1/4	7.7	5	93	sec	0.0	0.0	20.6	0	0
1/2	15.4	5	185	sec	0.0	0.1	20.5	0	0
3/4	23.2	5	278	sec	0.0	0.1	20.5	0	0
1	30.9	5	371	sec	0.0	0.1	20.5	0	0
1 1/4	38.6	5	463	sec	0.0	0.1	20.5	1	0
1 1/2	46.3	5	556	sec	0.0	0.1	20.5	0	0
1 3/4	54.1	5	649	sec	0.0	0.1	20.5	0	0
2	61.8	5	741	sec	0.0	0.1	20.5	0	0
2 1/4	69.5	5	834	sec	0.0	0.1	20.5	0	0
2 1/2	77.2	5	927	sec	0.0	0.1	20.5	0	0
2 3/4	84.9	5	1,019	sec	0.0	0.1	20.6	0	0
3	92.7	5	1,112	sec	0.0	0.1	20.6	0	0

Comments:

Total Casing Volume (L): 30.9

Probe Diameter (in): 2 , confirm (Yes) / No

Top of Screen (ft btoc): 10.0

Depth to Water (ft btoc): Dry Screen submerged? Yes / (No) - Slightly moist wtl @ bottom

Total Depth (ft btoc): 49.51 confirm (Yes) / No

Vincent Road Landfill
Gas Probe Data Sheet

Gas Probe ID: GPV-4

Date & Time: 8/28/23 1533 Field Personnel: CMT

Baro. Pressure (in Hg): 29.84 rising / falling Steady - Slightly falling

Casing Volume Purged	Volume Purged (L)	Purge Rate (L/min)	Purge Time	CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (%volume)	H_2S (%volume)
0	0	0	0 sec	0.1	0.0	20.1	0	0
1/4	7.7	5	93 sec	0.9	0.3	20.3	1	0
1/2	15.4	5	185 sec	1.2	0.4	20.0	2	0
3/4	23.2	5	278 sec	1.7	0.5	19.7	2	0
1	30.9	5	371 sec	2.0	0.6	19.4	1	0
1 1/4	38.6	5	463 sec	2.6	0.6	19.1	2	0
1 1/2	46.3	5	556 sec	3.0	0.6	19.0	2	0
1 3/4	54.1	5	649 sec	3.1	0.6	19.0	3	0
2	61.8	5	741 sec	2.7	0.6	19.2	3	0
2 1/4	69.5	5	834 sec	2.4	0.6	19.3	3	0
2 1/2	77.2	5	927 sec	2.2	0.6	19.4	3	0
2 3/4	84.9	5	1,019 sec	2.1	0.5	19.4	3	0
3	92.7	5	1,112 sec	2.0	0.5	19.5	4	0

Comments:

Total Casing Volume (L): 30.9

Probe Diameter (in): 2 confirm (Yes) / No

Top of Screen (ft btoc): 10.0

Depth to Water (ft btoc): * Screen submerged? Yes / No

Total Depth (ft btoc): * confirm Yes / No

*blockage ~116.7ft bgs.
-Seems to be bentonite + Sand

Vincent Road Landfill
Gas Probe Data Sheet

Gas Probe ID: GPV-1

Date & Time: 9/6/23 1317 Field Personnel: CMT

Baro. Pressure (in Hg): 29.72 rising / (falling)

Casing Volume Purged	Volume Purged (L)	Purge Rate (L/min)	Purge Time		CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (%volume)	H_2S (%volume)
0	0	0	0	sec	0.0	0.2	19.2	0	0
1/4	7.7	5	93	sec	0.0	1.9	13.1	0	1
1/2	15.4	5	185	sec	0.0	1.9	12.9	0	1
3/4	23.2	5	278	sec	0.0	2.0	12.7	0	1
1	30.9	5	371	sec	0.0	1.9	12.9	0	1
1 1/4	38.6	5	463	sec	0.0	1.8	13.1	0	1
1 1/2	46.3	5	556	sec	0.0	1.8	13.1	0	1
1 3/4	54.1	5	649	sec	0.0	1.8	13.2	0	1
2	61.8	5	741	sec	0.0	1.8	13.3	0	1
2 1/4	69.5	5	834	sec	0.0	1.8	13.4	0	1
2 1/2	77.2	5	927	sec	0.0	1.7	13.4	0	1
2 3/4	84.9	5	1,019	sec	0.0	1.7	13.5	0	1
3	92.7	5	1,112	sec	0.0	1.7	13.6	0	1

Comments:

Total Casing Volume (L): 30.9

Probe Diameter (in): 2 confirm (Yes) / No

Top of Screen (ft btoc): 10.0

Depth to Water (ft btoc): Dry Screen submerged? Yes / (No)

Total Depth (ft btoc): 48.91 confirm (Yes) / No

Vincent Road Landfill
Gas Probe Data Sheet

Gas Probe ID: GPV-2

Date & Time: 9/6/23 1345

Field Personnel: CMT

Baro. Pressure (in Hg): 29.73 rising / (falling)

Casing Volume Purged	Volume Purged (L)	Purge Rate (L/min)	Purge Time		CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (%volume)	H_2S (%volume)
0	0	0	0	sec	0.0	0.0	19.6	0	0
1/4	7.7	5	93	sec	0.2	1.2	9.6	1	1
1/2	15.4	5	185	sec	0.1	1.2	9.4	1	1
3/4	23.2	5	278	sec	0.1	1.3	9.2	1	1
1	30.9	5	371	sec	0.1	1.3	9.1	1	1
1 1/4	38.6	5	463	sec	0.1	1.3	9.1	1	1
1 1/2	46.3	5	556	sec	0.1	1.3	9.1	1	1
1 3/4	54.1	5	649	sec	0.1	1.2	9.1	1	1
2	61.8	5	741	sec	0.1	1.2	9.1	2	1
2 1/4	69.5	5	834	sec	0.1	1.2	9.1	1	1
2 1/2	77.2	5	927	sec	0.1	1.2	9.1	1	1
2 3/4	84.9	5	1,019	sec	0.1	1.2	9.1	2	1
3	92.7	5	1,112	sec	0.1	1.2	9.1	1	0

Comments:

Total Casing Volume (L): 30.9

Probe Diameter (in): 2 confirm (Yes) / No

Top of Screen (ft btoc): 10.0

Depth to Water (ft btoc): Dry Screen submerged? Yes / (No)

Total Depth (ft btoc): 48.78 confirm (Yes) / No

Vincent Road Landfill
Gas Probe Data Sheet

Gas Probe ID: GPV-3

Date & Time: 9/6/23 1415 Field Personnel: CMT

Baro. Pressure (in Hg): 29.71 rising / (falling)

Casing Volume Purged	Volume Purged (L)	Purge Rate (L/min)	Purge Time		CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (%volume)	H_2S (%volume)
0	0	0	0	sec	0.0	0.0	19.5	0	0
1/4	7.7	5	93	sec	3.5	1.5	8.8	8	0
1/2	15.4	5	185	sec	3.4	1.5	8.8	8	0
3/4	23.2	5	278	sec	3.5	1.5	8.8	8	0
1	30.9	5	371	sec	3.4	1.4	8.8	8	0
1 1/4	38.6	5	463	sec	3.4	1.4	8.8	8	0
1 1/2	46.3	5	556	sec	3.4	1.4	8.8	8	0
1 3/4	54.1	5	649	sec	3.4	1.4	8.8	7	0
2	61.8	5	741	sec	3.4	1.4	8.8	9	0
2 1/4	69.5	5	834	sec	3.5	1.4	8.8	8	0
2 1/2	77.2	5	927	sec	3.5	1.4	8.8	8	0
2 3/4	84.9	5	1,019	sec	3.5	1.4	8.8	8	0
3	92.7	5	1,112	sec	3.4	1.4	8.8	8	0

Comments:

Total Casing Volume (L): 30.9

Probe Diameter (in): 2 confirm (Yes) / No

Top of Screen (ft btoc): 10.0

Depth to Water (ft btoc): Dry Screen submerged? Yes / (No)

Total Depth (ft btoc): 49.31 confirm (Yes) / No

Vincent Road Landfill
Gas Probe Data Sheet

Gas Probe ID: GPV-4

Date & Time: 9/6/23 1445

Field Personnel: CMT

Baro. Pressure (in Hg): 29.70 rising / falling

Casing Volume Purged	Volume Purged (L)	Purge Rate (L/min)	Purge Time	CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (%volume)	H_2S (%volume)
0	0	0	0 sec	0.0	0.0	19.8	0	0
1/4	7.7	5	93 sec	6.7	5.3	2.2	12	0
1/2	15.4	5	185 sec	6.6	5.1	3.0	12	0
3/4	23.2	5	278 sec	6.4	4.8	3.6	11	0
1	30.9	5	371 sec	6.4	4.8	3.7	11	0
1 1/4	38.6	5	463 sec	6.2	4.8	3.9	11	0
1 1/2	46.3	5	556 sec	6.4	4.8	3.9	11	0
1 3/4	54.1	5	649 sec	6.4	4.8	3.9	12	0
2	61.8	5	741 sec	6.5	4.8	3.9	12	0
2 1/4	69.5	5	834 sec	6.4	4.7	4.0	11	0
2 1/2	77.2	5	927 sec	6.5	4.7	4.1	11	0
2 3/4	84.9	5	1,019 sec	6.5	4.7	4.2	11	0
3	92.7	5	1,112 sec	6.4	4.7	4.1	11	0

Comments: * blockage @ 16.72'. Bentonite (hydrated) and filter pack Sand.

Total Casing Volume (L): 30.9

Probe Diameter (in): 2 confirm (Yes) / No

Top of Screen (ft btoc): 10.0

Depth to Water (ft btoc): — Screen submerged? Yes / No

Total Depth (ft btoc): * 16.72 confirm (Yes) / No