Dyment's Creek Historic Waste Sites

2024 Annual Monitoring Report

Submitted to:

City of Barrie, Environmental Risk Management and Compliance

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Distribution List

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Executive Summary

WSP Canada Inc. (WSP) was retained by the City of Barrie (City), to carry out the 2024 Annual Monitoring Program for seven Historic Waste Sites located within the City of Barrie along Bunker's and Dyment's Creeks, located between Anne Street and Bradford Street, approximately 300 to 400 metres (m) west of Kempenfelt Bay. This report describes the results of monitoring conducted between February 22 and September 24, 2024 for the three waste disposal sites referred to as Sites 4, 5 and 6 located along Dyment's Creek (see **Figures 1 and 2**). Sites 1, 2, 3, and 7 (Bunker's Creek) are discussed in a separate report. This work program is intended to constitute an assessment relative to the impacts associated with the landfills, and any potential changes from previous years. This program also fulfils the requirement to report on the operation and monitoring of the landfill gas controls installed at Site 6, monitored under Environmental Compliance Approval (ECA) No. 3118-BD5KTE, dated June 14, 2019, amended June 7, 2023.

The waste sites are largely continuous on both sides of Dyment's Creek and are herein referred to as the "Dyment's Creek Landfills". The sites are bounded by Anne Street to the west, Bradford Street to the east, John Street to the north, and Brock Street to the south. Available information including historic air photo analysis and written records indicates that the waste extends north of the creek in the area of Site 4. Waste is reported to extend onto private properties in the area of Sites 4 and 6.

Parameters associated with impacts to water quality from municipal solid waste typically include elevated concentrations of chloride, sodium, metals including iron, manganese and phosphorous, nitrogen compounds including ammonia and low concentrations of chlorinated volatile organic compounds (VOC) from products co-disposed in the waste. The City implements a program to monitor the environmental conditions relative to surface water quality in Bunker's and Dyment's Creek and relative to the potential for explosive levels of soil-gas (i.e., the methane in landfill gas, LFG). The Provincial Water Quality Objectives (PWQO) are used to assess surface water compliance. Standards for LFG are based on the Lower Explosive Limit (LEL) of methane in air (i.e., 5%); a concentration of 1% methane is used as an action level for monitors located outside of the waste limits.

A sheetpile cut-off wall and passive LFG venting system was constructed at Site 6 in 2020 to prevent LFG from migrating from City-owned lands. The operation of the venting system is regulated under ECA No. 3118-BD5KTE, as amended. Monitoring of the vents and wells beyond the cut-off wall is undertaken to confirm the system is operating as expected. There were no complaints received by the City relating to the operation of this system in 2024.

The following scope of work was implemented for the 2024 monitoring program.

- Surface water quality samples were collected at the five established surface water monitoring locations (SWD1 through SWD5) on September 13, 2024;
- Analysis of the surface water samples for major ions and indicators, metals, polycyclic aromatic hydrocarbons (PAH), VOC and petroleum hydrocarbon fractions F1 to F4 (PHC F1 to F4);
- Measurement of water levels and landfill gas monitoring in February/March 2024 (frozen ground) and September 2024 at select locations; and,
- The gas venting poles (GVP) were monitored in March and September 2024 under the revised ECA.

The primary findings based on the 2024 monitoring program results are as follow:

- Surface water is the ultimate receptor for potential groundwater impacts from the Dyment's Creek historic waste sites. Based on the water quality results from 2024 it is concluded that the waste fill is not notably affecting the surface water quality of Dyment's Creek. Sampling of the creek annually in the early fall (i.e., September) is considered to be sufficient;
- Polycyclic aromatic hydrocarbons (PAH) were not detected at any surface water locations in 2024, consistent with 2022 and 2023 results. Whereas occasional detections of PAH have been inconsistently observed, the data indicates stable trends; and,
- Methane concentrations in wells surrounding Site 4, Site 5 and outside the passive barrier system installed at Site 6 were less than 1% (by volume). The results of the available data are similar to historical observations. Based on the concentration of methane in the gas probes outside of the cut-off wall at Site 6 it is concluded that the LFG control measures at Site 6 are effective at controlling off-site migration of LFG from waste on the City-owned property to the adjacent residential areas.

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1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by the City of Barrie (City), to carry out the 2024 Annual Monitoring Program for seven Historical Waste Sites located within the City of Barrie along Bunker's and Dyment's Creeks, located between Anne Street and Bradford Street, approximately 300 to 400 metres (m) west of Kempenfelt Bay. This report describes the results of monitoring conducted between February 22 and September 24, 2024 for the three waste disposal sites referred to as Sites 4, 5 and 6 located along Dyment's Creek (see **Figures 1 and 2**). Sites 1, 2, 3, and 7 (Bunker's Creek) are discussed in a separate report. This work program is intended to constitute an assessment relative to the impacts associated with the landfills on the quality of Dyment's Creek and adjacent soil gas concentrations, and any potential changes from previous years. This program also fulfills the requirement to report on the operation and monitoring of the landfill gas controls installed at Site 6, monitored under Environmental Compliance Approval (ECA) No. 3118-BD5KTE, dated June 14, 2019, amended June 7, 2023.

Between 2011 and 2013, Golder Associates Ltd. (Golder) conducted an assessment of nine Historical Waste Sites within the City, following the requirements of the Ministry of the Environment, Conservation and Parks (Ministry, MECP or precursors) D-4 Studies and of the Environmental Site Assessment process. The nine sites were part of an identified list of waste sites in Ontario, developed by the Ministry on the basis of information largely collected in a 1979 study (Ministry of the Environment, 1979), supplemented with information available up to 1994 when the Ministry finalized the Waste Inventory. The locations of these closed waste sites were identified based on generalized street descriptions and were reported to be operated from 1956 to 1964, pre-dating the Ministry's Environmental Protection Act (1973). As these sites were largely "unorganized" (i.e., none of them were approved under a Ministry process) their exact locations and character were not known.

Following the initial studies, a total of seven waste sites were identified, four located along Bunker's Creek and three located along Dyment's Creek. These sites are located on lands currently used as parkland, residential, commercial, and industrial land use.

The areas of waste fill have been identified and impact on the environment assessed on the basis of groundwater, surface water and soil gas standards. Whereas the sites largely contain inert fill, waste fill was identified at most of the landfills; key indicators of the impact of the waste fill were identified. Impacts to water quality from municipal solid waste typically include elevated concentrations of chloride, sodium, metals including iron, manganese and phosphorous, nitrogen compounds including ammonia and low concentrations of chlorinated volatile organic compounds (VOC) from products co-disposed in the waste. The Provincial Water Quality Objectives (PWQO) are used to assess surface water compliance.

Standards for methane in LFG are based on the Lower Explosive Limit (LEL) of methane in air (i.e., 5%) and the MECP guidance document "*D-4-1 Assessing Methane Hazards from Landfill Sites*" (July 2021).

2 BACKGROUND

2.1 Historic Waste Site Investigations

Three of the nine waste disposal sites identified in the Ministry Waste Disposal Site Inventory within the City of Barrie are included in the Dyment's Creek area:

- Site 4 - Sanford Street and Brock Street: Located on the east side of Sanford Street, north of Brock Street – closed in 1961 – Ministry Site No. X 4104;
- Site 5 - Innisfil Street and Brock Street: Located between Innisfil Street and Sanford Street, north of Brock Street (known as Brock Park) – closed in 1962 – Ministry Site No. X 4105; and
- Site 6 - John Street and Innisfil Street: Located southwest of the intersection of Innisfil Street and John Street – closed in 1963 – Ministry Site No. X 4106.

The findings of the earlier investigations estimated the approximate areal extent of waste fill as illustrated on **Figure 2**. It is noted that the delineation of waste fill extent was limited to investigation of the portions of sites accessible to the City (i.e., City owned lands). Access to the southern portion of Site 6, including south of 15 Frederick Street located on the south side of Frederick Street nearest the dead-end, was limited due to forest cover. Access to Site 4 was limited to the publicly owned adjacent road allowances.

The waste fill sites are largely continuous on both sides of Dyment's Creek (and herein referred to as the "Dyment's Creek Landfills"), and are bounded by Anne Street to the west, Bradford Street to the east, John Street to the north, and Brock Street to the south. In the area of Site 4, the available information indicates that the waste extends north of the creek and onto the private properties and south to the middle of the property occupied by an apartment building (111 Sanford Street). The waste at Site 6 reportedly extends to the western limit of 113 John Street, but not as far as the building foundation and it is reported that waste may extend onto the southern portions of some properties in the area including 15 Frederick Street.

The material within the Dyment's Creek Landfills consists of coarse soil fill overlying thin layers of waste material. The identified waste consisted primarily of solid materials (e.g., glass, plastic, bricks and metal) considered to be relatively inert however, putrescible materials including animal hides were encountered in boreholes MW-D3, E2-6 (a previously drilled borehole located west of GP-D12), and GP-D5 in Sites 5 and 6. These waste materials were odorous and also contained black organic material. Industrial fabric was encountered at one location (borehole E2-6, west of GP-D12). The overall thickness of the waste ranges from 0.05 metres (m) at several locations to a maximum of 4.37 m. The maximum depth of waste extends to 7.87 m below ground surface (bgs), on the north side of Dyment's Creek, in the southwest portion of Site 6. With the exception of the area near borehole GP-D13 (Site 6), there is a minimum of 1.0 m of cover fill above the top of the waste and direct human contact with the identified waste material is not considered likely. Waste is located directly below the topsoil at GP-D13 and direct human contact with the waste in these areas of thinner cover is possible.

Landfill gas is generated by the decay of organic material typically contained in municipal waste and consists largely of methane and carbon dioxide. Landfill gas (as defined by the presence of elevated methane concentrations) is not present outside of Site 5, nor in the monitored areas surrounding Site 4, within the City-owned rights-of-way. This is based on the absence of, or trace concentrations (up to 0.3%) of, methane at locations GP-D15, GP-D16, GP-D17, GPD19, GP-D7, former GP-D25 (subsequently abandoned) and former GP-D28 (abandoned). Additional investigations within the private properties on Site 4 would be required to confirm the presence and extent of LFG on Site 4; Methane monitoring at a well (labelled MW-A) installed for a D-4 study at 168

Bradford Street, immediately northeast of Site 4 indicated no LFG was present in 2018. No monitoring information has been provided for this well since that time. Site 6 Investigations and Remedial Measures

The historical investigations of the Site 6 area, and subsequent monitoring, indicated that there is no detectable methane north of Site 6 in the John Street, Frederick Street and Robert Street Right of Way (outside of waste limits), at locations GP-D20 and GP-D23R (GP-D22 and GP-D24 were decommissioned in 2023, as acknowledged by the MECP, and had no historically detected methane concentrations). Elevated concentrations of methane are regularly detected in the waste fill within Site 6, specifically at GP-D3 and GP-D13. As these wells are located within waste, it is expected that they will continue to exhibit elevated methane concentrations and are monitored as part of this program due to their inclusion in the Environmental Compliance Approval for Air (ECA Air), described below. For other gas probes located within waste, it was previously recommended that monitoring was no longer required for the purposes of this program.

The extent of LFG migration, relative to some private residences in the area of Frederick Street, is not known as waste is interpreted to extend onto these private properties. The potential presence of methane was communicated by the City to the residents in the area, indicating for them to conduct their own studies if any concerns were identified. A summary of correspondence and reports related to 113 John Street, 15 Frederick Street, and 111 Sanford Street is provided in the report entitled, “D4 Study and Environmental Assessment, Dyment’s Creek Landfills, City of Barrie”[1]. In order to address the risk that methane/LFG from waste on City lands may migrate off-site, the City constructed a passive venting system between October 2019 and June 2020 along the northern and northeastern perimeter of the City-owned Site 6 property. Design and construction of the Barrier and Passive Venting System was approved through ECA Air No. 3118-BD5KTE, dated June 14, 2019 and amended on June 7, 2023 (**Appendix E**).

The passive venting system consists of a 202 m long steel sheet-pile cut-off wall at the limits of City owned lands at the north and east sides of Site 6 (see **Figure 2**). The sheet pile depths range from 1 m to 2.8 m bgs, just below the estimated deepest level of the water table. A shallow (approximately 1.2 m deep) sand-filled vent trench is located 2 m inside (landfill side) of the cut-off wall; a 150-millimetre (mm) diameter vent pipe is located within the trench, connected to a series of vertical gas venting poles (GVP1 to GVP3), which passively release LFG within the trench. The vent poles consist of a 6 m high hollow and tapered galvanized steel pole fitted with a 100 mm diameter wind turbine at the top founded on a concrete pier. The design for this system is outlined in the Passive Landfill Gas Barrier / Venting System Report (Golder 2020).

[1] Golder Associates Ltd., 2013. D4 Study and Environmental Assessment, Dyment’s Creek Landfills, City of Barrie. Report prepared for the City of Barrie dated April 2013.

3 SCOPE AND FIELD INVESTIGATION METHODS

3.1 Monitoring Program

The City implements a monitoring program to monitor surface water quality in Dyment's Creek and the potential for explosive concentrations of methane in the soil-gas. The 2024 monitoring program locations are listed below. Surface water samples are collected annually, in the fall. Based on the presence of trichloroethylene (TCE) at SWD2 in September 2020, additional surface water sampling events were completed in 2021 to 2023.

Landfill gas monitoring is completed semi-annually including once under frozen ground conditions. Monitoring of LFG at wells located within the waste fill is not required unless pertinent to the assessment of specific property use.

The program was modified in 2020 to incorporate additional voluntary sampling of soil-gas monitors; the gas venting pole (GVP) sampling was added to address Condition 2.2 of ECA No. 3118-BD5KTE. Over the last three years, monitoring of the landfill gas passive venting system has shown that the measured levels of all contaminants have been consistently low and that the modelled concentrations of all the measured contaminants have also been consistently less than 1% of their respective O.Reg. 419/05 air quality limits at the point of impingement (POI) locations. This indicates that the system is operating in compliance with the requirements under O.Reg. 419/05 and the ECA. A request to reduce the sampling frequency was approved by the MECP on June 7, 2023 and implemented in 2023.

This report reflects the reduced sampling requirements.

Table 1: 2024 Sampling Locations

Perimeter Landfill Gas Probes (Outside of the Waste Fill)
GP-D7, GP-D15, GP-D16, GP-D17, GP-D19, GP-D20, GP-D21, GP-D23R, GP-D26, and GP-D27
Landfill Gas Probes in Waste
GP-D1, GP-D2, GP-D3, GP-D8, GP-D13, and GP-D14
Gas Venting Poles (GVP)
GVP1, GVP2 and GVP3
Surface Water Sampling Locations
SWD1, SWD2, SWD3, SWD4, SWD5

Note: Shaded wells included to assess performance of the LFG controls at Site 6, as per ECA No. 3118-BD5KTE, as amended. Gas probes GP-D22 and GP-D24 were decommissioned and removed from the monitoring program as part of the June 2023 ECA Air amendment. Gas probe GP-D23 was also decommissioned; however, this well was replaced by GP-D23R and remains included in the monitoring program.

The following scope of work was implemented for the 2024 monitoring program.

- Surface water quality samples were collected at the five established surface water monitoring locations on September 13, 2024;

- Analysis of the surface water samples for major ions and indicators, metals, polycyclic aromatic hydrocarbons (PAH), VOC and petroleum hydrocarbon fractions F1 to F4 (PHC F1 to F4);
- Measurement of water levels and landfill gas monitoring in February/March 2024 (frozen ground) and September 2024 at select locations; and,
- The GVP were monitored under the revised ECA Air in March and September 2024.

3.2 Surface Water Sampling

Five surface water samples (SWD1 through SWD5) along Dyment's Creek were collected on September 13, 2024 (see **Figure 2** for sampling locations). No evidence of leachate seeps, including sheen or discolouration of the water, was observed within the areas next to the sampling locations, except:

- A green colouration was noted at SWD3 (upstream sample). The City accompanied WSP during the surface water sampling program and notified the City's dispatch of a possible spill at the time of sampling (see photo below). The discolouration of the stream water is not inferred to be related to discharge from the landfills.

Photograph 1: Surface Water Sampling Location SWD3

In addition to the sample locations, WSP visually assessed the conditions along the entire portion of the creek from the bank during each sampling event and no visible leachate seeps (e.g., sheen or discolouration) were noted.

Samples were collected from downstream (SWD1) to upstream (SWD3) locations to prevent cross-contamination. To prevent spillage of preservatives and ensure collection of a representative sample, a clean, dry amber glass jar was used to collect each sample from the middle of the water column and was subsequently poured into laboratory supplied sampling containers. At the time of sampling, the surface water samples were placed in coolers with ice and subsequently submitted to the commercial analytical laboratory under chain-of-custody procedures. Each surface water sample was submitted for laboratory analysis of PHC F1 – F4, PAH, VOC, metals, major ions and indicators. **Table 2** below provides a summary of the measured field parameters for the surface water samples submitted for laboratory analysis.

Table 2: Summary of Analyzed Field Parameters – Dyment's Creek Landfills – September 13, 2024

Sample I.D.	Location Relative to Closed Landfills	Field pH	Field Temp. (ºC)	Field Cond. (µS/cm)	ORP (mV)	Flow
SWD1	Downstream	7.7	17.0	1202	209	Moderate
SWD2	Between Sites 5 and 6	7.7	18.0	1151	150	Slow
SWD3	Upstream	7.7	18.3	1098	192	Slow
SWD4	Site 5	7.7	17.7	1188	196	Slow
SWD5	Site 6	7.3	18.1	1143	171	Slow

Notes:
µS/cm = micro Siemens per centimetre
ORP = Oxidation-reduction potential
mV = Millivolts

3.3 Analytical Program

WSP retained the services of SGS Canada Inc., (SGS) of Lakefield, Ontario. SGS is accredited by Canadian Association for Laboratory Accreditation Inc. (CALA program). Analytical methods are reported by the laboratories on the Laboratory Certificates of Analysis provided in **Appendix C**.

3.4 Quality Assurance/Quality Control

Relative Percent Difference (RPD) is calculated where results for both the original and duplicate samples are at concentrations of greater than five times the laboratory reportable detection limits (RDL). Field duplicate surface water samples with calculated RPD values greater than 50% are considered questionable.

The standard analytical methods and procedures used, as well as internal laboratory method blanks, duplicates and surrogate recoveries for organic analyses are also provided on the laboratory Certificates of Analysis provided in **Appendix C**.

The laboratory maintains in-house quality assurance/quality control (QA/QC) programs to govern sample analysis. Standard QA/QC protocols include the analysis of method blanks, matrix spikes and 10% replicates for each sample batch. In addition to the quality control employed by the laboratories, the following QA/QC samples were also submitted during the work program:

- One surface water field duplicate sample (DUP2, a duplicate of SWD5) was submitted for analysis of analyzed parameters during the work program;
- One blind field blank sample was submitted for analysis of analyzed parameters; and,
- One trip blank sample was submitted for analysis of VOC and PHC F1 only.

3.5 Landfill Gas Sampling

A portable, high-volume pump (10 L/min) was used to purge three times the volume of each gas probe prior to sampling; the wells were outfitted with a valve and cap to prevent atmospheric influence. Readings including the

relative concentrations of carbon dioxide (CO_2), methane (CH_4), and oxygen (O_2) were obtained from the gas probes using a calibrated GEM 2000 or GEM 5000 landfill gas monitor.

Table 6 provides a summary of LFG readings in the gas probes. **Figure 5** provides a summary of methane gas concentrations in plan view. Concentrations of methane are typically higher under frozen ground conditions (i.e., in winter).

Methane has not previously been detected in wells constructed outside the waste (i.e., to the immediate west or east of Site 4 and wells constructed at greater distances to the north and south in the John and Brock Street rights-of-way) but is consistently present in wells within the waste. The 2024 monitoring program at these sites was limited to the gas probes located outside the waste to assess migration toward adjacent properties, with the exceptions of those sampled as part of the ECA Air sampling requirements in Site 6.

3.6 Standards for LFG

Standards for methane in LFG are based on the Lower Explosive Limit (LEL) of methane in air (i.e., 5%). The MECP guidance document "*D-4-1 Assessing Methane Hazards from Landfill Sites*" (July 2021) indicates that where studies are available that demonstrate that methane is not present in the landfilled waste at a concentration greater than 20% LEL (i.e., 1% methane in air), it can be assumed that methane from that landfill is not present on adjacent properties at a higher concentration. Accordingly, an action level of 1% methane at wells outside of the waste is used to identify areas requiring further assessment.

4 GROUNDWATER AND SURFACE WATER RESULTS

4.1 Groundwater Elevations and Flow

A summary of groundwater elevations obtained from the monitoring wells and gas probes is provided in **Table B-1** (**Appendix B**). Groundwater elevations ranged from 220.22 m above sea level (asl) (at GP-D7) to 223.84 m asl (at GP-D20) in February 2024 and from 220.11 m asl (at GP-D7) to 223.72 m asl (at GP-D20) in September 2024, which are relatively consistent with the data from previous years. In general, and as expected, water levels were lower during the Fall event than in the Spring event. At some locations, the water table was below the screened interval (i.e., the well was dry).

Figure 3 illustrates the groundwater flow direction based on water levels obtained in February 2024. Groundwater flow directions are consistent with those in the Fall sampling event. Groundwater flow is interpreted to be easterly overall, but flows locally to the topographic low formed by Dyment's Creek. At Site 4, shallow groundwater flow is interpreted to be toward Dyment's Creek however, there are a limited number of monitoring locations in this area and a component of groundwater may flow north-easterly and potentially east to adjacent properties before discharging to Dyment's Creek northeast of monitoring well MWD7. At Sites 5 and 6, shallow groundwater is interpreted to be toward Dyment's Creek. Groundwater originating from within the waste fill areas would not likely impact adjacent properties outside the estimated waste limits, as groundwater is interpreted to flow away from these properties.

4.2 Analytical Results

Laboratory Certificates of Analysis for surface water are provided in **Appendix C**. The analytical results for surface water samples were compared to the respective PWQO for surface water and are summarized in **Tables 7 through 9,** following the text of the report.

Surface water sampling locations for which the analytical results exceed the various standards used for comparison are provided on **Figure 4**. Un-ionized ammonia concentrations are shown on **Figure 4** as this parameter is present in waste and represents a potential impact to aquatic organisms.

4.2.1 VOC, Metals, Major Ions, PHC and PAH

Surface water quality in samples collected from five locations along Dyment's Creek (see **Figure 2**) met the PWQO for the analyzed parameters, with the following exceptions:

- **Iron (PWQO 300 µg/L) at all sampling locations,** ranging in concentration from 620 µg/L (SWD3 – upstream sample location) to 929 µg/L (SWD4 – between Innisfil and Sanford Streets, Site 5); and,
- **Total phosphorus (Interim PWQO 0.030 mg/L) at all sampling locations,** ranging in concentration from 0.033 mg/L (SWD3 – upstream sample location) to 0.043 mg/L (SWD5 – between John and Innisfil Streets, Site 6), greater than the interim PWQO. Whereas concentrations were slightly higher next to the waste fill, total phosphorous downstream of the waste fill (SWD1 0.036 mg/L) was relatively similar to the upstream sample.

It is noted that iron concentrations in Dyment's Creek upstream of the waste sites exceeded the PWQO during the 2024 sampling event. The results were generally consistent with those from previous years. Higher concentrations of iron are observed at both the upstream sampling location SWD3 (up to 620 µg/L) and the downstream sampling location SWD1 (907 µg/L), indicating that the landfills are not appreciably impacting the quality of the creek.

Phosphorus concentrations were first analyzed and reported in 2023; the results for that year were above the interim PWQO (0.030 (mg/L) at all sampling locations. The results of samples collected in 2024 remain above the PWQO, ranging from 0.033 mg/L (SWD3, the upstream sample) to 0.043 mg/L (SWD5, located in Site 6); the downstream location, SWD1, exhibited a concentration of 0.036 mg/L. The results indicate that the historic waste sites do not substantively contribute phosphorous to Dyment's Creek. Sources of phosphorous in urban runoff include decomposing plant materials, soil particles and fertilizer. It is likely that the phosphorous noted in Dyment's Creek is likely due to other sources and not the landfills directly.

Ammonia, commonly generated from municipal solid waste, was present at low concentrations, ranging from 0.2 mg/L to 0.3 mg/L, consistent with previous results (concentrations ranging between 0.07 mg/L to 0.86 mg/L between 2012 and 2023).

Un-ionized ammonia, calculated based on total ammonia, field pH and temperature was below the PWQO of 0.02 mg/L. Results ranged from 0.002 mg/L (SWD5) to 0.005 mg/L (SWD1, SWD2, and SWD4). Based on our review of historic total ammonia concentrations, the concentrations have not changed substantially over time.

The reported concentrations of TCE in 2024 were all below the PWQO of 20 µg/L. The highest concentration, 4.9 µg/L, was detected at SWD4 (between Innisfil and Sanford Streets. This is down from the maximum concentration detected in 2023 of 19.6 µg/L. Concentrations declined downstream of this to 3.5 µg/L at SWD1 (near Bradford Street).

PAH parameters were reported in only one instance (Fluoranthene) at SWD2 in 2013. These parameters have not been detected at any location sampled for this program since that time. It is further noted that laboratory reportable detection limits are not able to meet the PWQO in some circumstances

In 2023, the City requested that WSP complete additional sampling and assessment to determine if the TCE originated within from the historic waste sites[2]. Based on groundwater flow directions and the presence and concentrations of TCE in upgradient monitoring wells (notably CB10-1, see **Figure 3**), it was determined that the source of TCE in Dyment's Creek in the area of Site 6 is not from the waste and is more likely a part of the North Plume and is not discussed herein.

Surface water is the ultimate receptor for groundwater discharging from the waste sites. Based on the 2024 results, it is concluded that the waste fill is not adversely affecting the surface water quality of Dyment's Creek. No further action beyond continued sampling and assessment is considered necessary based on the 2024 results.

4.2.2 Indicator Parameters

Relative comparisons can be made regarding general water quality for parameters such as electrical conductivity (1,120 o 1,260 µS/cm) and chloride (270 to 360 mg/L), consistent across all sampling locations. These parameter concentrations are likely indicative of higher baseflow from road salt applied along the adjacent roadways in the winter.

The concentrations of the indicator parameters are similar in all surface water samples. This supports the conclusion that the waste fill sites are not adversely impacting the quality Dyment's Creek.

[2] WSP Canada Inc., 2023. Surface Water and Groundwater Investigation in the Vicinity of Dyment's Creek, Barrie, Ontario. Draft technical memorandum provided to the City of Barrie dated May 31, 2023.

4.2.3 Quality Assurance/Quality Control

A blind field duplicate surface water sample was collected during the 2024 sampling program from SWD5. The RPDs for metals, inorganics, and VOC, where calculable, were within the allowable ranges. Concentrations of PHC and PAH parameters were less than the laboratory RDL and RPD values could therefore not be calculated.

Concentrations of analyzed parameters in the field blank sample were less than their respective laboratory detection limits, except select low level metal and inorganic parameters (typically within 5 times the Reportable Detection Level (RDL), where variability is highest) in the field blanks prepared in 2024, which is not unexpected as the blank water is not de-ionized. A dissolved aluminum concentration of 14 µg/L was detected in the field blank, higher than the concentrations reported in the samples, indicating that the elevated reading does not affect the overall findings of the report.

Concentrations of analyzed parameters in the trip blank samples were less than their respective laboratory detection limits. The laboratory indicated that they found no discrepancies or any errors in the data reported. The field sampling protocols were followed and there were no exceedances of the PWQO for these parameters. Based on the detected results, the results of the blank sample analyses are considered acceptable.

Surrogate standard recoveries outside the range, typically, of 50 to 130% are indicative of questionable results for the tested parameters. All analysis were within the criteria and are considered acceptable.

Matrix spike recoveries outside the typical range for individual parameters are indicative of questionable results for the tested parameters. The reported matrix spike recoveries are within the acceptable range.

Based on the above, the associated analytical results are considered to be representative and reproducible.

5 LANDFILL GAS RESULTS

Figure 5 provides a summary plan-view of the highest methane gas concentrations at monitored landfill gas probe locations at the Dyment's Creek Landfills measured in February/March 2024 (under frozen ground conditions). In some cases, the gas probe screens were nearly submerged (i.e., at GP-D2, GP-D13, and GP-D14), which reduces the ability of the probe to accurately represent soil gas concentrations. Due to the high water levels in these areas, migration of LFG that may be present would be limited as this high groundwater table would act as a natural barrier.

Table 3 below provides a summary of 2024 methane gas concentrations. Historical LFG monitoring results are provided on **Table 6** following the text of the report.

Methane gas concentrations above the LEL of 5% in air represent a potential safety hazard at adjacent buildings, as the gas can potentially accumulate within enclosed spaces and result in conditions where open flame or a spark could cause an explosion. As per MECP guidance, a methane concentration of 1% is used herein as an action level to identify results which require further assessment.

The maximum concentration of methane detected in the monitored probes outside of the waste limits in 2024 was 0.3%, below the action level of 1%; most results were non-detect. Data is also included for gas probes located immediately outside of the cut-off wall (i.e., GP-D8, D20 and D23R); monitoring of these locations relative to the LFG control system is further discussed in Section 6.

Table 3: Summary of 2024 Methane Concentrations – Dyment's Creek Landfills

Location	Screen Interval (mbgs)	Screen Installation Description	Date	Depth to Groundwater (mbgs)	Methane Concentration (% by volume)	% Screen Saturation
Site 4						
GP-D7	0.76 - 2.29	Sand and gravel	22-Feb-24	1.89	0.0	26%
			19-Sep-24	2.00	0.0	19%
GP-D26	1.07 – 4.12	Sand, trace to some gravel, trace silt (FILL), overlying sand	22-Feb-24	2.69	0.0	47%
			19-Sep-24	2.84	0.0	42%
GP-D27	0.91 – 3.96	Sand, some gravel, trace silt (FILL) to sand and gravel, some silt, trace asphalt debris (FILL), overlying sand	22-Feb-24	2.31	0.0	54%
			19-Sep-24	2.35	0.2	53%
Site 5						
GP-D15	0.61 – 2.14	Surficial cover overlying sand	22-Feb-24	Dry	0.0	0%
			24-Sep-24	Dry	0.3	0%
GP-D16	1.22 – 2.74	Fine Sand, trace gravel	22-Feb-24	2.17	0.0	38%
			19-Sep-24	2.26	0.0	32%
GP-D17	0.99 – 2.51	Sand, some gravel, trace silt, (FILL) overlying sand, some silt	22-Feb-24	2.22	0.0	19%
			19-Sep-24	2.10	0.2	27%

Location	Screen Interval (mbgs)	Screen Installation Description	Date	Depth to Groundwater (mbgs)	Methane Concentration (% by volume)	% Screen Saturation
GP-D19	1.22 – 2.74	Sand	22-Feb-24	Dry	0.0	0%
			19-Sep-24	Dry	0.0	0%
Site 6						
GP-D1	1.53 – 3.05	Waste	22-Feb-24	1.59	0.0	96%
			19-Sep-24	1.81	0.1	82%
GP-D2	1.52 – 3.05	Construction debris (asphalt) and sand fill	22-Feb-24	2.31	0.0	49%
			19-Sep-24	2.79	0.0	17%
GP-D3**	0.31 – 1.83	Surficial cover overlying waste	22-Feb-24	0.72	13.0	73%
			19-Sep-24	1.09	3.0	48%
GP-D8	1.53 – 3.05	Sand fill overlying waste	22-Feb-24	1.89	0.0	76%
			19-Sep-24	2.07	0.0	64%
GP-D13**	0.46 – 1.98	Waste	22-Feb-24	0.30	69.8	100%
			29-Mar-24	0.37	7.0	100%
			19-Sep-24	0.66	15.0	87%
GP-D14	1.52 – 3.05	Silty sand to fine sand (FILL)	22-Feb-24	1.60	0.0	95%
			19-Sep-24	1.77	0.0	84%
GP-D20	1.37 – 4.42	Sand, trace silt, trace organics (FILL), overlying sand	22-Feb-24	3.41	0.0	33%
			19-Sep-24	3.53	0.0	29%
GP-D21	1.22 – 4.27	Sand, trace gravel, trace silt, trace rootlets (FILL), overlying sand	22-Feb-24	3.34	0.0	30%
			19-Sep-24	3.48	0.0	26%
GP-D23R	1.37 - 4.42	Sand, some gravel, trace silt, trace asphalt debris (FILL), overlying sand	22-Feb-24	2.99	0.0	47%
			19-Sep-24	3.14	0.0	42%

Notes:
** Headspace methane concentration is greater than 5% by volume, the lower explosive limit of methane.

Elevated concentrations of methane were not detected, or was detected at trace levels only, at the gas probes located adjacent to Sites 4, 5 and 6. This is consistent with recent historical results for these locations.

Methane was not detected at the three monitoring locations outside of the cutoff wall at Site 6 (i.e., GP-D8. GP-D20, GP-D21, and GP-D23R. The action level of 1% was not reached at any of these wells.

Elevated concentrations of methane (i.e., greater than 5%) continued to be detected at the two probes (GP-D3 and GP-D13) located in waste on the east side of Site 6, south of the cutoff wall. The results from GP-D13 in February and March are considered questionable as the well screen was entirely saturated at the time of

measurement and it is further noted that the water table was within 0.4 m of ground surface. These data are discussed below.

6 PASSIVE VENTING SYSTEM MONITORING

This section satisfies the requirements outlined in Condition 2.2 of the ECA No. 3118-BD5KTE, which requires the annual report to include:

- the frequency of monitoring adopted;
- the concentration of contaminants discharging in the air;
- the wind speeds and wind directions recorded at the time of monitoring; and
- the results of dispersion calculations, using one of the approved dispersion models listed in Section 6 of O. Reg 419/05, indicating the maximum point of impingement concentrations of contaminants in the gas discharging to air.

The amendment to the ECA (see **Appendix E**) was approved on June 7, 2023 to reduce the monitoring and reporting requirements as originally approved under Item 2.0 of the ECA. The landfill gas barrier and passive venting monitoring and reporting program was approved by the Ministry's District Manager on February 24, 2020 in accordance with Condition 2.1 of the ECA.

Condition 2.3 of the ECA allows the City, upon the submission of the third Annual Report and with approval of the District Manager, to amend the monitoring and reporting requirements under the ECA. The 2022 Annual Monitoring Report in March 2023 is the third Annual Report and accordingly the City requested amendments to the monitoring and reporting requirements as originally approved under Condition 2.1 of the ECA.

Based on the MECP's review of the City's request, the requirements for annual re-modelling of the air quality under Condition 2.2 of the ECA was removed and the monitoring and reporting requirements were updated as follows:

Probe Location	Frequency	Parameter
Probes located within Waste: GP-D1; GP-D2; GP-D3; GP-D8; GP-D13; GP-D14	Semi- Annual Sampling (one frozen ground)	Methane Carbon Dioxide Oxygen Ground Water level
Probes located outside of Waste: GP-D20; GP-D21; GP-D23	Semi- Annual Sampling (one frozen ground)	Methane Carbon Dioxide Oxygen Ground Water level
Passive Gas Venting System: GVP1; GVP2; GVP3	Semi- Annual Sampling (one frozen ground)	Methane Carbon Dioxide Oxygen

There were no complaints received by the City relating to the operation of this system in 2024. No repairs or maintenance of the system were undertaken.

6.1 Gas Monitoring Well Results

Performance of the passive venting and cut-off wall LFG control measures installed at Site 6 is, in part, assessed through monitoring of the gas probes located immediately outside of the cut-off wall (i.e., GP-D8, D20 and D23). Results from these locations in the winter of 2020, prior to construction of the LFG control measures, indicated there was no methane present at any of these locations. This is similarly the case for the recorded methane

concentrations following construction of the LFG control measures, including the winter (March) and fall (September) of 2024 at all three probes. The results indicate that there is no off-site migration of methane in soil-gas from the landfill on City-owned lands in Site 6.

Sampling of the landfill gas probes within the waste at Site 6 in 2024 indicated results consistent with historical data collected at this site. Elevated concentrations of methane are noted at GP-D3 (3.0% to 13.0%) and GP-D13 (7.0% to 69.8%). These concentrations are consistent with typical methane concentrations within waste materials of this age. Whereas the 2024 concentration at GP-D13 in February was slightly higher than typical maximum methane concentrations in these landfills, the data are considered questionable. The effectiveness of the control measures (i.e., the passive venting and cut-off wall) or off-site impacts at Site 6 are discussed below.

6.2 Passive Gas Vent System Monitoring Results

A semi-annual monitoring frequency is required at the three gas venting poles (GVP1 to GVP3); one of the monitoring rounds is completed under frozen ground conditions (March). As part of the gas vent monitoring completed at the Site in 2024, methane (%LEL and %CH4), carbon dioxide (% volume) and oxygen (% volume) were recorded.

A summary of the venting pole monitoring is provided in **Table 4** below. The methane, carbon dioxide and oxygen readings were recorded using a calibrated GEM 5000. The flow rates of landfill gas venting upward within the vent system poles were not measured in 2024 as it is no longer required as of the June 2023 amendment to ECA No. 3118-BD5KTE. The methane readings measured in the GVP were between 0.0 % to 0.3% by volume. The maximum reading of 0.3% was reported at GVP1, GVP2, and GVP3 on March 29, 2024.

Table 4: Summary of 2024 Gas Venting Pole Monitoring

Location	Date	CH4 (% volume)	CO2 (% volume)	O2 (% volume)
GVP1	29-Mar-24	0.3	0.7	20.4
	13-Sept-24	0.0	4.5	16.0
	19-Sept-24	0.0	5.2	15.6
GVP2	29-Mar-24	0.3	0.4	21.2
	13-Sept-24	0.2	6.5	13.8
	19-Sept-24	0.1	0.1	20.9
GVP3	29-Mar-24	0.3	0.1	21.8
	13-Sept-24	0.0	0.1	20.4
	19-Sept-24	0.1	2.0	18.8

6.3 Wind Speed and Direction

Meteorological data was taken from Environment Canada for the Barrie-Oro DDD (Station Number 6117700, available: *climate.weatheroffice.gc.ca/climateData/canada_e.html;* accessed: October 25, 2023). This station is located approximately 20 kilometres (km) north of the Site. This weather station is considered to be adequate to represent Site weather conditions during the sampling periods. A summary of the weather conditions (precipitation, temperature, wind direction and average wind speed) during the semi-annual sampling events is provided in **Table 5** below.

Table 5: Summary of 2024 Weather Conditions during Gas Venting Pole Monitoring

Date	Time	Temperature (°C)	Barometric Pressure (kPa)	Wind Speed (km/h)	Wind Direction (°)
March 29	9:00am	0.4	98	18	320
	10:00am	1.2	97.97	21	299
	11:00am	0.9	98	29	294
September 13	1:00pm	24.6	99.06	5	130
	2:00pm	25.2	99.01	5	94
	3:00pm	25.4	98.97	8	120
September 19	8:00am	16.7	98.36	5	53
	9:00am	19.5	98.35	5	86
	10:00am	21.1	98.32	9	93
	11:00am	22.3	98.29	12	94

6.4 Concentrations of Contaminants Discharging to Air

An Emission Summary and Dispersion Modelling (ESDM) report (Golder, 2019) was originally prepared in 2019 as part of an application for an Environmental Compliance Approval (ECA) for emissions to air under Section 9 of the Environmental Protection Act. Condition 2.2 of the ECA states that the emission calculations and dispersion modelling used to support this ESDM are to be updated annually using the results of the monitoring completed in the previous calendar year, using one of the approved dispersion models listed in Section 6 of O. Reg 419/05. Three years of monitoring of the landfill gas passive venting system have shown that the measured levels of all contaminants have been low and consistently less than 1% of their respective O.Reg. 419/05 air quality limits at the point of impingement location. As a result, this indicates that the system is operating in compliance with the requirements under O.Reg. 419/05 and the ECA. Condition 2.0 of the ECA was thereby amended by the District Manager to remove the requirements for on-going modelling of the air quality under condition 2.2 of the ECA and to reduce the landfill gas monitoring and reporting requirements for the gas venting poles to Methane, Carbon Dioxide and Oxygen only. For this reason, no VOC sampling results are presented in this report and modelling of these emissions was not completed as it is no longer required under the ECA conditions.

7 DISCUSSION AND SUMMARY

7.1 Surface Water Quality

Ammonia, a common municipal solid waste indicator, was present at low concentrations within the stream samples, consistent with previous results. The calculated un-ionized ammonia was below the PWQO of 0.02 mg/L.

Elevated concentrations of iron and phosphorus, above the PWQO, are not considered to indicate landfill related impacts as concentrations in the upstream and downstream samples are not significantly different. The other metal parameters reported for the stream samples tend to fluctuate over time; however, they are generally below the PWQO. The relative trends do not indicate actions required beyond ongoing sampling and assessment described herein.

The reported concentrations of TCE in 2023 were all below the PWQO of 20 µg/L. The highest concentration, 4.9 µg/L, was detected at SWD4 in 2024, lower than historical concentrations. Concentrations declined downstream of this to 3.5 µg/L at SWD1 (near Bradford Street). The source of TCE in Dyment's Creek in the area of Site 6 is not considered to be from the waste.

Surface water is the ultimate receptor for potential groundwater impacts from the historical waste sites. Based on the 2024 results of water quality parameters associated with solid waste, it is concluded that the waste fill is not notably affecting the surface water quality of Dyment's Creek.

Polycyclic aromatic hydrocarbons (PAH) were not detected at any surface water locations in 2024, consistent with 2022 and 2023 results. Whereas occasional detections of PAH have been inconsistently observed, the data indicates stable trends.

7.2 Off-Site Landfill Gas

Methane was not detected in wells constructed surrounding Site 4. As noted in earlier reporting (Golder, 2013), there are historical data and reports indicating that evaluation of LFG within the area of Site 4 was completed however, conditions within the waste or the adjacent building have not been confirmed on these private lands.

Elevated methane (i.e., above 1%) is not present within gas probes located adjacent to Site 5. The results of the available data are similar to historical observations.

Elevated methane (i.e., above 1%) is not present within gas probes located adjacent to Site 6. The results of the available data are similar to historical observations. The LFG control measures at Site 6 are considered to be appropriately managing impacts from waste on City property.

The waste has been in place at these landfill sites for over 50 years and therefore LFG generation is expected to decline slowly. Provided that other controlling conditions at or near the waste fill areas, for example water table elevation, permeability of the soil cover, etc. do not change substantively, off-site methane concentrations are expected to remain within the range of recent results. Should future development be considered in the areas where elevated methane is present (i.e., within the waste fill area), additional investigations would be required.

7.3 Site 6 Landfill Gas Controls

Elevated methane concentrations (i.e., greater than 5% by volume) continue to be measured in 2024 in gas probes located within the waste at Site 6, consistent with typical methane concentrations within waste materials of this age. Elevated methane concentrations are typically present within waste, even in sites more than 25 years

old. No methane was detected at the probes outside of the cut-off wall (i.e., at GP-D8, GP-D20, GP-D21, and GP-D23R). Monitoring at the three gas venting poles (GVP1 to GVP3) in March and September 2024 indicated methane concentrations of between 0.0 % to 0.3% by volume indicating that methane from the waste is not migrating beyond the cut-off wall. It is concluded that the LFG control measures at Site 6 are effective at controlling off-site migration of LFG from waste on the City-owned property to the adjacent residential areas.

7.4 Summary

- Surface water quality remains stable in comparison to historical data. Surface water is the ultimate receptor for potential groundwater impacts from the historical waste sites. Based on the results obtained during this investigation during the 2024 sampling event, it is concluded that the historic waste sites are not adversely affecting surface water quality of Dyment's Creek;
- Polycyclic aromatic hydrocarbons (PAH) were not detected at any surface water locations in 2024, consistent with 2022 and 2023 results. Whereas occasional detections of PAH have been inconsistently observed, the data indicates stable trends; and,
- Methane concentrations in wells surrounding Site 4, Site 5 and outside the passive barrier system installed at Site 6 were less than 1% (by volume). The results of the available data are similar to historical observations. Based on the concentration of methane in the gas probes outside of the cut-off wall at Site 6 it is concluded that the LFG control measures at Site 6 are effective at controlling off-site migration of LFG from waste on the City-owned property to the adjacent residential areas.

8 LIMITATIONS

This report was prepared for the exclusive use of the City of Barrie and has been prepared as part of environmental due diligence activities and is not intended to be utilized as supporting documentation for a Record of Site Condition under Ontario Regulation 153/04.

WSP's professional services for this assignment addressed only the geo-environmental (chemical and soil gas) aspects of the subsurface conditions at this site. The geotechnical (physical) aspects, including engineering recommendations for the design and construction of building foundations, pavements, underground servicing and the like are outside the terms of reference for this report and have not been investigated or addressed.

This report is based on data and information collected during the subsurface environmental investigations conducted by WSP and is based solely on-site conditions encountered at the time of the field work (i.e., 2024), as described in this report.

In evaluating the site, WSP has relied in good faith on information provided by others and evaluated only conditions at a limited number of test locations. Only limited chemical analyses of soil samples were carried out. It should be noted that the results of an investigation of this nature should, in no way, be construed as a warranty that the Sites are free from any and all contamination from past or current practices.

We accept no responsibility for any deficiency, misstatements or inaccuracies contained in this report as a result of omission, misinterpretations or fraudulent acts of the persons interviewed. WSP accepts no responsibility for any reduction in property value, either real or perceived, as a result of the reporting of factual information herein.

This assessment was carried out using existing historical information as available from various agencies and no assurance is made regarding the accuracy or completeness of this information.

If additional information is obtained during future work at the sites, including excavations, borings, or other studies, and/or if conditions exposed during construction are different from those encountered in this assessment, WSP should be requested to re-evaluate the conclusions presented in this report and provide amendments as required.

9 REFERENCES

The following references were reviewed for the purposes of preparing this report:

- Ministry of Environment, Conservation and Parks, 2021. D-4-1 Assessing Methane Hazards from Landfill Sites. Dated May 18, 2016, amended July 13, 2021.
- Ministry of Environment and Energy, 1994. *Provincial Water Quality Objectives*, dated July 1994.
- WSP Canada Inc., 2024. *Dyment's Creek Landfill - 2023 Annual Monitoring Program Report*. Report prepared for the City of Barrie, dated February 2, 2024.
- Yang & Toor, 2018. Stormwater runoff driven phosphorous transport in an urban residential catchment: Implications for protecting water quality in urban watersheds. Authored by Yun-Ya Yang and Gurpal S. Toor. Published August 3, 2018 at **https://www.nature.com/articles/s41598-018-29857-x**.

Signature Page

WSP Canada Inc.

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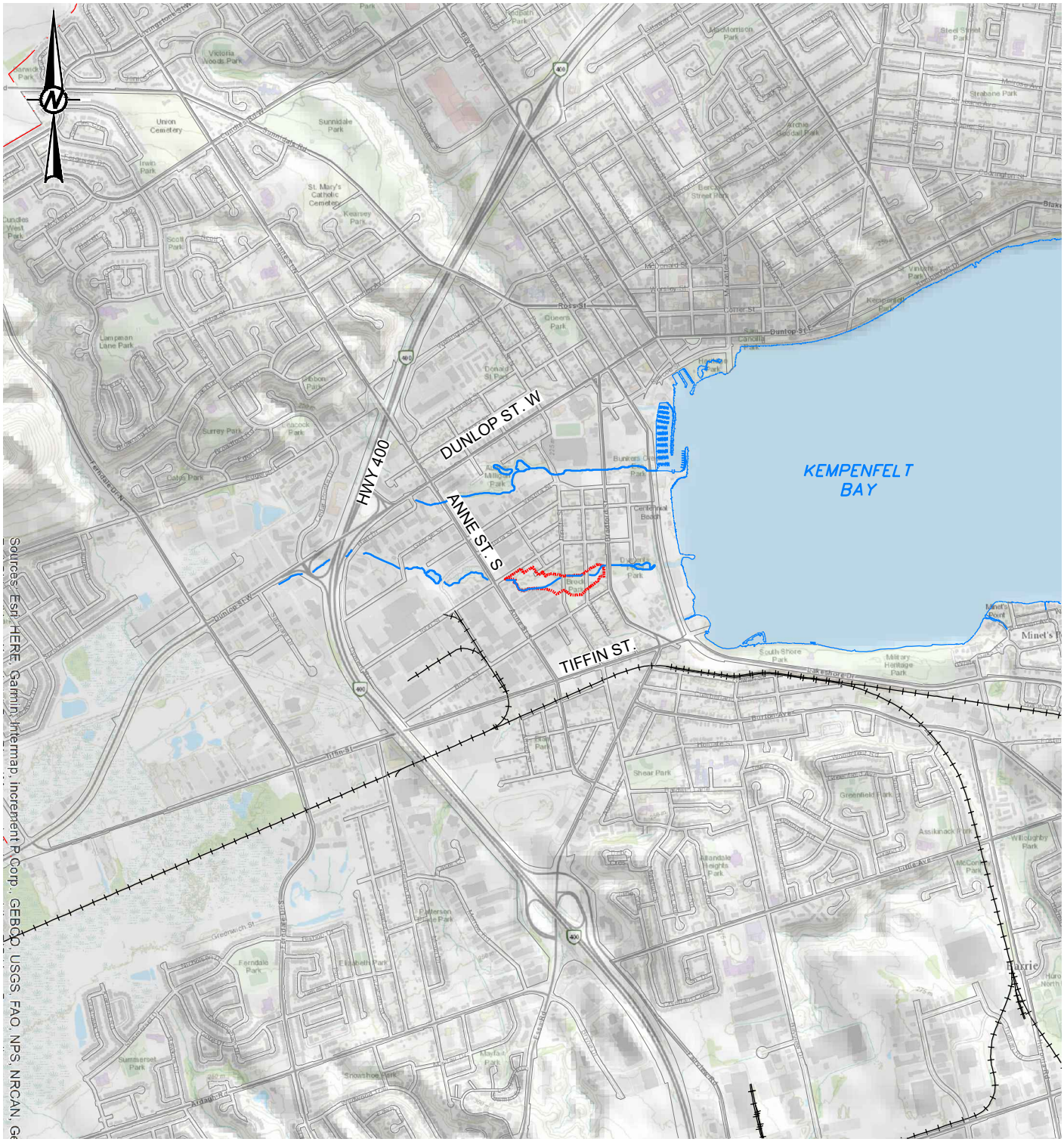
Principal, Senior Env. Scientist

Paul Dewaele, P.Eng.
Senior Geo-Env. Engineer, Northern Geo-Environmental

CLG/PJD/ms

Figures



D4 Assessment Area

NOTES:

1. Datum is NAD UTM 83 Zone 17
2. Mapping Based on County of Simcoe Municipal Base
3. 500 m Offset D4 Assessment as per City of Barrie 2009 Official Plan

0 500 1,000
1:30,000 METRES

CLIENT
CITY OF BARRIE

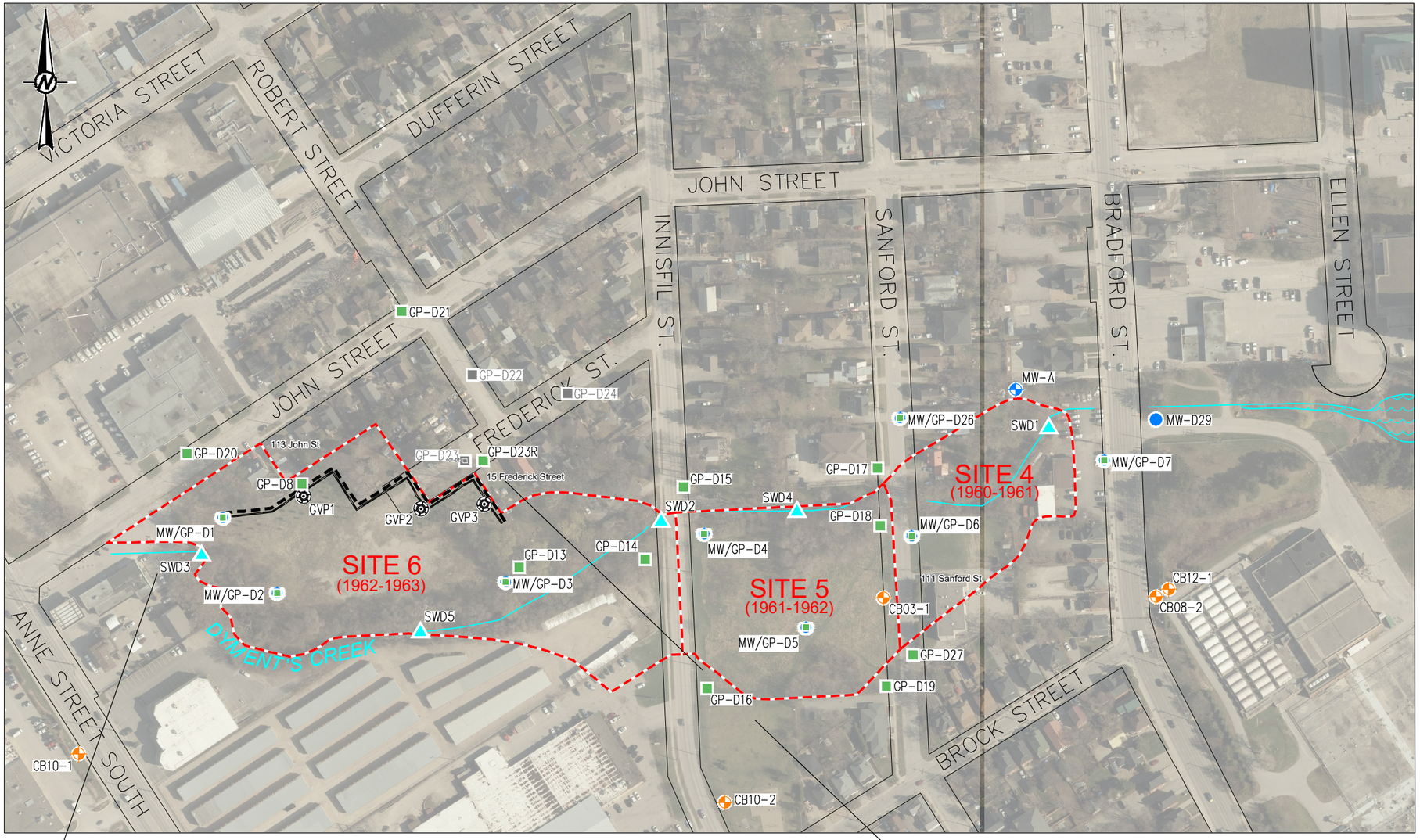
PROJECT
DYMENTS CREEK HISTORICAL LANDFILL
2024 ANNUAL MONITORING REPORT

CONSULTANT
wsp

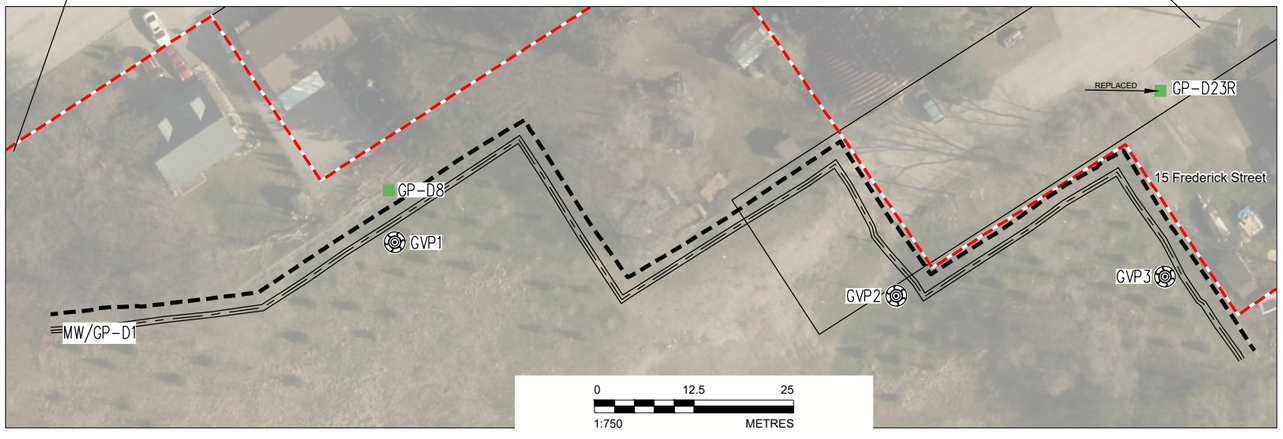
YYYY-MM-DD	2024-10-01
DESIGNED	
PREPARED	JPR
REVIEWED	
APPROVED	CLG

TITLE
REGIONAL LOCATION MAP

PROJECT NO.	CONTROL	REV.	FIGURE
23592540	0004	----	1



CLOSE-UP OF SITE 6 LANDFILL GAS VENTING SYSTEM



LEGEND:

- Estimated Waste Limit
- Alignment of Sheet Pile Wall
- Gas Vent Trench
- Gas Probe
- Monitoring Well
- Monitoring Well / Gas Probe
- Surface Water Sampling Location
- Monitoring Well Completed by Others
- City of Barrie Monitoring Well
- Gas Venting Pole

NOTES:

1. Datum is NAD83 Zone 17
2. All Mapped Boundaries, Limits, and Interpolated Features are Approximate
3. CAD Base Digital 1:2000 Municipal Mapping Courtesy City of Barrie
4. Image City of Barrie 2022, Site Features are Approximate to Geodetic Alignment
5. Site 6 Operational from 1962-1963, Site 5 Operational from 1961-1962, and Site 4 Operational from 1960-1961
6. Monitors GP-D22 & GP-D24 Decommissioned 2024; GP-D23 replaced with GP-D23R (10 m east of original location)

CLIENT
CITY OF BARRIE

PROJECT
DYMENTS CREEK HISTORICAL LANDFILL
2024 ANNUAL MONITORING REPORT

CONSULTANT
wsp

YYYY-MM-DD	2024-10-01
DESIGNED	
PREPARED	JPR
REVIEWED	
APPROVED	CLG

TITLE
SAMPLING LOCATION MAP

PROJECT NO.	CONTROL	REV.	FIGURE
23592540	0004	----	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

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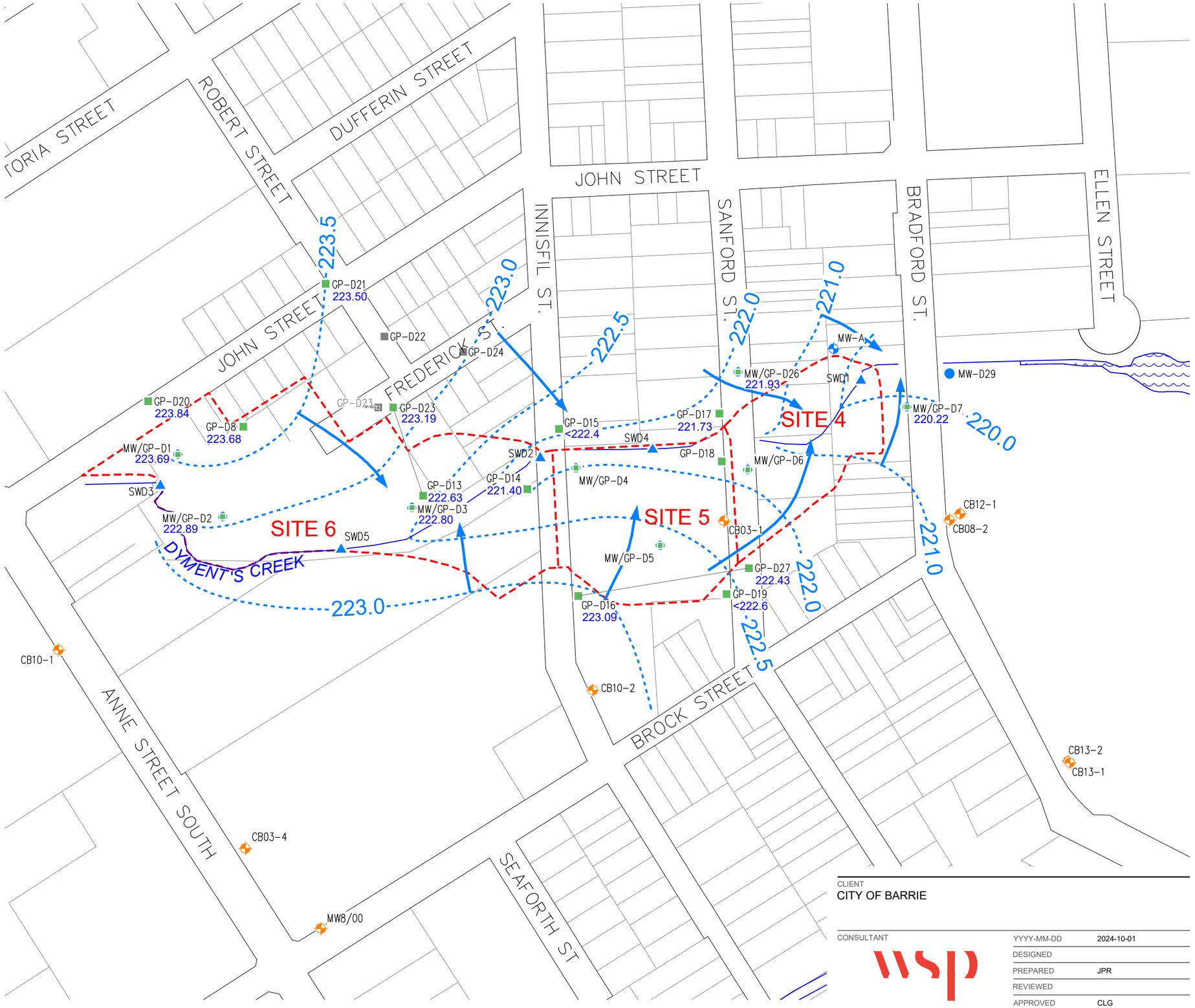

LEGEND:

- Estimated Waste Limit
- Surface Water Station
- Gas Probe
- Monitoring Well / Gas Probe
- Monitoring Well Completed by Others
- City of Barrie Monitoring Well
- Interpolated Equipotential Line
- Interpolated Groundwater Flow Direction
- 222.62 — Shallow Static Water Elevation (masl)

0 50 100
1:2,500 METRES

NOTES:

1. Datum is NAD83 Zone 17
2. All Mapped Boundaries, Limits, and Features are Approximate
3. CAD Base Digital 1:2000 Municipal Mapping Courtesy City of Barrie
4. Shallow Static Water Elevations Taken February 2024

CLIENT
CITY OF BARRIE

CONSULTANT
wsp

YYYY-MM-DD	2024-10-01
DESIGNED	
PREPARED	JPR
REVIEWED	
APPROVED	CLG

PROJECT
DYMENTS CREEK HISTORICAL LANDFILL
2024 ANNUAL MONITORING REPORT

TITLE
GROUNDWATER ELEVATIONS FEBRUARY 2024

PROJECT NO.	CONTROL	REV.	FIGURE
23592540	0004	----	3

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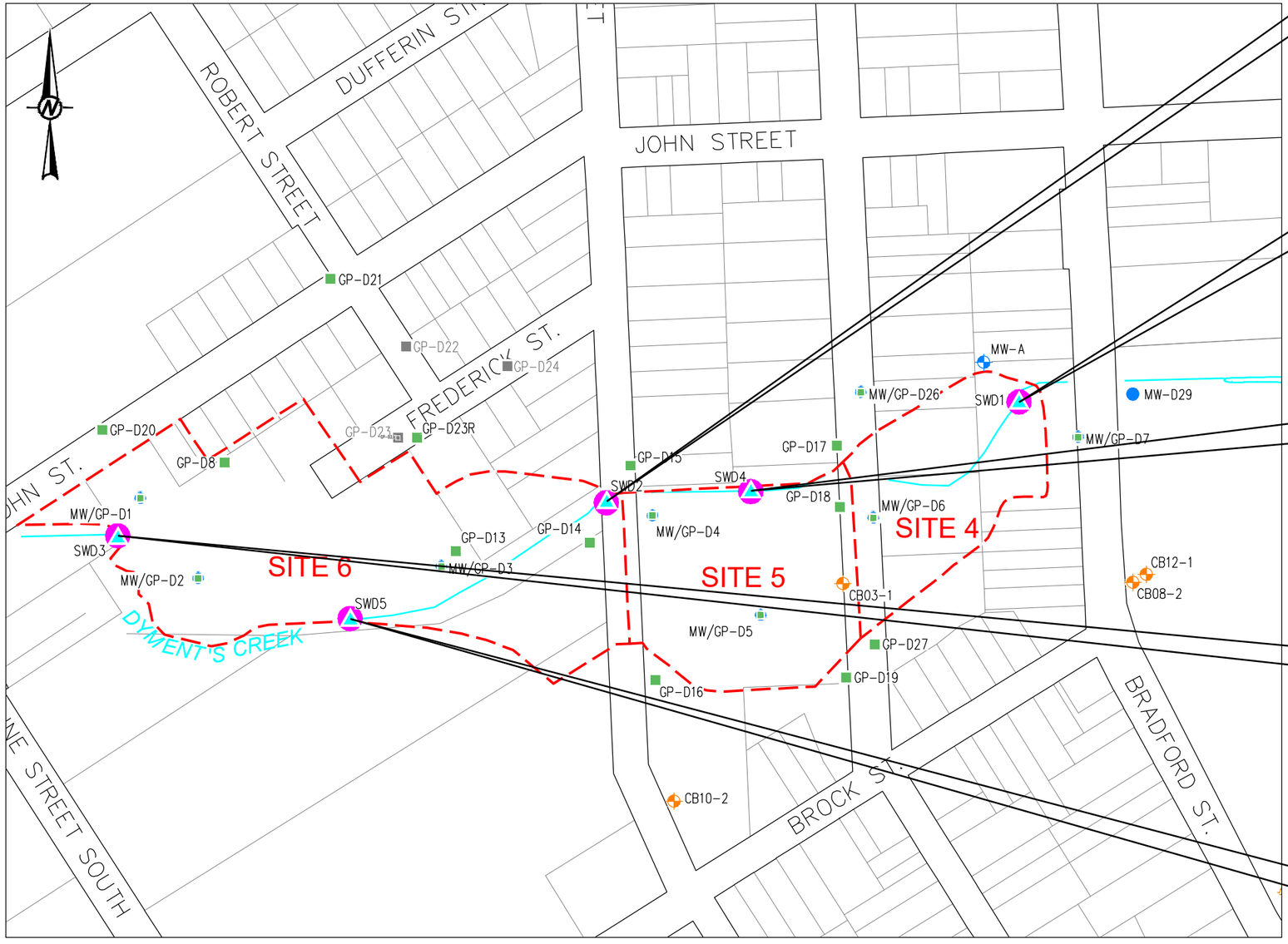


LEGEND:

- Estimated Waste Limit
- Gas Probe
- Monitoring Well
- Monitoring Well / Gas Probe
- Monitoring Well Completed by Others
- City of Barrie Monitoring Well
- Surface Water Sampling Location
- <PWQO
- >PWQO
- 501 — Exceedance of PWQO

NOTES:

1. Datum is NAD83 Zone 17
2. All Mapped Boundaries, Limits, and Interpolated Features are Approximate
3. CAD Base Digital 1:2000 Municipal Mapping Courtesy City of Barrie
4. PWQO = Provincial Water Quality Objectives, July 1994

SWD2

Parameter	Units	PWQO	Results								
			May-21	Sep-21	Apr-22	Sep-22	Nov-22	Apr-23	Aug-23	Oct-23	Sep-24
Metals											
Copper	µg/L	5	1.3/1.3	1.2	1.9/2.1	2.0	-	4.2	2.8	2.3	1.0
Volatile Organic Compounds											
Trichloroethylene	µg/L	20	0.48/0.51	1.5	0.46/0.46	41	0.43/0.42	0.5	< 0.5	19.6	0.70
Polynuclear Aromatic Hydrocarbons											
Fluoranthene	µg/L	0.0008	<0.010/<0.010	<0.010	<0.050	<0.050	-	< 0.1	< 0.1	< 0.1	< 0.1
Landfill Tracer Parameters											
Iron	µg/L	300	1200/1200	690	1100/1100	1100	-	1870	864	1400	893
Phosphorus (Total)	mg/L	0.030	-	-	-	-	-	-	0.045	0.060	0.039
Unionized Ammonia	mg/L	0.02	0.010/0.009	0.015	0.004	0.007	-	0.002	0.007	0.007	0.005

SWD1

Parameter	Units	PWQO	Results								
			May-21	Sep-21	Apr-22	Sep-22	Nov-22	Apr-23	Aug-23	Oct-23	Sep-24
Metals											
Copper	µg/L	5	1.4	1.4	1.9	1.5	-	2.2	2.8	2.4	1.0
Tungsten	µg/L	30	<1	<1	<1.0	<1.0	-	0.14	0.12	0.13	<0.2
Volatile Organic Compounds											
Trichloroethylene	µg/L	20	3.6	4.5	8.1	6.2	-	2.9	3.9	6.5	3.5
Landfill Tracer Parameters											
Iron	µg/L	300	1300	780	1200	980	-	1550	867	1370	907
Phosphorus (Total)	mg/L	0.030	-	-	-	-	-	-	0.044	0.053	0.036
Unionized Ammonia	mg/L	0.02	0.014	0.019	0.006	0.008	-	0.004	0.006	0.008	0.005

SWD4

Parameter	Units	PWQO	Results							
			Apr-22	Sep-22	18-Nov-22	29-Nov-22	Apr-23	Aug-23	Oct-23	Sep-24
Metals										
Copper	µg/L	5	2.0	1.3	-	-	2.1	2.8	1.8	1.0
Mercury - Dissolved	µg/L	0.2	-	<0.10	-	-	< 0.01	< 0.01	< 0.01	< 0.01
Volatile Organic Compounds										
Trichloroethylene	µg/L	20	10	5.8	2.9	2.0	2.8	5.6	10.1	4.9
Landfill Tracer Parameters										
Iron	µg/L	300	1100	1000	-	-	1250	852	1210	929
Phosphorus (Total)	mg/L	0.030	-	-	-	-	-	0.042	0.048	0.034
Unionized Ammonia	mg/L	0.02	0.006	0.007	-	-	0.003	0.008	0.007	0.005

SWD3

Parameter	Units	PWQO	Results								
			May-21	Sep-21	Apr-22	Sep-22	Nov-22	Apr-23	Aug-23	Oct-23	Sep-24
Metals											
Copper	µg/L	5	1.4	1.2	2.6	2.5	-	7.7	4.3	2.7	<1.0
Mercury - Dissolved	µg/L	0.2	<0.1	<0.1	-	<0.10	-	< 0.01	< 0.01	< 0.01	< 0.01
Tungsten	µg/L	30	<1	<1	<1.0	<1.0	-	0.10	0.19	0.19	<0.2
Zirconium	µg/L	4	<1	<1	<1.0	<1.0	-	-	-	-	<2
Volatile Organic Compounds											
Trichloroethylene	µg/L	20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	<0.5	<0.5
Landfill Tracer Parameters											
Iron	µg/L	300	810	750	1600	1200	-	861	2400	1310	620
Phosphorus (Total)	mg/L	0.030	-	-	-	-	-	-	0.080	0.063	0.033
Unionized Ammonia	mg/L	0.02	0.003	0.008	0.005	0.005	-	< 0.001	0.015	0.005	0.004

SWD5

Parameter	Units	PWQO	Results							
			Apr-22	Sep-22	18-Nov-22	29-Nov-22	Apr-23	Aug-23	Oct-23	Sep-24
Metals										
Aluminum	µg/L	75	6	8	-	-	10/10	8	5/6	5/6
Cadmium	µg/L	0.2	<0.090	<0.090	-	-	0.013/0.009	0.010	0.017/0.024	0.029/0.030
Copper	µg/L	5	2.5	2.0	-	-	1.6/1.3	3.0	3.4/2.3	2.0/1.0
Lead	µg/L	5	<0.50	0.59	-	-	0.24/0.24	0.29	1.31/1.29	1.50/1.85
Zinc	µg/L	30	7.5	8.4	-	-	11-Jun	9	10/10	5/6
Volatile Organic Compounds										
Trichloroethylene	µg/L	20	0.54	0.49	0.39/0.42	0.49	< 0.5/< 0.5	< 0.5	0.6/0.7	0.5/0.7
Landfill Tracer Parameters										
Iron	µg/L	300	800	960	-	-	1080/870	752	1470/1500	919/885
Phosphorus (Total)	mg/L	0.030	-	-	-	-	-	0.040	0.063/0.064	0.040/0.043
Unionized Ammonia	mg/L	0.02	0.003	0.005	-	-	<0.001/0.015	0.004	0.006/0.006	0.002/0.002

CLIENT
CITY OF BARRIE

CONSULTANT
wsp

YYYY-MM-DD	2024-10-01
DESIGNED	
PREPARED	JPR
REVIEWED	
APPROVED	CLG

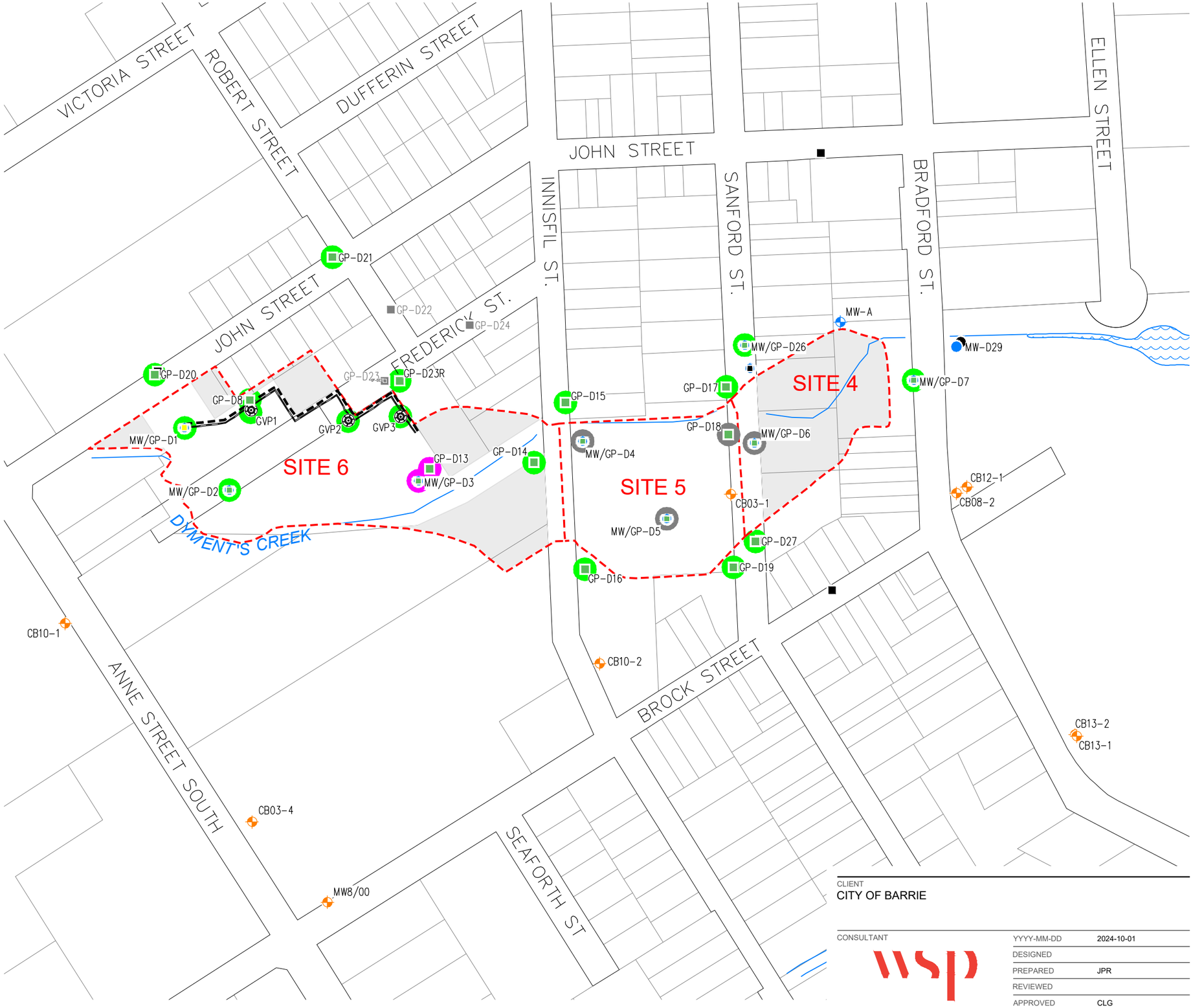
PROJECT
DYMENTS CREEK HISTORICAL LANDFILL
2024 ANNUAL MONITORING REPORT

TITLE
SURFACE WATER RESULTS

PROJECT NO.	CONTROL	REV.	FIGURE
23592540	0004	----	4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25 mm



LEGEND:

- Estimated Waste Limit
- Alignment of Sheet Pile Wall
- Gas Vent Trench
- Gas Probe (Typical Screen Saturation <50%)
- Gas Probe (Typical Screen Saturation 50% - 90%)
- Gas Probe (Typical Screen Saturation >90%)
- Monitoring Well
- Monitoring Well / Gas Probe (Typical Screen Saturation <50%)
- Monitoring Well / Gas Probe (Typical Screen Saturation 50% - 90%)
- Monitoring Well / Gas Probe (Typical Screen Saturation >90%)
- Monitoring Well Completed by Others
- City of Barrie Monitoring Well
- Gas Venting Pole
- <% Methane Gas Concentration
- 1% - 4.9% Methane Gas Concentration
- >5.0% Methane Gas Concentration
- Methane Gas Concentration Not Monitored
- Privately Owned Property Within Estimated Landfill Limits

0 50 100
1:2,500 METRES

NOTES:

1. Datum is NAD83 Zone 17
2. All Mapped Boundaries, Limits, and Features are Approximate
3. CAD Base Digital 1:2000 Municipal Mapping Courtesy City of Barrie
4. Readings Represent Highest Reading(s) Sampling Events 2024
6. Monitors GP-D22 & GP-D24 Decommissioned 2024; GP-D23 replaced with GP-D23R (10 m east of original location)

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CITY OF BARRIE

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YYYY-MM-DD	2024-10-01
DESIGNED	
PREPARED	JPR
REVIEWED	
APPROVED	CLG

PROJECT
DYMENTS CREEK HISTORICAL LANDFILL
2024 ANNUAL MONITORING REPORT

TITLE
METHANE GAS CONCENTRATIONS

PROJECT NO.	CONTROL	REV.	FIGURE
23592540	0004	----	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

Tables

Table 6
Landfill Gas Concentrations (% methane by volume)
Dyment's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	**Water** (mbgs)	**Site**	**Sample Date**	**CH4 (%)**	**CO2 (%)**	**O2 (%)**	**Bal. (%)**
GP-D1		Site 6	28-Jun-12	0.0	0.0	17.8	82.2
GP-D1	1.86	Site 6	17-Sep-12	No Reading Taken			
GP-D1		Site 6	18-Oct-12	0.4	4.8	11.3	83.5
GP-D1	1.67	Site 6	03-Dec-12	0.0	2.2	16.4	81.4
GP-D1	1.65	Site 6	18-Dec-12	0.5	1.3	17.9	80.3
GP-D1	1.46	Site 6	04-Apr-13	0.0	2.1	12.7	85.2
GP-D1	1.64	Site 6	20-Jun-13	0.0	2.1	17.6	80.3
GP-D1	1.68	Site 6	22-Aug-13	0.1	5.8	12.9	81.2
GP-D1	1.71	Site 6	11-Oct-13	0.1	0.9	20.1	79.0
GP-D1	1.68	Site 6	13-Dec-13	0.1	1.0	22.3	76.6
GP-D1	1.76	Site 6	12-Feb-14	0.0	1.6	21.1	77.3
GP-D1	1.62	Site 6	27-Nov-14	0.0	1.1	20.6	78.3
GP-D1	1.62	Site 6	11-Mar-15	0.1	1.1	21.1	77.7
GP-D1	1.83	Site 6	21-Sep-15	0.0	4.7	17.0	78.3
GP-D1	1.57	Site 6	14-Dec-15	1.1	1.6	18.5	78.8
GP-D1	1.31	Site 6	28-Feb-17	0.0	0.1	22.0	77.9
GP-D1	1.42	Site 6	23-Feb-18	0.0	0.1	22.0	77.9
GP-D1	1.88	Site 6	29-Aug-19	0.0	2.4	17.6	80.0
GP-D1	1.61	Site 6	09-Mar-20	0.0	1.2	18.2	80.6
GP-D1	2.37	Site 6	11-Sep-20	0.0	1.6	19.9	78.5
GP-D1	1.65	Site 6	03-Feb-21	0.1	0.8	20.8	78.3
GP-D1	1.70	Site 6	17-Sep-21	0.0	1.0	20.8	78.2
GP-D1	1.66	Site 6	25-Jan-22	0.0	0.2	22.3	77.5
GP-D1	1.80	Site 6	28-Sep-22	0.0	2.3	19.7	78.0
GP-D1	1.51	Site 6	23-Feb-23	0.0	0.4	21.8	77.8
GP-D1	1.79	Site 6	29-Aug-23	0.0	1.9	19.3	78.8
GP-D1	1.59	Site 6	22-Feb-24	0.0	0.0	21.5	78.5
GP-D1	1.81	Site 6	19-Sep-24	0.1	0.3	20.2	79.4
GP-D2		Site 6	15-Jun-12	**9.2**	-	-	-
GP-D2		Site 6	28-Jun-12	**6.6**	5.9	11.2	76.4
GP-D2	2.62	Site 6	17-Sep-12	No Reading Taken			
GP-D2		Site 6	18-Oct-12	**10.4**	12.0	8.8	68.8
GP-D2	2.42	Site 6	03-Dec-12	**15.8**	14.1	4.9	65.2
GP-D2	2.36	Site 6	18-Dec-12	**18.6**	15.5	2.2	63.7
GP-D2	2.16	Site 6	04-Apr-13	**16.8**	12.7	1.4	69.1
GP-D2	2.43	Site 6	20-Jun-13	**19.6**	13.5	1.4	65.5
GP-D2	2.62	Site 6	22-Aug-13	**16.8**	6.3	2.1	64.7
GP-D2	2.48	Site 6	11-Oct-13	**20.6**	16.7	3.0	59.7
GP-D2	2.42	Site 6	13-Dec-13	**13.6**	10.8	11.0	64.6
GP-D2	2.54	Site 6	12-Feb-14	**17.0**	13.8	4.7	64.5
GP-D2	2.37	Site 6	27-Nov-14	**21.0**	15.7	4.5	58.8
GP-D2	2.37	Site 6	11-Mar-15	**16.7**	14.3	1.1	67.9
GP-D2	2.55	Site 6	21-Sep-15	**15.4**	18.8	2.3	63.5
GP-D2	2.21	Site 6	14-Dec-15	**19.2**	16.3	1.2	63.3
GP-D2	1.95	Site 6	14-Mar-16	**22.3**	13.5	0.6	63.6
GP-D2	2.63	Site 6	06-Sep-16	1.2	11.7	7.1	80.0
GP-D2	2.06	Site 6	28-Feb-17	**9.0**	13.7	0.7	76.6
GP-D2	2.07	Site 6	23-Feb-18	**8.5**	14.8	10.6	75.2
GP-D2	2.42	Site 6	09-Mar-20	0.0	12.3	2.6	85.1
GP-D2	2.42	Site 6	03-Feb-21	3.3	13.5	1.4	81.8
GP-D2	2.40	Site 6	17-Sep-21	0.0	14.5	3.8	81.7
GP-D2	2.47	Site 6	25-Jan-22	3.7	7.9	9.7	78.7
GP-D2	2.57	Site 6	28-Sep-22	0.0	13.1	6.8	80.1
GP-D2	2.22	Site 6	23-Feb-23	0.4	10.7	4.5	84.4
GP-D2	2.55	Site 6	29-Aug-23	0.0	9.1	10.7	80.2
GP-D2	2.31	Site 6	22-Feb-24	0.0	0.0	20.7	79.3
GP-D2	2.79	Site 6	19-Sep-24	0.0	10.8	9.8	79.3

Table 6
Landfill Gas Concentrations (% methane by volume)
Dyment's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	**Water** (mbgs)	**Site**	**Sample Date**	**CH4 (%)**	**CO2 (%)**	**O2 (%)**	**Bal. (%)**
GP-D3	0.81	Site 6	21-Mar-12	**65.2**	11.0	4.0	19.7
GP-D3		Site 6	22-Mar-12	**57.3**	12.0	4.1	26.6
GP-D3		Site 6	28-Jun-12	**23.1**	15.7	5.7	54.3
GP-D3	1.20	Site 6	17-Sep-12	No Reading Taken			
GP-D3		Site 6	18-Oct-12	**35.1**	19.0	6.9	30.0
GP-D3	0.81	Site 6	03-Dec-12	**29.4**	11.1	12.4	47.1
GP-D3	0.91	Site 6	18-Dec-12	**11.5**	5.3	17.1	66.1
GP-D3	0.74	Site 6	04-Apr-13	**18.2**	3.6	15.5	62.7
GP-D3	0.98	Site 6	20-Jun-13	**17.8**	9.7	10.3	62.2
GP-D3	1.23	Site 6	22-Aug-13	**43.8**	24.7	2.7	29.2
GP-D3	0.94	Site 6	11-Oct-13	**25.2**	11.5	13.3	49.9
GP-D3	0.97	Site 6	13-Dec-13	**10.8**	5.5	19.6	64.1
GP-D3	1.03	Site 6	12-Feb-14	**50.7**	16.9	2.8	29.6
GP-D3		Site 6	27-Nov-14	Well Damaged- No Reading Taken			
GP-D3		Site 6	11-Mar-15	Well Damaged- No Reading Taken			
GP-D3		Site 6	21-Sep-15	Well Damaged- No Reading Taken			
GP-D3	0.79	Site 6	14-Dec-15	**19.4**	7.9	15.1	57.6
GP-D3	0.38	Site 6	14-Mar-16	**5.0**	1.1	21.4	72.6
GP-D3	1.83	Site 6	06-Sep-16	**18.4**	17.3	7.1	57.2
GP-D3	0.62	Site 6	28-Feb-17	0.3	0.4	21.8	77.5
GP-D3	0.45	Site 6	23-Feb-18	0.0	0.1	22.0	77.9
GP-D3	0.79	Site 6	09-Mar-20	**13.9**	4.2	15.3	66.6
GP-D3	0.93	Site 6	11-Sep-20	**8.1**	6.5	15.1	70.3
GP-D3	0.83	Site 6	03-Feb-21	**34.3**	9.8	11.2	44.7
GP-D3	0.41	Site 6	17-Sep-21	**12.5**	6.9	15.8	64.8
GP-D3	0.80	Site 6	25-Jan-22	0.0	0.3	21.9	77.8
GP-D3	0.89	Site 6	28-Sep-22	**17.7**	14.7	7.6	60.0
GP-D3	0.72	Site 6	23-Feb-23	**3.6**	1.3	21.2	73.9
GP-D3	0.97	Site 6	29-Aug-23	**28.1**	12.4	10.7	48.8
GP-D3	0.72	Site 6	22-Feb-24	**13.0**	3.2	17.7	66.1
GP-D3	1.09	Site 6	19-Sep-24	3.0	7.2	14.4	75.4
GP-D7		Site 4	15-Jun-12	0.0	-	-	-
GP-D7		Site 4	28-Jun-12	0.0	0.8	14.2	85.0
GP-D7	1.88	Site 4	17-Sep-12	No Reading Taken			
GP-D7		Site 4	18-Oct-12	0.0	0.3	20.1	79.6
GP-D7	1.85	Site 4	03-Dec-12	0.0	1.1	16.7	82.2
GP-D7	1.85	Site 4	18-Dec-12	0.0	1.2	16.5	82.3
GP-D7	1.70	Site 4	04-Apr-13	0.0	0.4	19.2	80.4
GP-D7	1.75	Site 4	20-Jun-13	0.0	0.7	14.0	85.3
GP-D7	1.92	Site 4	22-Aug-13	0.0	2.6	13.7	83.6
GP-D7	1.85	Site 4	11-Oct-13	0.0	1.1	17.6	81.2
GP-D7	1.85	Site 4	13-Dec-13	0.0	0.7	20.8	78.5
GP-D7	1.94	Site 4	13-Feb-14	0.0	1.5	19.2	79.3
GP-D7	1.87	Site 4	27-Nov-14	0.0	1.5	16.9	81.6
GP-D7	1.87	Site 4	11-Mar-15	0.0	0.6	21.3	78.1
GP-D7	2.09	Site 4	21-Sep-15	0.0	3.9	12.4	83.7
GP-D7	2.04	Site 4	14-Dec-15	0.0	2.0	15.0	83.0
GP-D7	1.76	Site 4	28-Feb-17	0.0	0.5	17.4	82.1
GP-D7	2.02	Site 4	08-Sep-17	0.0	3.0	13.3	83.7
GP-D7	1.87	Site 4	23-Feb-18	0.7	0.4	20.9	78.0
GP-D7	2.02	Site 4	04-Sep-18	0.0	3.4	12.7	83.9
GP-D7	1.80	Site 4	01-Apr-19	0.0	0.0	20.8	79.2
GP-D7	2.03	Site 4	29-Aug-19	1.0	0.2	19.5	79.3
GP-D7	1.78	Site 4	14-Feb-20	0.0	0.0	20.6	79.4
GP-D7	2.06	Site 4	11-Sep-20	0.0	1.7	16.0	82.3
GP-D7	2.05	Site 4	03-Feb-21	0.0	0.7	18.0	81.3
GP-D7	2.03	Site 4	20-Sep-21	0.0	2.0	15.4	82.6
GP-D7	1.94	Site 4	25-Jan-22	0.0	0.5	20.3	79.2
GP-D7	1.87	Site 4	28-Sep-22	0.1	0.1	21.7	78.1
GP-D7	1.86	Site 4	20-Mar-23	0.0	0.4	18.7	80.9
GP-D7	1.98	Site 4	30-Aug-23	0.0	1.5	17.2	81.3
GP-D7	1.89	Site 4	22-Feb-24	0.0	0.0	21.0	79.0
GP-D7	2.00	Site 4	19-Sep-24	0.0	1.8	15.5	82.7

Table 6
Landfill Gas Concentrations (% methane by volume)
Dyment's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	**Water** (mbgs)	**Site**	**Sample Date**	**CH4 (%)**	**CO2 (%)**	**O2 (%)**	**Bal. (%)**
GP-D8		Site 6	15-Jun-12	0.0	-	-	-
GP-D8		Site 6	28-Jun-12	0.0	0.0	18.1	81.9
GP-D8		Site 6	18-Oct-12	0.2	0.8	20.3	78.8
GP-D8	1.99	Site 6	03-Dec-12	0.2	0.5	20.8	78.5
GP-D8	1.96	Site 6	18-Dec-12	0.0	0.5	21.0	78.5
GP-D8	1.79	Site 6	04-Apr-13	0.0	0.3	20.3	79.4
GP-D8	1.91	Site 6	20-Jun-13	0.1	0.5	19.3	80.1
GP-D8	2.11	Site 6	22-Aug-13	0.0	0.9	20.2	78.9
GP-D8	2.04	Site 6	11-Oct-13	0.1	0.5	21.0	78.4
GP-D8	1.96	Site 6	13-Dec-13	0.0	0.5	20.8	78.7
GP-D8	2.10	Site 6	12-Feb-14	0.0	0.8	22.6	76.6
GP-D8	1.76	Site 6	27-Nov-14	0.0	0.8	21.0	78.2
GP-D8	1.76	Site 6	11-Mar-15	0.0	0.9	21.8	77.3
GP-D8	2.14	Site 6	21-Sep-15	0.0	1.4	20.8	77.8
GP-D8	1.93	Site 6	14-Dec-15	0.2	0.6	20.5	78.7
GP-D8	1.66	Site 6	14-Mar-16	0.1	0.3	22.2	77.4
GP-D8	2.18	Site 6	06-Sep-16	0.1	1.1	19.0	79.8
GP-D8	1.57	Site 6	28-Feb-17	0.0	0.4	21.6	78.0
GP-D8	2.00	Site 6	08-Sep-17	0.1	0.8	20.6	78.5
GP-D8	1.39	Site 6	23-Feb-18	0.0	0.1	22.0	77.9
GP-D8	2.92	Site 6	04-Sep-18	0.0	0.8	20.2	79.0
GP-D8	1.78	Site 6	01-Apr-19	0.0	0.6	19.7	79.6
GP-D8	2.18	Site 6	29-Aug-19	0.0	0.4	19.7	79.9
GP-D8	1.80	Site 6	14-Feb-20	0.0	0.3	20.1	79.6
GP-D8	2.03	Site 6	11-Sep-20	0.0	1.9	19.8	78.3
GP-D8	1.94	Site 6	03-Feb-21	0.0	0.5	20.6	78.9
GP-D8	1.96	Site 6	17-Sep-21	0.0	0.3	21.7	78.0
GP-D8	1.94	Site 6	25-Jan-22	0.0	0.3	22.3	77.4
GP-D8	2.10	Site 6	28-Sep-22	0.0	1.2	20.3	78.5
GP-D8	1.82	Site 6	20-Mar-23	0.0	0.4	21.0	78.6
GP-D8	2.05	Site 6	29-Aug-23	0.0	1.4	19.9	78.7
GP-D8	1.89	Site 6	22-Feb-24	0.0	0.0	21.1	78.9
GP-D8	2.07	Site 6	19-Sep-24	0.0	1.5	19.4	79.0
GP-D13	0.37	Site 6	03-Dec-12	**20.4**	7.4	15.7	56.5
GP-D13	0.39	Site 6	18-Dec-12	**20.8**	7.2	15.7	56.3
GP-D13	0.26	Site 6	04-Apr-13	**5.1**	1.4	19.5	74.4
GP-D13	0.42	Site 6	20-Jun-13	**24.0**	5.6	14.1	57.4
GP-D13	0.68	Site 6	22-Aug-13	**16.8**	5.9	16.1	58.2
GP-D13	0.43	Site 6	11-Oct-13	**20.6**	8.3	15.2	53.6
GP-D13	0.44	Site 6	13-Dec-13	**42.5**	12.7	15.8	29.0
GP-D13	0.45	Site 6	12-Feb-14	**28.5**	7.9	14.9	48.7
GP-D13	0.35	Site 6	27-Nov-14	**15.0**	4.7	17.8	62.5
GP-D13	0.35	Site 6	11-Mar-15	**27.6**	6.6	14.6	51.2
GP-D13	0.62	Site 6	21-Sep-15	**20.2**	8.5	16.6	54.7
GP-D13	0.30	Site 6	14-Dec-15	**46.8**	14.7	7.5	31.0
GP-D13	0.16	Site 6	14-Mar-16	**26.7**	6.6	14.8	51.9
GP-D13	0.70	Site 6	06-Sep-16	**29.3**	9.9	11.5	49.2
GP-D13	0.18	Site 6	28-Feb-17	**12.0**	3.0	18.7	66.3
GP-D13	0.54	Site 6	08-Sep-17	**41.6**	13.2	8.1	35.1
GP-D13	0.10	Site 6	23-Feb-18	0.0	0.1	22.0	77.9
GP-D13	0.59	Site 6	04-Sep-18	**35.2**	9.1	11.2	44.5
GP-D13	0.53	Site 6	01-Apr-19	0.0	0.0	20.8	79.2
GP-D13	0.72	Site 6	29-Aug-19	**15.2**	3.7	16.4	64.7
GP-D13	0.43	Site 6	14-Feb-20	**14.6**	2.8	13.2	69.4
GP-D13	0.35	Site 6	03-Feb-21	**10.0**	1.9	19.6	68.5
GP-D13	not measured	Site 6	17-Sep-21	**10.3**	2.4	19.0	68.3
GP-D13	0.34	Site 6	06-Oct-21	**22.2**	10.7	9.3	57.8
GP-D13	0.41	Site 6	25-Jan-22	4.8	1.2	21.1	72.9
GP-D13	0.59	Site 6	28-Sep-22	**8.4**	2.5	19.7	69.4
GP-D13	0.30	Site 6	20-Mar-23	**5.3**	1.3	20.9	72.5
GP-D13	0.59	Site 6	29-Aug-23	**15.0**	2.9	16.9	65.2
GP-D13	0.30	Site 6	22-Feb-24	**69.8**	8.9	4.4	16.9
GP-D13	0.37	Site 6	29-Mar-24	**7.0**	1.5	20.1	71.4
GP-D13	0.66	Site 6	19-Sep-24	**15.8**	3.9	16.9	63.4

Table 6
Landfill Gas Concentrations (% methane by volume)
Dyment's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	**Water** (mbgs)	**Site**	**Sample Date**	**CH4 (%)**	**CO2 (%)**	**O2 (%)**	**Bal. (%)**
GP-D14		Site 6	15-Jun-12	0.5	-	-	-
GP-D14		Site 6	15-Jun-12	3.4	-	-	-
GP-D14		Site 6	28-Jun-12	0.2	0.0	18.5	81.3
GP-D14	1.70	Site 6	17-Sep-12	No Reading Taken			
GP-D14		Site 6	18-Oct-12	0.0	0.0	21.3	78.7
GP-D14	1.49	Site 6	03-Dec-12	0.0	0.1	21.3	78.6
GP-D14	1.53	Site 6	18-Dec-12	0.0	0.1	21.2	78.7
GP-D14	1.32	Site 6	04-Apr-13	0.0	0.0	21.0	79.0
GP-D14	1.66	Site 6	20-Jun-13	0.2	0.3	19.4	80.1
GP-D14	1.75	Site 6	22-Aug-13	0.1	0.2	20.8	78.9
GP-D14	1.62	Site 6	11-Oct-13	0.1	0.0	21.4	78.5
GP-D14	1.62	Site 6	13-Dec-13	0.0	1.7	22.1	76.2
GP-D14	1.65	Site 6	12-Feb-14	0.0	0.6	20.8	78.6
GP-D14	1.36	Site 6	27-Nov-14	0.2	0.6	21.6	77.6
GP-D14	1.36	Site 6	11-Mar-15	0.0	1.6	20.9	77.5
GP-D14	1.75	Site 6	21-Sep-15	0.0	4.8	17.2	78.0
GP-D14	1.63	Site 6	14-Dec-15	0.4	2.0	18.7	78.9
GP-D14	1.11	Site 6	14-Mar-16	1.2	0.6	22.3	76.9
GP-D14	1.77	Site 6	06-Sep-16	**6.9**	15.7	5.3	72.1
GP-D14	1.64	Site 6	25-Nov-16	0.5	0.3	20.2	79.0
GP-D14	1.30	Site 6	27-Feb-17	1.6	1.0	21.3	76.1
GP-D14	1.69	Site 6	08-Sep-17	3.3	10.4	11.3	75.0
GP-D14	1.16	Site 6	23-Feb-18	0.1	0.1	21.8	78.0
GP-D14	1.70	Site 6	04-Sep-18	1.3	7.5	12.6	78.6
GP-D14	1.55	Site 6	01-Apr-19	0.2	0.3	20.1	79.4
GP-D14	1.74	Site 6	29-Aug-19	0.0	5.4	15.4	79.2
GP-D14	1.56	Site 6	14-Feb-20	0.1	0.1	19.7	80.1
GP-D14	1.71	Site 6	11-Sep-20	0.3	4.9	16.9	77.9
GP-D14	1.59	Site 6	03-Feb-21	0.8	3.4	18.7	77.1
GP-D14	1.41	Site 6	17-Sep-21	0.2	5.6	14.5	79.7
GP-D14	1.70	Site 6	25-Jan-22	0.0	0.4	21.5	78.1
GP-D14	1.69	Site 6	28-Sep-22	0.0	4.5	17.8	77.7
GP-D14	1,52	Site 6	20-Mar-23	0.0	0.1	22.0	77.9
GP-D14	1.78	Site 6	29-Aug-23	0.2	0.4	20.5	78.9
GP-D14	1.60	Site 6	22-Feb-24	0.0	0.0	21.1	78.9
GP-D14	1.77	Site 6	19-Sep-24	0.0	4.4	17.3	78.3
GP-D15	1.98	Site 5	03-Dec-12	0.0	1.6	19.8	78.6
GP-D15	1.99	Site 5	18-Dec-12	0.0	1.9	19.8	78.3
GP-D15	1.89	Site 5	04-Apr-13	0.0	1.2	19.8	79.0
GP-D15	1.99	Site 5	20-Jun-13	0.0	1.1	19.7	79.1
GP-D15	2.15	Site 5	22-Aug-13	0.1	3.4	18.0	78.4
GP-D15	2.07	Site 5	11-Oct-13	0.1	0.6	20.9	78.4
GP-D15	2.00	Site 5	13-Dec-13	0.0	2.6	22.0	75.4
GP-D15	2.10	Site 5	12-Feb-14	0.0	1.9	21.9	76.2
GP-D15	1.87	Site 5	27-Nov-14	0.0	2.2	19.7	78.1
GP-D15	1.87	Site 5	11-Mar-15	0.0	1.5	21.3	77.2
GP-D15	2.17	Site 5	21-Sep-15	0.0	4.4	18.0	77.6
GP-D15	1.92	Site 5	14-Dec-15	0.0	2.2	18.9	78.9
GP-D15	1.79	Site 5	27-Feb-17	0.0	1.0	21.1	77.9
GP-D15	1.97	Site 5	08-Sep-17	0.0	2.9	18.5	78.6
GP-D15	1.90	Site 5	23-Feb-18	0.0	0.1	22.0	77.9
GP-D15	2.01	Site 5	04-Sep-18	0.0	3.9	17.1	79.0
GP-D15	1.86	Site 5	01-Apr-19	0.0	0.2	20.4	79.4
GP-D15	2.01	Site 5	29-Aug-19	0.0	3.2	17.0	79.8
GP-D15	1.88	Site 5	14-Feb-20	0.0	0.0	20.8	79.2
GP-D15	2.14	Site 5	03-Feb-21	0.0	1.5	20.4	78.1
GP-D15	2.14	Site 5	17-Sep-21	0.0	4.0	16.8	79.2
GP-D15	2.14	Site 5	25-Jan-22	0.0	0.3	20.0	79.7
GP-D15	2.14	Site 5	28-Sep-22	0.0	4.4	17.3	78.3
GP-D15	2.14	Site 5	24-Feb-23	0.0	0.8	20.7	78.5
GP-D15	2.14	Site 5	29-Aug-23	0.0	3.9	17.8	78.3
GP-D15	2.14	Site 5	22-Feb-24	0.0	0.0	20.9	79.1
GP-D15	2.14	Site 5	24-Sep-24	0.3	3.1	18.2	78.4

Table 6
Landfill Gas Concentrations (% methane by volume)
Dyment's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	**Water** (mbgs)	**Site**	**Sample Date**	**CH4 (%)**	**CO2 (%)**	**O2 (%)**	**Bal. (%)**
GP-D16	2.70	Site 5	28-Jun-12	0.0	0.2	18.4	81.4
GP-D16	2.40	Site 5	17-Sep-12	No Reading Taken			
GP-D16	2.70	Site 5	18-Oct-12	0.0	2.8	18.2	79.0
GP-D16	2.34	Site 5	03-Dec-12	0.0	2.5	19.1	78.4
GP-D16	2.33	Site 5	18-Dec-12	0.0	2.3	19.1	78.6
GP-D16	2.18	Site 5	04-Apr-13	0.0	2.7	16.9	80.4
GP-D16	2.19	Site 5	20-Jun-13	0.0	2.7	15.6	81.7
GP-D16	2.39	Site 5	22-Aug-13	0.1	2.2	19.1	78.6
GP-D16	2.38	Site 5	11-Oct-13	0.1	1.7	19.7	78.5
GP-D16	2.33	Site 5	13-Dec-13	0.0	2.9	21.8	75.3
GP-D16	2.45	Site 5	12-Feb-14	0.0	3.9	16.1	80.0
GP-D16	2.31	Site 5	27-Nov-14	0.0	3.4	19.1	77.5
GP-D16	1.87	Site 5	11-Mar-15	0.0	2.2	18.7	79.1
GP-D16	2.43	Site 5	21-Sep-15	0.0	2.9	18.4	78.7
GP-D16	2.41	Site 5	14-Dec-15	0.0	2.1	18.9	79.0
GP-D16	2.05	Site 5	27-Feb-17	0.0	1.4	20.6	78.0
GP-D16	2.24	Site 5	08-Sep-17	0.0	1.6	19.7	78.7
GP-D16	2.28	Site 5	23-Feb-18	0.0	0.0	22.1	77.9
GP-D16	2.40	Site 5	04-Sep-18	0.0	2.2	17.2	80.6
GP-D16	2.30	Site 5	01-Apr-19	0.0	0.0	20.7	79.3
GP-D16	2.41	Site 5	29-Aug-19	0.0	1.2	18.7	80.1
GP-D16	2.27	Site 5	14-Feb-20	0.0	0.1	20.6	79.3
GP-D16	2.31	Site 5	03-Feb-21	0.0	1.5	19.3	79.2
GP-D16	2.24	Site 5	17-Sep-21	0.0	1.7	19.9	78.4
GP-D16	2.26	Site 5	25-Jan-22	0.0	0.9	20.7	78.4
GP-D16	2.43	Site 5	28-Sep-22	0.0	1.9	19.7	78.4
GP-D16	2.15	Site 5	20-Mar-23	0.0	1.6	19.2	79.2
GP-D16	2.25	Site 5	30-Aug-23	0.0	2.3	19.5	78.2
GP-D16	2.17	Site 5	22-Feb-24	0.0	0.0	20.8	79.2
GP-D16	2.26	Site 5	19-Sep-24	0.0	1.3	19.7	79.0
GP-D17	2.08	Site 5	03-Dec-12	0.0	0.5	20.8	78.7
GP-D17	2.08	Site 5	19-Dec-12	0.0	0.5	20.6	78.9
GP-D17	1.97	Site 5	04-Apr-13	0.0	0.1	20.1	79.8
GP-D17	1.83	Site 5	20-Jun-13	0.0	1.1	15.8	83.1
GP-D17	2.21	Site 5	22-Aug-13	0.1	1.6	19.1	79.2
GP-D17	2.12	Site 5	11-Oct-13	0.1	0.8	20.7	78.4
GP-D17	2.04	Site 5	13-Dec-13	0.0	0.7	22.3	77.0
GP-D17	2.16	Site 5	25-Feb-14	0.0	0.7	21.4	77.9
GP-D17	2.04	Site 5	27-Nov-14	0.0	0.8	21.2	78.0
GP-D17	2.04	Site 5	12-Mar-15	0.0	0.7	22.0	77.3
GP-D17	2.23	Site 5	21-Sep-15	0.0	1.2	20.1	78.7
GP-D17	2.08	Site 5	14-Dec-15	0.0	0.5	20.3	79.2
GP-D17	1.81	Site 5	20-Mar-17	0.0	0.4	20.9	78.7
GP-D17	2.15	Site 5	08-Sep-17	0.0	1.1	19.9	79.0
GP-D17	2.05	Site 5	23-Feb-18	0.0	0.0	22.3	77.7
GP-D17	2.26	Site 5	04-Sep-18	0.0	1.4	18.8	79.8
GP-D17	2.00	Site 5	01-Apr-19	0.0	0.0	20.9	79.1
GP-D17	2.30	Site 5	29-Aug-19	0.0	1.3	16.8	81.9
GP-D17	2.04	Site 5	14-Feb-20	0.0	0.0	20.4	79.6
GP-D17	2.21	Site 5	11-Sep-20	0.0	1.0	19.5	79.5
GP-D17	2.21	Site 5	03-Mar-21	0.0	0.0	21.4	78.6
GP-D17	2.15	Site 5	17-Sep-21	0.0	1.2	19.6	79.2
GP-D17	2.12	Site 5	17-Feb-22	0.0	0.0	22.3	77.7
GP-D17	2.17	Site 5	28-Sep-22	0.0	1.1	20.9	78.0
GP-D17	2.05	Site 5	24-Feb-23	0.0	0.3	21.1	78.6
GP-D17	2.32	Site 5	29-Aug-23	0.0	1.2	19.2	79.6
GP-D17	2.22	Site 5	22-Feb-24	0.0	0.0	21.2	78.8
GP-D17	2.10	Site 5	19-Sep-24	0.2	0.0	20.2	79.6

Table 6
Landfill Gas Concentrations (% methane by volume)
Dyment's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	**Water** (mbgs)	**Site**	**Sample Date**	**CH4 (%)**	**CO2 (%)**	**O2 (%)**	**Bal. (%)**
GP-D19	2.74	Site 5	15-Jun-12	0.0	-	-	-
GP-D19	2.74	Site 5	28-Jun-12	0.0	0.0	18.8	81.2
GP-D19	2.74	Site 5	18-Oct-12	0.0	1.8	19.2	79.0
GP-D19	2.74	Site 5	03-Dec-12	0.0	1.4	20.0	78.6
GP-D19	2.74	Site 5	18-Dec-12	0.0	1.3	19.8	78.9
GP-D19	2.74	Site 5	04-Apr-13	0.0	2.6	14.0	83.4
GP-D19	2.74	Site 5	20-Jun-13	0.0	1.7	16.3	82.0
GP-D19	2.74	Site 5	22-Aug-13	0.1	1.4	19.7	78.8
GP-D19	2.74	Site 5	11-Oct-13	0.0	1.2	26.3	78.5
GP-D19	2.74	Site 5	13-Dec-13	0.0	1.3	20.1	78.6
GP-D19	2.37	Site 5	12-Feb-14	0.0	2.5	19.8	77.7
GP-D19	2.25	Site 5	27-Nov-14	0.0	2.0	20.3	77.7
GP-D19	2.25	Site 5	11-Mar-15	0.0	1.9	20.5	77.6
GP-D19	2.74	Site 5	21-Sep-15	0.0	2.3	19.5	78.2
GP-D19	2.74	Site 5	14-Dec-15	0.1	1.4	19.8	78.7
GP-D19	2.74	Site 5	28-Feb-17	0.0	1.1	21.3	77.6
GP-D19	2.74	Site 5	08-Sep-17	0.0	1.3	20.0	78.7
GP-D19	2.74	Site 5	23-Feb-18	0.0	0.1	22.0	77.9
GP-D19	2.74	Site 5	04-Sep-18	0.0	2.3	18.6	79.1
GP-D19	2.74	Site 5	01-Apr-19	0.1	0.3	20.2	79.4
GP-D19	2.74	Site 5	29-Aug-19	0.0	1.3	18.0	80.7
GP-D19	2.74	Site 5	14-Feb-20	0.0	0.1	20.7	79.2
GP-D19	2.75	Site 5	11-Sep-20	0.0	2.0	19.9	78.1
GP-D19	2.74	Site 5	03-Feb-21	0.0	0.9	19.9	79.2
GP-D19	2.74	Site 5	17-Sep-21	0.0	1.7	19.9	78.4
GP-D19	2.74	Site 5	25-Jan-22	0.0	0.7	21.8	77.5
GP-D19	2.74	Site 5	28-Sep-22	0.0	1.6	20.6	77.8
GP-D19	2.74	Site 5	24-Feb-23	0.0	0.9	21.6	77.5
GP-D19	2.74	Site 5	30-Aug-23	0.0	1.4	20.3	78.3
GP-D19	2.74	Site 5	22-Feb-24	0.0	0.0	21.0	79.0
GP-D19	2.74	Site 5	19-Sep-24	0.0	1.0	19.5	79.5
GP-D20	3.57	Site 6	22-Aug-13	0.0	1.9	19.0	79.1
GP-D20	3.51	Site 6	11-Oct-13	0.0	1.6	19.4	79.0
GP-D20	3.46	Site 6	13-Dec-13	0.0	0.2	21.7	78.1
GP-D20	3.58	Site 6	12-Feb-14	0.0	0.8	22.5	76.7
GP-D20	3.45	Site 6	27-Nov-14	0.0	0.9	20.9	78.2
GP-D20	3.45	Site 6	12-Mar-15	0.0	0.4	22.8	76.8
GP-D20	3.60	Site 6	21-Sep-15	0.0	1.9	20.1	78.0
GP-D20	3.46	Site 6	14-Dec-15	0.1	0.9	19.9	79.1
GP-D20	3.22	Site 6	27-Feb-17	0.0	0.4	20.4	79.2
GP-D20	3.49	Site 6	08-Sep-17	0.0	1.3	19.7	79.0
GP-D20	3.36	Site 6	23-Feb-18	0.0	0.6	21.2	78.2
GP-D20	3.51	Site 6	04-Sep-18	0.0	1.4	18.7	79.9
GP-D20	3.35	Site 6	01-Apr-19	0.0	0.0	20.8	79.2
GP-D20	3.64	Site 6	29-Aug-19	0.0	1.1	18.6	80.3
GP-D20	3.33	Site 6	14-Feb-20	0.0	0.0	20.6	79.4
GP-D20	3.52	Site 6	11-Sep-20	0.0	1.4	19.9	78.7
GP-D20	3.45	Site 6	03-Feb-21	0.0	0.6	20.4	79.0
GP-D20	3.45	Site 6	17-Sep-21	0.0	1.5	19.3	79.2
GP-D20	3.32	Site 6	25-Jan-22	0.0	0.7	21.1	78.2
GP-D20	3.55	Site 6	28-Sep-22	0.0	1.3	20.4	78.3
GP-D20	3.36	Site 6	20-Mar-23	0.0	0.6	20.2	79.2
GP-D20	3.52	Site 6	29-Aug-23	0.0	1.7	18.9	79.4
GP-D20	3.41	Site 6	22-Feb-24	0.0	0.0	21.4	78.6
GP-D20	3.53	Site 6	19-Sep-24	0.0	1.4	19.8	78.9

Table 6
Landfill Gas Concentrations (% methane by volume)
Dyment's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	**Water** (mbgs)	**Site**	**Sample Date**	**CH4 (%)**	**CO2 (%)**	**O2 (%)**	**Bal. (%)**
GP-D21	3.50	Site 6	22-Aug-13	0.0	0.7	20.2	79.0
GP-D21	3.44	Site 6	11-Oct-13	0.0	0.5	21.1	78.4
GP-D21	3.36	Site 6	13-Dec-13	0.0	0.2	22.2	77.6
GP-D21	3.53	Site 6	12-Feb-14	0.0	0.4	22.8	76.8
GP-D21	3.34	Site 6	27-Nov-14	0.0	0.5	21.6	77.9
GP-D21	3.34	Site 6	12-Mar-15	0.0	0.3	22.8	76.9
GP-D21	3.55	Site 6	21-Sep-15	0.0	0.7	21.1	78.2
GP-D21	3.25	Site 6	14-Dec-15	0.1	0.2	20.7	79.0
GP-D21	3.03	Site 6	27-Feb-17	0.0	0.2	21.1	78.7
GP-D21	3.23	Site 6	23-Feb-18	0.0	0.1	22.1	77.8
GP-D21	3.28	Site 6	01-Apr-19	0.0	0.3	20.0	79.7
GP-D21	3.60	Site 6	29-Aug-19	0.0	0.5	19.1	80.4
GP-D21	3.30	Site 6	14-Feb-20	0.0	0.0	20.8	79.2
GP-D21	2.46	Site 6	11-Sep-20	0.0	0.6	20.5	78.9
GP-D21	3.38	Site 6	03-Feb-21	0.0	0.3	20.8	78.9
GP-D21	3.28	Site 6	17-Sep-21	0.0	0.5	20.9	78.6
GP-D21	3.32	Site 6	25-Jan-22	0.0	0.2	21.5	78.3
GP-D21	3.51	Site 6	28-Sep-22	0.0	0.5	21.1	78.4
GP-D21	3.27	Site 6	20-Mar-23	0.0	0.2	21.4	78.4
GP-D21	3.52	Site 6	29-Aug-23	0.0	0.5	20.1	79.4
GP-D21	3.34	Site 6	22-Feb-24	0.0	0.0	21.3	78.7
GP-D21	3.48	Site 6	19-Sep-24	0.0	0.4	20.2	79.4
GP-D22	4.03	Site 6	22-Aug-13	0.0	0.7	20.0	79.3
GP-D22	3.97	Site 6	11-Oct-13	0.0	0.5	20.8	78.7
GP-D22	3.88	Site 6	13-Dec-13	0.0	0.3	22.8	76.9
GP-D22	4.04	Site 6	25-Feb-14	0.0	0.2	22.2	77.6
GP-D22	3.82	Site 6	25-Nov-14	0.0	0.1	21.9	77.8
GP-D22	3.82	Site 6	12-Mar-15	0.0	0.1	21.1	78.8
GP-D22	4.07	Site 6	21-Sep-15	0.0	0.8	21.1	78.1
GP-D22	3.75	Site 6	14-Dec-15	0.1	0.3	20.7	78.9
GP-D22	3.29	Site 6	27-Feb-17	0.0	0.2	21.3	78.5
GP-D22	3.85	Site 6	08-Sep-17	0.0	0.5	20.7	78.8
GP-D22	3.75	Site 6	23-Feb-18	0.0	0.1	22.0	77.9
GP-D22	3.97	Site 6	04-Sep-18	0.1	0.1	20.3	79.5
GP-D22	3.91	Site 6	01-Apr-19	0.0	0.2	20.7	79.1
GP-D22	4.12	Site 6	29-Aug-19	0.0	0.6	18.9	80.5
GP-D22	3.90	Site 6	14-Feb-20	0.0	0.2	20.4	79.4
GP-D22	3.98	Site 6	11-Sep-20	0.0	0.5	20.7	78.8
GP-D22	3.93	Site 6	03-Mar-21	0.0	0.0	21.3	78.7
GP-D22	3.86	Site 6	17-Sep-21	0.0	0.4	20.5	79.1
GP-D22	3.78	Site 6	17-Feb-22	0.0	0.0	22.2	77.8
GP-D22	3.99	Site 6	28-Sep-22	0.0	0.5	21.0	78.5
GP-D22	3.77	Site 6	24-Feb-23	0.0	0.1	19.8	80.1
GP-D22		Site 6	13-Apr-23	Decommissioned			
GP-D23	2.88	Site 6	22-Aug-13	0.0	4.4	17.1	78.5
GP-D23	2.79	Site 6	11-Oct-13	0.0	0.3	21.2	78.5
GP-D23	2.71	Site 6	13-Dec-13	0.0	0.3	22.7	77.0
GP-D23	2.89	Site 6	25-Feb-14	0.0	2.3	21.2	76.5
GP-D23	2.71	Site 6	25-Nov-14	0.0	2.9	19.6	77.5
GP-D23	2.71	Site 6	16-Mar-15	0.1	2.3	20.6	77.0
GP-D23	2.90	Site 6	21-Sep-15	0.0	3.7	18.4	77.9
GP-D23	3.62	Site 6	14-Dec-15	0.0	2.7	18.5	78.8
GP-D23	2.59	Site 6	27-Feb-17	0.0	0.6	21.0	78.4
GP-D23	2.72	Site 6	08-Sep-17	0.0	4.5	17.3	78.2
GP-D23	2.56	Site 6	23-Feb-18	0.0	0.1	22.2	77.7
GP-D23	3.02	Site 6	04-Sep-18	0.0	0.4	20.0	79.6
GP-D23	2.92	Site 6	01-Apr-19	0.0	0.1	20.4	79.5
GP-D23	2.96	Site 6	29-Aug-19	0.0	4.4	15.7	79.9
GP-D23	3.93	Site 6	14-Feb-20	0.0	0.0	20.9	79.1
GP-D23	2.93	Site 6	03-Mar-21	0.0	0.0	20.9	79.1
GP-D23	2.68	Site 6	17-Sep-21	0.0	4.2	16.6	79.2
GP-D23	2.75	Site 6	24-Feb-22	0.0	0.6	22.1	77.3
GP-D23	3.01	Site 6	28-Sep-22	0.0	4.8	16.7	78.5
GP-D23	2.70	Site 6	24-Feb-23	0.0	0.3	22.0	77.7

Table 6
Landfill Gas Concentrations (% methane by volume)
Dyment's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	**Water** (mbgs)	**Site**	**Sample Date**	**CH4 (%)**	**CO2 (%)**	**O2 (%)**	**Bal. (%)**
GP-D23R	3.06	Site 6	22-Dec-23	0.0	0.2	20.1	79.7
GP-D23R	2.99	Site 6	22-Feb-24	0.0	0.0	21.1	78.9
GP-D23R	3.14	Site 6	19-Sep-24	0.0	0.2	20.3	79.1
GP-D24	5.14	Site 6	22-Aug-13	0.0	1.0	20.0	79.0
GP-D24	4.07	Site 6	11-Oct-13	0.1	0.5	21.0	78.4
GP-D24	3.98	Site 6	13-Dec-13	0.0	0.3	22.8	76.9
GP-D24		Site 6	12-Feb-14	Well Buried- No Reading Taken			
GP-D24	4.01	Site 6	03-Apr-14	0.0	0.6	21.4	78.0
GP-D24	3.99	Site 6	25-Nov-14	0.0	1.0	21.4	77.7
GP-D24	3.99	Site 6	12-Mar-15	Well Buried- No Reading Taken			
GP-D24	4.18	Site 6	21-Sep-15	0.0	1.3	20.6	78.1
GP-D24	3.28	Site 6	14-Dec-15	0.0	0.6	20.3	79.1
GP-D24	3.76	Site 6	27-Feb-17	0.0	0.4	21.3	78.3
GP-D24	3.90	Site 6	08-Sep-17	0.2	1.2	20.2	78.4
GP-D24	3.87	Site 6	23-Feb-18	0.0	0.1	22.2	77.7
GP-D24	4.13	Site 6	04-Sep-18	0.0	0.9	19.6	79.5
GP-D24	4.11	Site 6	01-Apr-19	0.0	0.0	20.8	79.2
GP-D24	4.22	Site 6	30-Aug-19	0.0	1.2	19.0	79.8
GP-D24	4.12	Site 6	14-Feb-20	0.0	0.0	20.1	79.9
GP-D24	4.09	Site 6	11-Sep-20	0.0	1.0	20.5	78.5
GP-D24	4.04	Site 6	03-Mar-21	0.0	0.0	21.3	78.7
GP-D24	3.99	Site 6	17-Sep-21	0.0	0.9	20.2	78.9
GP-D24	3.92	Site 6	24-Feb-22	0.0	0.1	20.9	79.0
GP-D24	4.03	Site 6	28-Sep-22	0.0	1.1	20.5	78.4
GP-D24	3.87	Site 6	24-Feb-23	0.0	0.0	22.2	77.8
GP-D24	3.87	Site 6	24-Feb-23	0.0	0.0	22.2	77.8
GP-D24		Site 6	13-Apr-23	Decommissioned			
GP-D26	2.81	Site 4	22-Aug-13	0.1	1.0	19.8	79.1
GP-D26	2.77	Site 4	11-Oct-13	0.1	0.6	20.9	78.4
GP-D26	2.67	Site 4	13-Dec-13	0.0	0.4	22.7	76.9
GP-D26	2.80	Site 4	25-Feb-14	0.0	0.5	21.8	77.7
GP-D26	2.68	Site 4	27-Nov-14	0.0	0.6	21.2	78.2
GP-D26	2.68	Site 4	12-Mar-15	0.0	0.3	22.5	77.2
GP-D26	2.88	Site 4	22-Sep-15	0.0	1.2	21.0	77.8
GP-D26	2.72	Site 4	14-Dec-15	0.0	0.3	20.4	79.3
GP-D26	2.41	Site 4	28-Feb-17	0.0	0.2	21.6	78.2
GP-D26	2.79	Site 4	08-Sep-17	0.0	0.8	20.1	79.1
GP-D26	2.70	Site 4	23-Feb-18	0.0	0.3	21.9	77.8
GP-D26	2.90	Site 4	04-Sep-18	0.0	1.0	19.3	79.7
GP-D26	2.82	Site 4	01-Apr-19	0.0	0.2	20.6	79.2
GP-D26	2.95	Site 4	29-Aug-19	0.0	0.8	19.4	79.8
GP-D26	2.80	Site 4	14-Feb-20	0.0	0.0	20.7	79.3
GP-D26	2.86	Site 4	03-Mar-21	0.0	0.0	21.4	78.6
GP-D26	2.79	Site 4	17-Sep-21	0.0	1.1	19.4	79.5
GP-D26	2.77	Site 4	17-Feb-22	0.0	0.3	21.6	78.1
GP-D26	2.85	Site 4	28-Sep-22	0.0	1.0	20.9	78.1
GP-D26	2.69	Site 4	24-Feb-23	0.0	0.1	21.7	78.2
GP-D26	2.95	Site 4	29-Aug-23	0.0	0.9	19.7	79.4
GP-D26	2.69	Site 4	22-Feb-24	0.0	0.0	21.3	78.7
GP-D26	2.84	Site 4	19-Sep-24	0.0	0.5	20.2	79.2

Table 6
Landfill Gas Concentrations (% methane by volume)
Dyment's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	**Water** (mbgs)	**Site**	**Sample Date**	**CH4 (%)**	**CO2 (%)**	**O2 (%)**	**Bal. (%)**
GP-D27	2.53	Site 4	22-Aug-13	0.1	4.2	15.3	80.4
GP-D27	2.58	Site 4	11-Oct-13	0.1	1.9	18.7	79.3
GP-D27	2.53	Site 4	13-Dec-13	0.0	3.5	18.1	78.4
GP-D27	2.71	Site 4	25-Feb-14	0.0	2.5	18.3	79.2
GP-D27	2.58	Site 4	25-Nov-14	0.0	5.9	13.7	80.4
GP-D27	2.58	Site 4	12-Mar-15	0.0	3.9	17.2	78.9
GP-D27	2.66	Site 4	21-Sep-15	0.0	6.1	13.3	80.6
GP-D27	2.62	Site 4	14-Dec-15	0.0	1.7	18.1	80.2
GP-D27	2.29	Site 4	28-Feb-17	0.0	3.7	15.3	81.0
GP-D27	2.44	Site 4	08-Sep-17	0.0	3.5	16.4	80.1
GP-D27	2.46	Site 4	23-Feb-18	0.0	0.0	22.4	77.6
GP-D27	2.63	Site 4	04-Sep-18	0.0	4.3	15.1	80.6
GP-D27	2.58	Site 4	01-Apr-19	0.0	0.0	20.8	79.2
GP-D27	2.63	Site 4	29-Aug-19	0.0	4.8	14.1	81.1
GP-D27	2.60	Site 4	14-Feb-20	0.0	0.2	20.5	79.2
GP-D27	2.48	Site 4	03-Mar-21	0.0	0.9	19.3	79.8
GP-D27	2.46	Site 4	17-Sep-21	0.0	6.1	13.1	80.8
GP-D27	2.48	Site 4	17-Feb-22	0.0	1.5	20.5	78.0
GP-D27	2.63	Site 4	28-Sep-22	0.0	5.0	15.2	79.8
GP-D27	2.36	Site 4	24-Feb-23	0.0	0.1	22.1	77.8
GP-D27	2.41	Site 4	29-Aug-23	0.0	3.2	16.0	80.2
GP-D27	2.31	Site 4	22-Feb-24	0.0	0.0	21.4	78.6
GP-D27	2.35	Site 4	19-Sep-24	0.2	0.0	20.7	79.1
GVP-1	na	Site 6	23-Mar-23	0.0	0.7	19.7	79.6
GVP-1	na	Site 6	29-Aug-23	0.0	3.4	17.3	79.3
GVP-1	na	Site 6	29-Mar-24	0.3	0.7	20.4	78.6
GVP-1	na	Site 6	13-Sep-24	0.0	4.5	16.0	79.6
GVP-1	na	Site 6	19-Sep-24	0.0	5.2	15.6	79.2
GVP-2	na	Site 6	23-Mar-23	0.1	0.1	21.3	78.5
GVP-2	na	Site 6	29-Aug-23	0.1	2.9	17.5	79.5
GVP-2	na	Site 6	29-Mar-24	0.3	0.4	21.2	78.1
GVP-2	na	Site 6	13-Sep-24	0.2	6.5	13.8	79.5
GVP-2	na	Site 6	19-Sep-24	0.1	0.1	20.9	78.9
GVP-3	na	Site 6	23-Mar-23	0.1	0.1	21.6	78.2
GVP-3	na	Site 6	29-Aug-23	0.0	1.0	19.2	79.8
GVP-3	na	Site 6	29-Mar-24	0.3	0.1	21.8	77.9
GVP-3	na	Site 6	13-Sep-24	0.0	0.1	20.4	79.5
GVP-3	na	Site 6	19-Sep-24	0.1	2.0	18.8	79.1

Notes:
NM = not measured
bold and shaded indicates a methane concentration above 5%, the lower explosive limit of methane

Table 7
Surface Water Analytical Results
Metals and Inorganics
City of Barrie Historic Waste Dyment's Creek

Monitoring Well Location				SWD1																			
Sampling Date				08-Nov-12	23-Apr-13	23-Aug-13	11-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16		15-Sep-17	07-Sep-18		05-Sep-19	11-Sep-20	10-May-21	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	05-Oct-23	13-Sep-24
Sampling Location				West of Bradford Street																			
Parameter	Units	RDL	PWQO								Field Duplicate of SWD1			Field Duplicate of SWD1									Re-Sampling	
Total Metals																							
Aluminum-dissolved	ug/L	1	75	<4	40	60	7	6	<1	5	<1	<1	<1	<1	<5	5	<5	8	<5	7	9	7	3	4
Aluminum (total)	ug/L	1	NO	-	-	90	-	-	220	-	-	-	-	-	100	50	31	36	29	30	76	48	68	30
Antimony	ug/L	0.9	20	<3	<0.5	0.2	<0.5	<0.5	<0.5	0.8	0.6	<0.5	<0.5	<0.5	<0.50	<0.5	<0.50	<0.50	<0.50	<0.50	< 0.9	< 0.9	< 0.9	<0.9
Arsenic	ug/L	0.2	100	<3	<1	0.4	<1	<1	<1	15	9	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	0.3	0.3	0.4	0.3
Barium	ug/L	0.08	NO	99	120	161	138	112	162	191	200	162	139	136	130	150	130	120	130	140	138	116	225	150
Beryllium	ug/L	0.007	1100	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.40	<0.40	<0.40	<0.40	<0.40	0.007	< 0.007	< 0.007	< 0.007
Total Bismuth (Bi)	ug/L	0.01	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-	< 0.01
Boron	ug/L	2	200	47	30	35	39	53	81	87	81	38	26	27	26	36	41	35	31	31	37	28	38	30
Cadmium	ug/L	0.003	0.2	<0.1	<0.1	0.15	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	<0.090	0.017	0.028	0.061	0.034
Chromium	ug/L	0.08	NO	13	3	2.7	6	<1	<1	1	1	<1	<1	<1	<5	<5	<5	<5	<5.0	<5.0	0.84	0.94	0.99	0.39
Cobalt	ug/L	0.004	0.9	<0.5	0.3	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.5	<0.50	<0.50	<0.50	<0.50	0.222	0.109	0.211	0.125
Copper	ug/L	1.0	5	2	3	**8.6**	1.7	<0.5	<0.5	2.3	2.1	<0.5	1.7	1.9	3.7	2.4	1.4	1.4	1.9	1.5	2.2	2.8	2.4	1.0
Iron	ug/L	7	300	**904**	**1350**	**1140**	**1350**	**740**	**946**	**912**	**928**	**1070**	**795**	**816**	**950**	**990**	**1300**	**780**	**1200**	**980**	**1550**	**867**	**1370**	**907**
Lead	ug/L	0.09	25	1	<1	1.72	0.2	0.5	0.4	<0.1	<0.1	0.4	0.3	0.5	1.3	0.51	<0.50	<0.50	<0.50	<0.50	0.72	0.39	0.91	0.34
Total Lithium (Li)	ug/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	-	-	<5	<5	<5.0	<5.0	<5.0	2	2.3	3.3	2.1
Manganese	ug/L	0.01	NO	101	180	131	221	140	130	126	130	123	123	130	110	87	130	75	170	100	159	80.1	261	77.8
Molybdenum	ug/L	0.40	40	<2	<5	1.5	0.7	0.7	0.9	7.1	<0.5	0.8	0.7	0.7	15	1.9	0.77	1.4	0.79	0.69	1.19	1.08	0.87	0.50
Nickel	ug/L	0.10	25	<3	<5	<10	4	<1	<1	<1	<1	<1	<1	1	<1	1.2	<1.0	<1.0	<1.0	<1.0	0.8	0.8	1.1	0.50
Selenium	ug/L	0.04	100	<4	<1	<1	<1	<1	<1	13	7	<1	<1	<1	<2	<2.0	<2.0	<2.0	<2.0	<2.0	0.15	0.17	0.14	0.11
Total Silicon (Si)	ug/L	20	NO	-	-	-	-	-	-	-	-	-	-	-	-	4200	2700	3800	3400	4000	3180	3860	4920	3540
Silver	ug/L	0.05	1	<0.1	<0.1	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	<0.090	< 0.05	< 0.05	< 0.05	< 0.05
Strontium	ug/L	0.08	NO	639	695	616	659	743	697	812	811	680.000	545	550	540	630	690	610	720	640	620	587	771	537
Total Tellurium (Te)	ug/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<10	<1.0	<1.0	< 0.1	< 0.1	< 0.1	< 0.1
Thallium	ug/L	0.005	0.3	<0.3	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.050	<0.05	<0.050	<0.050	<0.050	<0.050	-	< 0.005	< 0.005	< 0.005
Total Tin (Sn)	ug/L	0.06	NO	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	0.12
Titanium	ug/L	0.1	NO	<2	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	8.4	<5.0	5.5	<5.0	<5.0	5.8	4.78	2.06	4.25	1.3
Tungsten	ug/L	0.2	30	<10	<5	10	<10	<10	<10	**34**	<10	<10	<10	<10	<1	<1.0	<1.0	<1.0	<1.0	<1.0	0.14	0.12	0.13	< 0.2
Uranium	ug/L	0.002	5	<2	1	1.25	0.9	1.1	0.6	0.8	0.8	0.7	0.6	0.6	0.61	0.57	0.83	0.62	0.90	0.65	1.04	0.452	0.696	0.563
Vanadium	ug/L	0.01	6	3	1	0.5	3.9	0.6	<0.5	0.9	0.6	<0.5	0.5	0.5	0.86	0.64	0.64	0.71	0.63	0.81	0.86	0.88	0.85	0.53
Zinc	ug/L	2	30	19	<10	16	7	9	7	7	6	6	7	16	9.8	6	5	<5.0	8.2	<5.0	9	9	8	4
Zirconium	ug/L	2	4	<4	<2	<3	<1	<1	<1	2	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	-	< 2	< 2	< 2
Dissolved Mercury	ug/L	0.01	0.2	<0.1	<0.1	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	-	<0.10	< 0.01	< 0.01	< 0.01	< 0.01
Inorganics																								
Electrical Conductivity	uS/cm	2	NO	1070	1460	1140	1610	1580	1690	1870	1950	1660	1430	1430	1300	1500	1700	1200	2000	1500	1620	1280	2000	1220
pH	No unit	0.05	6.5-8.5	8.29	7.94	7.51	7.62	7.57	7.69	7.73	7.71	7.46	7.47	7.54	7.97	8.10	8.23	8.14	8.12	8.02	8.16	7.94	8.12	8.16
Total Hardness (as CaCO3)	mg/L as CaCO3	0.05	NO	301	337	279	420	301	315	309	311	344	298	300	300	290	330	290	340	310	319	247	355	264
Alkalinity (as CaCO3)	mg/L as CaCO3	2	NO	264	276	216	318	282	254	238	235	259	238	249	210	260	280	240	270	230	279	199	273	221
Chloride	mg/L	0.04	NO	211	277	264	303	297	375	416	441	397	275	302	260	270	340	240	470	300	410	380	470	320
Sulphate	mg/L	0.04	NO	31.7	27	30	30	30	30	45.8	44.3	25.5	28.1	26.4	23	24	29	20	31	21	32	17	23	2
Phosphorus (total)	mg/L	0.003	0.030*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.044**	**0.053**	**0.036**
Ammonia as N	as N mg/L	0.10	NO	-	0.60	0.18	0.86	0.45	0.48	0.42	0.42	0.40	0.42	0.45	0.28	0.50	0.59	0.42	0.56	0.46	0.60	0.30	0.60	0.30
Unionized Ammonia (calculated)	mg/L as N	0.005	0.02	-	0.002	0.002	0.001	0.011	0.018	0.009	0.009	0.002	0.006	0.007	0.006	0.016	0.014	0.019	0.006	0.008	0.004	0.006	0.008	0.005
Calcium	ug/L	10	NO	103000	117000	99300	145000	105000	107000	103000	103000	119000	101000	101000	-	110000	110000	96000	120000	110000	111000	84300	116000	88500
Magnesium	ug/L	1	NO	10700	11000	11200	13600	9280	11400	12300	13000	11300	10900	11400	-	10000	11000	8400	10000	9800	9890	8760	15700	10400
Sodium	ug/L	10	NO	114000	185000	153000	240000	187000	213000	250000	247000	222000	156000	159000	-	180000	210000	130000	290000	200000	219000	163000	295000	145000
Potassium	ug/L	9	NO	3460	3000	3400.00	4430	3380	3500.00	4720	4790	3170	3140	3170	-	3000	3000	2700	3100	2800	2980	3180	3800	2660

Notes:

1. NO = No objective
2. mg/L = Milligrams per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994 (* = interim guideline only)
5. Bold type and shaded indicates an exceedance of the PWQO

Table 7
Surface Water Analytical Results
Metals and Inorganics
City of Barrie Historic Waste Dyment's Creek

Monitoring Well Location				SWD2																						
Sampling Date				08-Nov-12	23-Apr-13		23-Aug-13	11-Dec-13	26-Nov-14	24-Sep-15		07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	10-May-21	17-Sep-21	11-Apr-22	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	05-Oct-23	13-Sep-24
Sampling Location				West of Innisfil Street																						
Parameter	**Units**	**RDL**	**PWQO**			**Field Duplicate of SWD2**					**Field Duplicate of SWD2**							**Field Duplicate of SWD2**			**Field Duplicate of SWD2**				**Re-Sampling**	
Total Metals																										
Aluminum-dissolved	ug/L	1	75	<4	40	40	50	5	8	<1	<1	<1	<1	4	<5	6	<5	8	8	5	5	7	9	9	3	5
Aluminum (total)	ug/L	1	NO	-	-	-	70	-	-	350	383	-	-	-	67	47	21	24	36	36	34	70	212	50	59	24
Antimony	ug/L	0.9	20	<3	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.50	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.9	< 0.9	< 0.9	<0.9
Arsenic	ug/L	0.2	100	<3	<1	<1	0.4	<1	<1	<1	<1	7	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.4	0.3	0.5	0.3
Barium	ug/L	0.08	NO	100.000	120.000	120.000	156	137	110.000	157.000	156.000	187	161	145	130	150	130	130	120	130	130	140	130	115	224	143
Beryllium	ug/L	0.007	1100	<1	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.012	< 0.007	< 0.007	< 0.007
Total Bismuth (Bi)	ug/L	0.01	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	< 0.01
Boron	ug/L	2	200	42	30	30	33	40	54	104	110	82	36	27	25	36	41	44	36	31	30	31	33	29	37	29
Cadmium	ug/L	0.003	0.2	<0.1	<0.1	<0.1	0.18	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	0.05	0.011	0.030	0.008
Chromium	ug/L	0.08	NO	9	3	3	2.5	6	2	<1	<1	<1	<1	<1	<5	<5	<5	<5	<0.50	<5.0	<5.0	<5.0	1.16	0.79	1.01	0.39
Cobalt	ug/L	0.004	0.9	<0.5	0.3	0.3	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.289	0.118	0.191	0.102
Copper	ug/L	1.0	5	<2	3	3	**11**	2.4	<0.5	<0.5	<0.5	2.9	<0.5	3.1	2.6	1.7	1.3	1.3	1.2	1.9	2.1	2.0	4.2	2.8	2.3	1.0
Iron	ug/L	7	300	**784**	**1600**	**1520**	**1020**	**1490**	**759**	**792**	**836**	**894**	**928**	**1220**	**780**	**1100**	**1200**	**1200**	**690**	**1100**	**1100**	**1100**	**1870**	**864**	**1400**	**893**
Lead	ug/L	0.09	25	1	<1	<1	3.55	0.5	0.5	0.5	1.7	<0.1	0.3	1.4	0.65	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.82	2.06	0.31	0.77	0.22
Total Lithium (Li)	ug/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	-	-	<5	<5	<5	<5.0	<5.0	<5.0	<5.0	2	2.5	3.4	2.3
Manganese	ug/L	0.01	NO	89	170	170	115	232	134	96	99	102	92	182	89	81	140	140	61	150	150	100	391	68.2	258	70.1
Molybdenum	ug/L	0.40	40	<2	<5	<5.0	1.5	0.7	0.9	0.9	0.8	<0.5	0.8	0.6	0.7	3.6	0.59	0.62	0.74	0.74	0.71	0.62	0.83	1.06	0.84	0.50
Nickel	ug/L	0.10	25	<3	<5	<5.0	<10	4	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	0.9	0.8	1.1	0.50
Selenium	ug/L	0.04	100	<4	<1	<1.0	<1	<1	<1	<1	<1	4	<1	<1	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	0.14	0.20	0.18	0.10
Total Silicon (Si)	ug/L	20	NO	-	-	-	-	-	-	-	-	-	-	-	-	4000	2800	2800	3900	3400	3400	3800	3630	3880	4660	3400
Silver	ug/L	0.05	1	<0.1	<0.1	<0.1	0.03	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	< 0.05	< 0.05	< 0.05	< 0.05
Strontium	ug/L	0.08	NO	623	721	740	596	679	780.000	714.000	703.000	863.000	677.000	539.000	560.000	640	740	760	630	760	760	650	574	610	774	579
Total Tellurium (Te)	ug/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<1.0	< 0.1	< 0.1	< 0.1	< 0.1
Thallium	ug/L	0.005	0.3	<0.3	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.050	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	-	< 0.005	< 0.005	< 0.005
Total Tin (Sn)	ug/L	0.06	NO	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	0.23
Titanium	ug/L	0.1	NO	<2	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	5.9	<5.0	<5.0	<5.0	<5.0	<5.0	6.3	7.8	11.7	2.05	3.18	1.0
Tungsten	ug/L	0.2	30	<10	<5	<5	20.000	<10	<10	<10	<10	<10	<10	<10	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.16	0.13	0.20	< 0.2
Uranium	ug/L	0.002	5	<2	1	1	0.8	0.9	1.2	0.7	0.7	0.8	0.7	0.6	0.62	0.54	0.82	0.81	0.61	0.95	0.94	0.67	0.982	0.491	0.778	0.621
Vanadium	ug/L	0.01	6	4	1	1	0.4	3.8	0.8	<0.5	<0.5	0.6	<0.5	0.9	0.79	0.82	0.61	0.64	0.78	0.70	0.69	0.85	1.18	0.93	0.87	0.59
Zinc	ug/L	2	30	16	<10	<10	14	7	8	10.000	11	9	<5	13	6.9	5.2	<5.0	<5.0	<5.0	7.4	6.9	8.4	13	8	8	3
Zirconium	ug/L	2	4	<4	<2	<2	<3	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	< 2	< 2	< 2
Dissolved Mercury	ug/L	0.01	0.2	<0.1	<0.1	<0.1	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	-	-	<0.10	< 0.01	< 0.01	< 0.01	< 0.01
Inorganics																										
Electrical Conductivity	uS/cm	2	NO	1060	1450	1460	1100	1560	1590	1590	1610	1850	1640	1420	1300	1500	1700	1700	1200	2000	2100	1500	1580	1310	2010	1260
pH	No unit	0.05	6.5-8.5	8.33	7.92	7.89	7.49	7.67	7.58	7.69	7.71	7.60	7.49	7.43	7.99	8.07	8.23	8.19	8.15	8.13	7.99	8.05	8.17	8.24	8.03	8.15
Total Hardness (as CaCO3)	mg/L as CaCO3	0.05	NO	299	337	335	274	407	307	298	303	305	325	290	300	300	330	330	280	330	330	300	315	256	344	276
Alkalinity (as CaCO3)	mg/L as CaCO3	2	NO	259	274	276	227	327	266	246	243	245	262	241	200	270	280	280	230	270	270	230	263	200	276	243
Chloride	mg/L	0.04	NO	207	289	273	264	302	315	358	371	443	362	258	260	290	340	340	240	470	470	310	400	390	470	300
Sulphate	mg/L	0.04	NO	34.3	29	26	30	30	30	30	30	45.9	27.2	29.8	23	23	28	29	21	32	32	21	29	19	23	20
Phosphorus (total)	mg/L	0.003	0.030*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.045**	**0.060**	**0.039**
Ammonia as N	as N mg/L	0.10	NO	-	0.58	0.57	0.14	0.62	0.56	0.31	0.33	0.30	0.30	0.45	0.24	0.48	0.40	0.39	0.31	0.40	0.42	0.34	0.20	0.20	0.60	0.30
Unionized Ammonia (calculated)	mg/L as N	0.005	0.02	-	0.001	0.001	0.003	0.001	0.009	0.013	0.014	0.006	0.003	0.009	0.006	0.016	0.010	0.009	0.015	0.004	0.004	0.007	0.002	0.007	0.007	0.005
Calcium	ug/L	10	NO	102000	117000	116000	93600	140000	108000	101000	103000	102000	113000	98600	-	100000	120000	120000	96000	130000	120000	110000	110000	87300	112000	92400
Magnesium	ug/L	1	NO	10700	11000	11000	10600	13700	9130	11100	11200	12400	10500	10800	-	9900	11000	12000	8400	10000	10000	9700	9720	9130	15400	10900
Sodium	ug/L	10	NO	112000	187000	185000	141000	213000	189000	199000	199000	233000	203000	152000	-	180000	220000	220000	140000	300000	300000	200000	199000	170000	290000	147000
Potassium	ug/L	9	NO	3960	3000	3000	3300	4220	5350	3510	3450	4900.00	3060	3100	-	2900	3000	3000	2800	3100	3100	2800	2780	3270	3870	2800

Notes:

1. NO = No objective
2. mg/L = Milligrams per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994 (* = interim guideline only)
5. Bold type and shaded indicates an exceedance of the PWQO

Table 7
Surface Water Analytical Results
Metals and Inorganics
City of Barrie Historic Waste Dyment's Creek

Monitoring Well Location				SWD3																		
Sampling Date				08-Nov-12	23-Apr-13	23-Aug-13	11-Dec-13	26-Nov-14	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	05-Oct-23	13-Sep-24
Sampling Location				South of John Street																		
Parameter	**Units**	**RDL**	**PWQO**						**Field Duplicate of SWD3**													**Re-Sampling**	
Total Metals																						
Aluminum-dissolved	ug/L	1	75	<4	50	50	4	10	7	<1	<1	2	14	<5	5	6	10	<5	10	10	5	6	6
Aluminum (total)	ug/L	1	NO	-	-	90	-	-	-	336	-	-	-	52	60	35	31	42	110	60	126	120	40
Antimony	ug/L	0.9	20	<3	<0.5	0.3	<0.5	<2.5	<2.5	<0.5	0.6	<0.5	<0.5	<0.50	<0.5	<0.50	<0.50	<0.50	<0.50	< 0.9	< 0.9	< 0.9	<0.9
Arsenic	ug/L	0.2	100	<3	<1	0.4	<1	<5	<5	<1	3	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	0.3	0.4	0.4	0.3
Barium	ug/L	0.08	NO	98	110	135	152	102	114	147	190	139	158	140	150	130	120	130	140	124	149	224	131
Beryllium	ug/L	0.007	1100	<1	<0.5	<0.1	<0.5	<2.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.40	<0.40	<0.40	<0.40	<0.40	< 0.007	0.007	< 0.007	< 0.007
Total Bismuth (Bi)	ug/L	0.01	NO	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-	< 0.01
Boron	ug/L	2	200	39	30	33	39	<50	52	103	98	32	30	28	35	39	35	29	31	31	32	35	27
Cadmium	ug/L	0.003	0.2	<0.1	<0.1	0.1	<0.1	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	<0.090	0.015	0.03	0.013	0.006
Chromium	ug/L	0.08	NO	12	3	2.7	3	<5	<5	<1	1	<1	<1	<5	<5	<5	<5	<5.0	<5.0	0.63	1.11	0.97	0.45
Cobalt	ug/L	0.004	0.9	<0.5	0.3	0.1	<0.5	<2.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.5	<0.50	<0.50	<0.50	<0.50	0.171	0.198	0.198	0.095
Copper	ug/L	1.0	5	2	3	**8**	1.8	<2.5	<2.5	<0.5	3.7	<0.5	2.2	3.0000	2.6	1.4	1.2	2.6	2.5	**7.7**	4.3	2.7	<1
Iron	ug/L	7	300	**453**	**750**	**855**	**1020**	**961**	**1950**	**509**	**829**	**709**	**948**	**1400**	**870**	**810**	**750**	**1600**	**1200**	**861**	**2400**	**1310**	**620**
Lead	ug/L	0.09	25	1	<1	1.48	0.4	0.7	1.8	0.2	<0.1	0.7	0.9	<0.50	0.51	<0.50	<0.50	<0.50	1.3	0.47	0.93	1.17	0.25
Total Lithium (Li)	ug/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	-	<5	<5	<5.0	<5.0	<5.0	1.7	4.1	3.1	1.9
Manganese	ug/L	0.01	NO	63	130	69	216	143	259	64	97	76	137	79	67	110	57	150	100	122	102	162	53.8
Molybdenum	ug/L	0.40	40	<2	<5	1.4	<0.5	<2.5	<2.5	0.7	<0.5	0.6	0.7	0.6	1.6	1.7	0.67	0.59	0.63	0.76	1.06	0.82	0.40
Nickel	ug/L	0.10	25	<3	<5	<10	3	<5	<5	<1	<1	<1	<1	<1	1.1	<1.0	<1.0	<1.0	<1.0	0.7	0.9	1.2	0.50
Selenium	ug/L	0.04	100	<4	<1	<1	<1	<5	<5	<1	2	<1	<1	<2	<2.0	<2.0	<2.0	<2.0	<2.0	0.15	0.21	0.19	0.11
Total Silicon (Si)	ug/L	20	NO	-	-	-	-	-	-	-	-	-	-	-	4800	2500	3700	3300	3800	2700	4280	4500	3060
Silver	ug/L	0.05	1	<0.1	<0.1	<0.02	<0.1	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	<0.090	< 0.05	< 0.05	< 0.05	< 0.05
Strontium	ug/L	0.08	NO	652	732	595	764	722	756	723	941	649	665	570	650	770	630	700	700	629	619	808	525
Total Tellurium (Te)	ug/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<10	<1.0	<1.0	< 0.1	< 0.1	< 0.1	< 0.1
Thallium	ug/L	0.005	0.3	<0.3	<0.1	<0.05	<0.1	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.050	<0.05	<0.050	<0.050	<0.050	<0.050	-	< 0.005	< 0.005	< 0.005
Total Tin (Sn)	ug/L	0.06	NO	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	0.08
Titanium	ug/L	0.1	NO	<2	<10	15	<5	<25	<25	<5	<5	<5	<5	5.2	5.9	6.2	<5.0	<5.0	9.1	2.96	7.46	5.97	1.9
Tungsten	ug/L	0.2	30	<10	<5	**40**	<10	<0.050	<10	<0.050	<0.050	<10	<10	<1	<1.0	<1.0	<1.0	<1.0	<1.0	0.10	0.19	0.19	< 0.2
Uranium	ug/L	0.002	5	<2	1	1.25	0.8	1.1	1.2	0.7	0.9	0.7	0.8	0.62	0.65	0.88	0.6	0.88	0.74	1.16	0.444	0.918	0.607
Vanadium	ug/L	0.01	6	3	1	0.6	3.3	<2.5	<2.5	<0.5	0.7	0.6	1	0.75	0.95	0.73	0.69	0.63	1.1	0.78	1.19	1.38	0.58
Zinc	ug/L	2	30	17	<10	15	8	<25	<25	<5	13	6	26	6.2	6.5	<5.0	<5.0	7.8	10	10	19	9	6
Zirconium	ug/L	2	4	<4	<2	<3	<1	<5	<5	<1	**7**	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	-	< 2	< 2	< 2
Dissolved Mercury	ug/L	0.01	0.2	<0.1	<0.1	<0.02	**3**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	-	<0.10	< 0.01	< 0.01	< 0.01	< 0.01
Inorganics																							
Electrical Conductivity	uS/cm	2	NO	1030	1420	1020	1400	1750	1730	1610	1790	1540	1350	1300	1400	1600	1200	1900	1500	1600	1330	1870	1120
pH	No unit	0.05	6.5-8.5	8.33	8.05	7.6	7.68	7.57	7.43	7.72	7.66	7.5	7.41	8.01	8.11	8.20	8.16	8.10	8.08	8.19	7.65	8.14	7.97
Total Hardness (as CaCO3)	mg/L as CaCO3	0.05	NO	290	326	258	401	280	312	289	317	298	329	300	290	320	280	340	300	305	258	351	249
Alkalinity (as CaCO3)	mg/L as CaCO3	2	NO	255	269	212	325	270	292	238	246	257	228	210	260	280	230	280	230	244	207	271	224
Chloride	mg/L	0.04	NO	200	269	244	268	355	308	393	414	335	249	270	250	320	230	440	310	430	350	420	270
Sulphate	mg/L	0.04	NO	35.6	28	30	30	30	30	30	48.1	28.5	30	23	24	30	20	29	21	32	18	24	20
Phosphorus (total)	mg/L	0.003	0.030*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.080**	**0.063**	**0.033**
Ammonia as N	as N mg/L	0.10	NO	-	0.12	0.1	0.31	0.3	0.69	0.15	0.12	0.15	0.37	0.35	0.31	0.14	0.15	0.38	0.21	< 0.1	0.40	0.30	0.20
Unionized Ammonia (calculated)	mg/L as N	0.005	0.02	-	<0.001	0.009	0.001	0.006	0.013	0.007	0.002	0.002	0.010	0.010	0.013	0.003	0.008	0.005	0.005	< 0.001	0.015	0.005	0.004
Calcium	ug/L	10	NO	99000	114000	88600	139000	97300	109000	97600	105000	103000	112000	-	100000	120000	92000	120000	110000	107000	88100	113000	82900
Magnesium	ug/L	1	NO	10400	10000	10100	13000	8790	9460	11000	13200	9800	12200	-	12000	11000	8500	10000	10000	9600	9330	16600	10100
Sodium	ug/L	10	NO	108000	184000	128000	207000	216000	210000	207000	237000	182000	163000	-	170000	210000	140000	270000	200000	222000	186000	269000	126000
Potassium	ug/L	9	NO	4040	3000	3200	3770	5420	5460	3530	5170	2760	3740	-	2900	3000	2700	2900	2900	2880	3430	3900	2540

Notes:

1. NO = No objective
2. mg/L = Milligrams per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994 (* = interim guideline only)
5. Bold type and shaded indicates an exceedance of the PWQO

Table 7
Surface Water Analytical Results
Metals and Inorganics
City of Barrie Historic Waste Dyment's Creek

Monitoring Well Location				SWD4																
Sampling Date				23-Aug-13	11-Dec-13		26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	05-Oct-23	13-Sep-24
Sampling Location				Between Innisfil and Sanford Streets																
Parameter	**Units**	**RDL**	**PWQO**			**Field Duplicate of SWD4**														**Re-Sampling**	
Total Metals																					
Aluminum-dissolved	ug/L	1	75	50	4	3	7	<1	<1	<1	<1	<5	6	<5	8	<5	6	15	10	6	5
Aluminum (total)	ug/L	1	NO	80	-	-	-	324	-	-	-	320	50	93	37	32	41	37	48	34	25
Antimony	ug/L	0.9	20	0.2	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	<0.50	<0.5	<0.50	<0.50	<0.50	<0.50	< 0.9	< 0.9	< 0.9	<0.9
Arsenic	ug/L	0.2	100	0.4	<1	<1	<1	<1	5	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	0.3	0.2	0.4	0.3
Barium	ug/L	0.08	NO	160.000	156.000	149.000	110.000	176.000	203.000	161	145	130	150	140	120	130	130	131	118	225	150
Beryllium	ug/L	0.007	1100	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.40	<0.40	<0.40	<0.40	<0.40	< 0.007	< 0.007	< 0.007	< 0.007
Total Bismuth (Bi)	ug/L	0.01	NO	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-	< 0.01
Boron	ug/L	2	200	35	43	40.000	54.000	95.000	103.000	37	28	27	37	38	35	30	31	33	29	38	31
Cadmium	ug/L	0.003	0.2	0.08	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.22000**	<0.09	<0.090	<0.090	<0.090	<0.090	0.010	0.023	0.012	0.012
Chromium	ug/L	0.08	NO	9	4	4	1	<1	2	<1	<1	<5	<5	<5	<5	<5.0	<5.0	0.62	0.78	0.91	0.38
Cobalt	ug/L	0.004	0.9	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.5	<0.50	<0.50	<0.50	<0.50	0.175	0.110	0.167	0.123
Copper	ug/L	1.0	5	**9.3**	1.8	1.5	<0.5	<0.5	**7.2**	<0.5	1.9	**7.3**	1.7	2.3	1.5	2.0	1.3	2.1	2.8	1.8	1.0
Iron	ug/L	7	300	**1050**	**1340**	**1340**	**704**	**1360**	**1810**	**1160**	**816**	**1700**	**960**	**1700**	**710**	**1100**	**1000**	**1250**	**852**	**1210**	**929**
Lead	ug/L	0.09	25	1.43	<0.1	0.1	0.4	1.2	2	0.7	0.4	3.4	<0.50	0.66	<0.50	<0.50	<0.50	0.20	0.31	0.49	0.26
Total Lithium (Li)	ug/L	0.1	NO	-	-	-	-	-	-	-	-	-	<5	<5	<5.0	<5.0	<5.0	1.9	2.3	3.4	2.3
Manganese	ug/L	0.01	NO	126	242	238	139	203	183	138	139	160.000	86	150	73	170	110	142	79.4	257	92
Molybdenum	ug/L	0.40	40	2.4	0.6	0.7	0.8	0.7	<0.5	0.8	0.8	22	1.3	0.68	0.75	0.76	0.64	0.79	1.02	0.89	0.50
Nickel	ug/L	0.10	25	<10	3	3	<1	<1	1	<1	<1	1.3	<1.0	<1.0	<1.0	<1.0	<1.0	0.6	0.8	1.0	0.60
Selenium	ug/L	0.04	100	<1	<1	<1	<1	<1	3	<1	<1	<2	<2.0	<2.0	<2.0	<2.0	<2.0	0.15	0.19	0.13	0.13
Total Silicon (Si)	ug/L	20	NO	-	-	-	-	-	-	-	-	-	4100	2900	3800	3300	3900	2920	3880	4780	3500
Silver	ug/L	0.05	1	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	<0.090	< 0.05	< 0.05	< 0.05	< 0.05
Strontium	ug/L	0.08	NO	643	767	752	764	698	892	683.000	593.000	560.000	640	750	630	740	660	609	594	781	573
Total Tellurium (Te)	ug/L	0.1	NO	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<10	<1.0	<1.0	< 0.1	< 0.1	< 0.1	< 0.1
Thallium	ug/L	0.005	0.3	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.050	<0.05	<0.050	<0.050	<0.050	<0.050	-	< 0.005	< 0.005	< 0.005
Total Tin (Sn)	ug/L	0.06	NO	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	0.11
Titanium	ug/L	0.1	NO	<5	<5	<5	<5	<5	7	<5	<5	21	7.9	9.6	<5.0	<5.0	5.2	2.07	1.79	1.67	1.20
Tungsten	ug/L	0.2	30	10	<10	<10	<10	<10	<10	<10	<10	<1	<1.0	<1.0	<1.0	<1.0	<1.0	0.10	0.13	0.14	< 0.2
Uranium	ug/L	0.002	5	0.89	0.8	0.9	1.1	0.6	0.8	0.7	0.6	0.63	0.58	0.87	0.62	0.94	0.70	1.05	0.472	0.734	0.602
Vanadium	ug/L	0.01	6	0.5	3.3	2.5	<0.7	0.5	1.2	0.5	0.6	1.6	0.72	0.92	0.74	0.68	0.74	0.70	0.87	0.84	0.59
Zinc	ug/L	2	30	14	6	<5	9	10.000	29.000	10.000	8.000	25.000	6.3	8.4	<5.0	8.6	7.0	6	9	5	3
Zirconium	ug/L	2	4	<3	<1	<1	1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	-	< 2	< 2	< 2
Dissolved Mercury	ug/L	0.01	0.2	<0.02	0.2	**0.9**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	-	<0.10	< 0.01	< 0.01	< 0.01	< 0.01
Inorganics																					
Electrical Conductivity	uS/cm	2	NO	1120	1420	1570	1680	1700	1880	1660	1410	1300	1500	1700	1200	2000	1500	1620	1340	2010	1200
pH	No unit	0.05	6.5-8.5	7.55	7.63	7.68	7.55	7.64	7.62	7.44	7.50	7.99	8.08	8.16	8.14	8.11	8.19	8.16	8.25	8.09	7.94
Total Hardness (as CaCO3)	mg/L as CaCO3	0.05	NO	275	412	409	300	314	330	335	318	300	300	330	290	340	290	312	250	352	273
Alkalinity (as CaCO3)	mg/L as CaCO3	2	NO	229	326	325	268	266	240	267	254	200	260	290	240	280	120	261	204	273	225
Chloride	mg/L	0.04	NO	242	318	328	304	490	433	391	276	260	280	340	240	470	310	410	390	460	300
Sulphate	mg/L	0.04	NO	30	40	30	30	30	45.7	27.2	27.6	24	24	28	20	31	21	33	17	22	19
Phosphorus (total)	mg/L	0.003	0.030*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.042**	**0.048**	**0.034**
Ammonia as N	as N mg/L	0.10	NO	0.14	0.66	0.88	0.40	0.34	0.34	0.31	0.37	0.34	0.44	0.60	0.32	0.69	0.40	0.40	0.30	0.50	0.30
Unionized Ammonia (calculated)	mg/L as N	0.005	0.02	0.003	0.002	0.002	0.008	0.015	0.007	0.003	0.006	0.008	0.015	0.013	0.015	0.006	0.007	0.003	0.008	0.007	0.005
Calcium	ug/L	10	NO	99100	143000	142000	105000	107000	110000	117000	108000	-	110000	120000	98000	120000	110000	109000	85500	115000	91800
Magnesium	ug/L	1	NO	11200	13400	13100	9220	11400	13400	10600	11600	-	10000	12000	8800	10000	9600	9600	8940	15700	10700
Sodium	ug/L	10	NO	151000	230000	229000	192000	213000	250000	216000	167000	-	180000	210000	140000	300000	200000	221000	169000	300000	149000
Potassium	ug/L	9	NO	3500	4290	4170	4500	3550	5080	3100	3370	-	3000	3000	2800	3100	2800	2870	3230	3850	2760

Notes:

1. NO = No objective
2. mg/L = Milligrams per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994 (* = interim guideline only)
5. Bold type and shaded indicates an exceedance of the PWQO

Table 7
Surface Water Analytical Results
Metals and Inorganics
City of Barrie Historic Waste Dyment's Creek

Monitoring Well Location				SWD5																				FIELD BLANK
Sampling Date				23-Aug-13	11-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	17-Sep-21	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	26-Apr-23	30-Aug-23	05-Oct-23	05-Oct-23	13-Sep-24	13-Sep-24	13-Sep-24
Sampling Location				Between John and Innisfil Streets																				
Parameter	**Units**	**RDL**	**PWQO**												**Field Duplicate of SWD5**				**Field Duplicate of SWD5**		**Re-Sampling**	**Field Duplicate of SWD5**		**Field Duplicate of SWD5**	
Total Metals																									
Aluminum-dissolved	ug/L	1	75	**210**	5	10	<1	<1	4	<1	8	6	5	10	10	6	8	10	10	8	5	6	5	6	14
Aluminum (total)	ug/L	1	NO	**510**	-	-	238	-	-	-	40	4.9	23	49	49	36	64	46	50	48	117	117	73	71	<1
Antimony	ug/L	0.9	20	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	<0.9	<0.9	<0.9
Arsenic	ug/L	0.2	100	0.8	<1	<1	<1	4	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	0.3	0.3	0.3	0.5	0.4	0.3	0.3	<0.2
Barium	ug/L	0.08	NO	180.000	157.000	110.000	157.000	189.000	167	145	120	160	130	120	120	130	140	129	125	109	222	223	144	139	<0.08
Beryllium	ug/L	0.007	1100	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	< 0.007	0.008	< 0.007	0.018	< 0.007	0.007	< 0.007	< 0.007
Total Bismuth (Bi)	ug/L	0.01	NO	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	< 0.01	< 0.01	-
Boron	ug/L	2	200	35	43	55	83	81	38	27	26	35	36	37	37	29	31	33	31	28	36	36	29	28	< 2
Cadmium	ug/L	0.003	0.2	**0.46**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	<0.090	<0.090	0.013	0.009	0.010	0.017	0.024	0.029	0.030	< 0.003
Chromium	ug/L	0.08	NO	4.8	4	2	<1	<1	<1	<1	<5	<5	<5	<5	<5	<5.0	<5.0	0.65	0.58	0.82	0.98	1.01	0.57	0.57	< 0.08
Cobalt	ug/L	0.004	0.9	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.178	0.175	0.110	0.200	0.205	0.142	0.130	< 0.004
Copper	ug/L	1.0	5	**25.6**	2.4	<0.5	<0.5	3	<0.5	1.8	2	2.5	1.6	1.6	1.4	2.5	2.0	1.6	1.3	3.0	3.4	2.3	2.0	1.0	<1
Iron	ug/L	7	300	**4420**	**1340**	**617**	**678**	**878**	**858**	**871**	**670**	**810**	**1100**	**670**	**670**	**800**	**960**	**1080**	**870**	**752**	**1470**	**1500**	**919**	**885**	<7
Lead	ug/L	0.09	25	1.05	0.6	0.5	0.4	<0.1	0.4	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.59	0.24	0.24	0.29	1.31	1.29	1.50	1.85	< 0.09
Total Lithium (Li)	ug/L	0.1	NO	-	-	-	-	-	-	-	-	<5	<5	<5.0	<5.0	<5.0	<5.0	1.9	1.7	2.3	3.4	3.4	2.3	2.2	< 0.1
Manganese	ug/L	0.01	NO	383	215	124	99	102	88	119	68.000	62	110	61	61	140	92	125	123	61.6	218	221	79.7	76.4	< 0.01
Molybdenum	ug/L	0.40	40	1.5	0.6	0.9	1	<0.5	0.8	0.8	0.7	1.2	0.62	0.79	0.80	0.67	0.67	0.74	0.67	1.02	0.80	0.91	0.50	0.50	< 0.4
Nickel	ug/L	0.10	25	<10	3	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.6	0.7	0.8	1.3	1.1	0.60	0.60	< 0.1
Selenium	ug/L	0.04	100	<1	<1	<1	<1	2	<1	<1	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	0.15	0.16	0.18	0.14	0.13	0.10	0.11	< 0.04
Total Silicon (Si)	ug/L	20	NO	-	-	-	-	-	-	-	-	4700	2700	3900	4000	3300	3900	2800	2770	3630	4550	4560	3350	3220	< 20
Silver	ug/L	0.05	1	0.04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	<0.090	<0.090	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Strontium	ug/L	0.08	NO	641	754	776	718	869	726.000	593.000	550.000	630	760	660	660	720	680	612	627	588	784	784	555	526	< 0.08
Total Tellurium (Te)	ug/L	0.1	NO	-	-	-	-	-	-	-	-	<1.0	<1.0	<10	<10	<1.0	<1.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Thallium	ug/L	0.005	0.3	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.050	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	-	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Total Tin (Sn)	ug/L	0.06	NO	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	0.17	0.14	< 0.06
Titanium	ug/L	0.1	NO	26	<5	<5	<5	<5	<5	<5	<5.0	<5.0	5.1	<5.0	<5.0	<5.0	5.8	2.26	2.7	2.13	5.80	5.93	3.70	3.50	< 0.1
Tungsten	ug/L	0.2	30	10	<10	<10	<10	<10	<10	<10	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.11	0.10	0.12	0.20	0.18	< 0.2	< 0.2	< 0.2
Uranium	ug/L	0.002	5	0.93	0.8	1.2	0.7	0.8	0.8	0.7	0.63	0.55	0.84	0.64	0.66	0.90	0.71	1.11	1.16	0.483	0.896	0.861	0.61	0.599	< 0.002
Vanadium	ug/L	0.01	6	2.2	3.2	<0.8	<0.5	0.6	<0.5	0.7	0.7	0.71	0.7	0.88	0.89	0.66	0.93	0.72	0.76	0.88	1.37	1.34	0.76	0.74	< 0.01
Zinc	ug/L	2	30	**59**	7	8	6	**38**	6.0	7.0	<5.0	6.5	<5.0	5.6	<5.0	7.5	6.4	6	11	9	10	10	5	6	< 2
Zirconium	ug/L	2	4	<3	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	< 2	< 2	< 2	< 2	< 2	< 2
Dissolved Mercury	ug/L	0.01	0.2	<0.02	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	-	<0.10	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Inorganics																									
Electrical Conductivity	uS/cm	2	NO	1060	1550	1660	1590	1790	1620	1420	1300	1500	1700	1200	1200	2000	1500	1600	1590	1260	1910	1920	1170	1170	4
pH	No unit	0.05	6.5-8.5	7.47	7.71	7.68	7.70	7.64	7.56	7.49	7.98	8.09	8.23	8.16	8.10	8.16	8.04	8.12	8.13	7.76	8.11	8.07	7.94	8.17	6.79
Total Hardness (as CaCO3)	mg/L as CaCO3	0.05	NO	296	412	296	300	304	343	307	300	300	330	280	280	320	290	308	307	245	344	346	263	255	< 0.05
Alkalinity (as CaCO3)	mg/L as CaCO3	2	NO	219	319	279	249	250	257	240	200	260	280	230	230	270	240	257	247	192	269	267	214	212	3
Chloride	mg/L	0.04	NO	218	311	326	372	421	358	270	260	260	340	220	230	470	300	450	410	390	430	430	300	360	< 0.2
Sulphate	mg/L	0.04	NO	30	40	30	30	46.1	28.1	27.0	23	24	29	21	21	32	23	32	35	17	24	25	20	20	< 0.2
Phosphorus (total)	mg/L	0.003	0.030*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.040**	**0.063**	**0.064**	**0.040**	**0.043**	< 0.003
Ammonia as N	as N mg/L	0.10	NO	0.07	0.48	0.26	0.21	0.22	0.24	0.41	0.22	0.27	0.30	0.18	0.16	0.21	0.21	0.10	0.50	0.10	0.40	0.40	0.20	0.20	< 0.1
Unionized Ammonia (calculated)	mg/L as N	0.005	0.02	0.005	0.001	0.005	0.011	0.004	0.002	0.005	0.006	0.011	0.008	0.008	0.007	0.003	0.005	< 0.001	0.015	0.004	0.006	0.006	0.002	0.002	0.002
Calcium	ug/L	10	NO	106000	144000	104000	102000	101000	119000	104000	-	110000	120000	98000	100000	120000	110000	108000	107000	83700	111000	112000	88100	85500	< 0.01
Magnesium	ug/L	1	NO	11600	12900	9110	11200	12600	11100	11600	-	11000	11000	9100	8900	10000	9900	9490	9530	8830	16200	16200	10300	10100	1
Sodium	ug/L	10	NO	139000	226000	237000	202000	228000	214000	162000	-	170000	220000	150000	140000	290000	200000	219000	220000	167000	271000	272000	139000	133000	< 10
Potassium	ug/L	9	NO	3500	4190	5430	3540	4890	3270	3390	-	2900	3000	2900	2900	3000	2900	2900	2880	3150	3980	4030	2680	2630	< 9

Notes:

1. NO = No objective
2. mg/L = Milligrams per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994 (* = interim guideline only)
5. Bold type and shaded indicates an exceedance of the PWQO

Table 8
Surface Water Analytical Results
VOC and Petroleum Hydrocarbons
City of Barrie Historic Waste Sites Dyment's Creek

Surface Water Location				SWD1																						
Sampling Date				08-Nov-12	23-Apr-13	23-Aug-13	11-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16		15-Sep-17	07-Sep-18		05-Sep-19	11-Sep-20	10-May-21	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	30-Aug-23	05-Oct-23	13-Sep-24
Sampling Location				West of Bradford Street																						
Parameter	Units	RDL	PWQO								Field Duplicate of SWD1			Field Duplicate of SWD1									PHC re-analysis	Re-sampling	
VOC																										
Acetone	µg/L	30	NO	<1.0	<50	< 30	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	<10	< 30	< 30	-	< 30	< 30
Benzene	µg/L	0.5	100	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.17	<0.17	<0.17	< 0.5	< 0.5	-	< 0.5	< 0.5
Bromodichloromethane	µg/L	0.5	200	<0.20	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Bromoform	µg/L	0.5	60	<0.10	<0.4	< 5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 0.5	< 0.5	-	< 0.5	< 0.5
Bromomethane	µg/L	0.5	0.9	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	NO	<0.20	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	-	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	15	<0.10	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Chloroethane	µg/L	1.0	NO	<0.20	<0.2	-	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	µg/L	0.5	NO	<0.20	<0.5	< 1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Chloromethane	µg/L	3.0	700	<0.40	<0.2	-	<3.0	<3.0	<3.0	<3.0	<3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/L	0.5	40	<0.10	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	2.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	2.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	4	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2	NO	<0.20	<0.5	< 2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	< 2	-	< 2	< 2
1,1-Dichloroethane	µg/L	0.5	200	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,2 - Dichloroethane	µg/L	0.5	100	<0.20	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1 Dichloroethylene	µg/L	0.5	40	<0.30	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
cis- 1,2-Dichloroethylene	µg/L	0.5	200	4.2	<0.4	4.7	3.9	1.8	6.4	2.7	2.7	6.7	4.2	4.5	3.0	3.3	4.3	4.6	5.2	6.3	4.4	3.7	-	7.0	3.4
trans- 1,2-Dichloroethylene	µg/L	0.5	200	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	0.7	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,3-Dichloropropene (Cis + Trans)	µg/L	0.5	NO	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	8	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Ethylene Dibromide	µg/L	0.2	5	<0.10	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	-	< 0.2	< 0.2
n-Hexane	µg/L	1	NO	<0.20	<5	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 1	< 1	-	< 1	< 1
Methylene Chloride	µg/L	0.5	100	<0.30	<4.0	< 5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 0.5	< 0.5	-	< 0.5	< 0.5
Methyl Isobutyl Ketone	µg/L	20	NO	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	< 20	< 20	-	< 20	< 20
Methyl Ethyl Ketone	µg/L	20	400	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	<10	< 20	< 20	-	< 20	< 20
Methyl tert-butyl ether	µg/L	2	200	<0.20	<10	< 2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 2	< 2	-	< 2	< 2
Styrene	µg/L	0.5	4	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	20	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	70	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Tetrachloroethylene	µg/L	0.5	50	<0.20	<0.3	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Toluene	µg/L	0.5	0.8	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	10	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	800	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,3,5-Trimethylbenzene	µg/L	0.5	3	-	<0.3	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	µg/L	0.5	20	5.2	7.0	1.1	5.0	2.0	2.0	<0.5	<0.5	<0.5	<0.5	<0.5	0.53	2.9	3.6	4.5	8.1	6.2	2.9	3.9	-	6.5	3.5
Vinyl Chloride	µg/L	0.20	600	1.0	1.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	1.0	0.68	0.31	0.58	0.66	0.66	0.59	0.50	0.40	-	0.80	0.30
m & p-Xylene	µg/L	0.5	32	<0.20	<0.5	< 1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
o-Xylene	µg/L	0.5	40	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Xylene Mixture (Total)	µg/L	0.5	NO	<0.20	<1.0	< 1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5	NO	<0.40	<0.5	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 5	< 5	-	< 5	< 5
Petroleum Hydrocarbons																									
F1-BTEX (C6-C10)	µg/L	25	NO	-	<100	<50	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	< 25	< 25	-	< 25	< 25
F2 (C10-C16)	µg/L	100	NO	-	<100	<50	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	< 100	< 100	< 100	< 100	< 100
F3 (C16-C34)	µg/L	200	NO	-	<200	<400	<100	<100	<100	<100	<100	<100	<100	<100	<200	200	<200	<200	<200	<200	< 200	2040	2040	< 200	< 200
F4 (C34-C50)	µg/L	200	NO	-	<200	<400	<100	<100	<100	<100	<100	<100	<100	<100	<200	<200	<200	<200	<200	<200	< 200	512	512	< 200	< 200

Notes:

1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO

Table 8
Surface Water Analytical Results
VOC and Petroleum Hydrocarbons
City of Barrie Historic Waste Sites Dyment's Creek

Surface Water Location				SWD2																										
Sampling Date				08-Nov-12	23-Apr-13		23-Aug-13	11-Dec-13	26-Nov-14	24-Sep-15		07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	10-May-21	17-Sep-21	11-Apr-22	11-Apr-22	30-Sep-22	29-Nov-22	29-Nov-22	26-Apr-23	30-Aug-23	30-Aug-23	05-Oct-23	13-Sep-24
Sampling Location				West of Innisfil Street																										
Parameter	**Units**	**RDL**	**PWQO**			**Field Duplicate of SWD2**					**Field Duplicate of SWD2**							**Field Duplicate of SWD2**			**Field Duplicate of SWD2**			**Field Duplicate of SWD2**			**PHC Re-Analysis**	**Re-Analysis**	
VOC																														
Acetone	µg/L	30	NO	<1.0	<50	<50	< 30	<5.0	<5.0	<5.0	<5.0	<5.0	8.0	<5.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	< 30	< 30	-	< 30	< 30
Benzene	µg/L	0.5	100	0.20	<0.5	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.17	<0.17	<0.17	<0.17	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Bromodichloromethane	µg/L	0.5	200	<0.20	<0.3	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Bromoform	µg/L	0.5	60	<0.10	<0.4	<0.4	< 5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 0.5	< 0.5	-	< 0.5	< 0.5
Bromomethane	µg/L	0.5	0.9	<0.20	<0.5	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	NO	<0.20	<0.2	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.19	<0.19	< 0.2	< 0.2	-	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	15	<0.10	<0.2	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Chloroethane	µg/L	1.0	NO	<0.20	<0.2	<0.2	-	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	µg/L	0.5	NO	<0.20	<0.5	<0.5	< 1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Chloromethane	µg/L	3.0	700	<0.40	<0.2	<0.2	-	<3.0	<3.0	<3.0	<3.0	<3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/L	0.5	40	<0.10	<0.3	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	2.5	<0.10	<0.4	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	2.5	<0.10	<0.4	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	4	<0.10	<0.4	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2	NO	<0.20	<0.5	<0.5	< 2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	< 2	-	< 2	< 2
1,1-Dichloroethane	µg/L	0.5	200	<0.30	<0.4	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,2 - Dichloroethane	µg/L	0.5	100	<0.20	<0.2	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.49	<0.49	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1 Dichloroethylene	µg/L	0.5	40	<0.30	<0.5	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
cis- 1,2-Dichloroethylene	µg/L	0.5	200	<0.20	<0.4	<0.4	3.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	44	<0.50	0.50	2.1	<0.50	<0.50	57	<0.50	<0.50	1	< 0.5	-	22.8	< 0.5
trans- 1,2-Dichloroethylene	µg/L	0.5	200	<0.20	<0.4	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	0.7	<0.20	<0.5	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,3-Dichloropropene (Cis + Trans)	µg/L	0.5	NO	<0.30	<0.4	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	8	<0.10	<0.5	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Ethylene Dibromide	µg/L	0.2	5	<0.10	<0.2	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.19	<0.19	< 0.2	< 0.2	-	< 0.2	< 0.2
n-Hexane	µg/L	1	NO	<0.20	<5	<5	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 1	< 1	-	< 1	< 1
Methylene Chloride	µg/L	0.5	100	<0.30	<4.0	<4.0	< 5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 0.5	< 0.5	-	< 0.5	< 0.5
Methyl Isobutyl Ketone	µg/L	20	NO	<1.0	<10	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	< 20	< 20	-	< 20	< 20
Methyl Ethyl Ketone	µg/L	20	400	<1.0	<10	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	< 20	< 20	-	< 20	< 20
Methyl tert-butyl ether	µg/L	2	200	<0.20	<10	<10	< 2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 2	< 2	-	< 2	< 2
Styrene	µg/L	0.5	4	<0.10	<0.5	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	20	<0.10	<0.5	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	70	<0.10	<0.5	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
Tetrachloroethylene	µg/L	0.5	50	<0.20	<0.3	<0.3	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Toluene	µg/L	0.5	0.8	<0.20	<0.5	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	10	<0.30	<0.4	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	800	<0.20	<0.4	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
1,3,5-Trimethylbenzene	µg/L	0.5	3	-	<0.3	<0.3	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	µg/L	0.5	20	<0.20	<0.3	<0.3	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.52	**37**	0.48	0.51	1.5	0.48	0.46	**41**	0.43	0.43	0.50	< 0.5	-	19.6	0.70
Vinyl Chloride	µg/L	0.20	600	<0.17	<0.2	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	4.1	<0.20	<0.20	0.34	<0.20	<0.20	6.2	<0.20	<0.20	< 0.2	< 0.2	-	3.7	< 0.2
m & p-Xylene	µg/L	0.5	32	0.20	0.8	0.8	< 1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
o-Xylene	µg/L	0.5	40	<0.10	<0.5	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Xylene Mixture (Total)	µg/L	0.5	NO	0.20	<1.0	<1.0	< 1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5	NO	<0.40	<0.5	<0.5	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 5	< 5	-	< 5	< 5
Petroleum Hydrocarbons																														
F1-BTEX (C6-C10)	µg/L	25	NO	-	<100	<100	<50	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	-	-	< 25	< 25	-	< 25	< 25
F2 (C10-C16)	µg/L	100	NO	-	<100	<100	<50	<100	<100	<100	<100	<100	<100	<100	<100	<100	110	<100	<100	<100	<100	<100	-	-	< 100	< 100	< 100	< 100	< 100
F3 (C16-C34)	µg/L	200	NO	-	<200	<200	<400	<100	<100	<100	<100	<100	<100	<100	<200	<200	<200	<200	<200	<200	<200	<200	-	-	< 200	< 200	< 200	< 200	< 200
F4 (C34-C50)	µg/L	200	NO	-	<200	<200	<400	<100	<100	<100	<100	<100	<100	<100	<200	<200	<200	<200	<200	<200	<200	<200	-	-	< 200	< 200	< 200	< 200	< 200

Notes:

1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO

Table 8
Surface Water Analytical Results
VOC and Petroleum Hydrocarbons
City of Barrie Historic Waste Sites Dyment's Creek

Surface Water Location				SWD3																						
Sampling Date				08-Nov-12	23-Apr-13	23-Aug-13	11-Dec-13	26-Nov-14		24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	17-Sep-21	11-Apr-22	30-Sep-22	18-Nov-22	26-Apr-23	30-Aug-23	30-Aug-23	05-Oct-23	13-Sep-24
Sampling Location				South of John Street																						
Parameter	Units	RDL	PWQO						Field Duplicate of SWD3														PHC Re-Analysis	Re-Analysis	
VOC																										
Acetone	µg/L	30	NO	<1.0	<50	< 30	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	<10	<10	< 30	< 30	-	< 30	< 30
Benzene	µg/L	0.5	100	0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.68	<0.20	<0.20	0.23	<0.17	<0.17	<0.20	< 0.5	1.0	-	< 0.5	< 0.5
Bromodichloromethane	µg/L	0.5	200	<0.20	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Bromoform	µg/L	0.5	60	<0.10	<0.4	< 5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 0.5	< 0.5	-	< 0.5	< 0.5
Bromomethane	µg/L	0.5	0.9	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	NO	<0.20	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.19	< 0.2	< 0.2	-	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	15	<0.10	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	0.21	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Chloroethane	µg/L	1.0	NO	<0.20	<0.2	-	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	µg/L	0.5	NO	<0.20	<0.5	< 1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	0.31	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Chloromethane	µg/L	3.0	700	<0.40	<0.2	-	<3.0	<3.0	<3.0	<3.0	<3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/L	0.5	40	<0.10	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	2.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	2.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	4	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2	NO	<0.20	<0.5	< 2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	< 2	-	< 2	< 2
1,1-Dichloroethane	µg/L	0.5	200	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,2 - Dichloroethane	µg/L	0.5	100	<0.20	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.49	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1 Dichloroethylene	µg/L	0.5	40	<0.30	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
cis- 1,2-Dichloroethylene	µg/L	0.5	200	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
trans- 1,2-Dichloroethylene	µg/L	0.5	200	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	0.7	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,3-Dichloropropene (Cis + Trans)	µg/L	0.5	NO	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	8	0.11	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Ethylene Dibromide	µg/L	0.2	5	<0.10	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.19	< 0.2	< 0.2	-	< 0.2	< 0.2
n-Hexane	µg/L	1	NO	<0.20	<5	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 1	< 1	-	< 1	< 1
Methylene Chloride	µg/L	0.5	100	<0.30	<4.0	< 5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 0.5	< 0.5	-	< 0.5	< 0.5
Methyl Isobutyl Ketone	µg/L	20	NO	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	< 20	< 20	-	< 20	< 20
Methyl Ethyl Ketone	µg/L	20	400	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	<10	<10	< 20	< 20	-	< 20	< 20
Methyl tert-butyl ether	µg/L	2	200	<0.20	<10	< 2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 2	< 2	-	< 2	< 2
Styrene	µg/L	0.5	4	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	20	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	70	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
Tetrachloroethylene	µg/L	0.5	50	<0.20	<0.3	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Toluene	µg/L	0.5	0.8	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.29	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	10	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	800	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
1,3,5-Trimethylbenzene	µg/L	0.5	3	-	<0.3	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	µg/L	0.5	20	<0.20	<0.3	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Vinyl Chloride	µg/L	0.20	600	<0.17	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	-	< 0.2	< 0.2
m & p-Xylene	µg/L	0.5	32	0.28	<0.5	< 1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.24	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
o-Xylene	µg/L	0.5	40	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Xylene Mixture (Total)	µg/L	0.5	NO	0.39	<1.0	< 1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.24	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5	NO	<0.40	<0.5	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 5	< 5	-	< 5	< 5
Petroleum Hydrocarbons																									
F1-BTEX (C6-C10)	µg/L	25	NO	-	<100	<50	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	-	< 25	< 25	-	< 25	< 25
F2 (C10-C16)	µg/L	100	NO	-	<100	<50	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	< 100	< 100	< 100	< 100	< 100
F3 (C16-C34)	µg/L	200	NO	-	<200	<400	<100	<100	<100	<100	<100	<100	<100	<200	<200	<200	<200	<200	<200	-	< 200	689	689	< 200	< 200
F4 (C34-C50)	µg/L	200	NO	-	<200	<400	<100	<100	<100	<100	<100	<100	<100	<200	<200	<200	<200	<200	<200	-	< 200	226	226	< 200	< 200

Notes:

1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO

Table 8
Surface Water Analytical Results
VOC and Petroleum Hydrocarbons
City of Barrie Historic Waste Sites Dyment's Creek

Surface Water Location				SWD4																				
Sampling Date				23-Aug-13	11-Sep-20		26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	17-Sep-21	11-Apr-22	30-Sep-22	18-Nov-22	29-Nov-22	26-Apr-23	30-Aug-23	30-Aug-23	05-Oct-23	13-Sep-24
Sampling Location				Between Innisfil and Sanford Streets																				
Parameter	Units	RDL	PWQO			Field Duplicate of SWD4															PHC Re-Analysis	Re-Analysis	
VOC																								
Acetone	µg/L	30	NO	< 30	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	<10	<10	<10	< 30	< 30	-	< 30	< 30
Benzene	µg/L	0.5	100	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	0.21	<0.17	<0.17	<0.17	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Bromodichloromethane	µg/L	0.5	200	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Bromoform	µg/L	0.5	60	< 5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 0.5	< 0.5	-	< 0.5	< 0.5
Bromomethane	µg/L	0.5	0.9	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	NO	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.19	<0.19	< 0.2	< 0.2	-	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	15	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Chloroethane	µg/L	1.0	NO	-	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	µg/L	0.5	NO	< 1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Chloromethane	µg/L	3.0	700	-	<3.0	<3.0	<3.0	<3.0	<3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/L	0.5	40	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2	NO	< 2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	< 2	-	< 2	< 2
1,1-Dichloroethane	µg/L	0.5	200	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,2 - Dichloroethane	µg/L	0.5	100	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.49	<0.49	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1 Dichloroethylene	µg/L	0.5	40	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
cis- 1,2-Dichloroethylene	µg/L	0.5	200	4.7	3.7	3.8	1.5	6.9	3.0	8.7	4.3	2.6	3.4	4.7	5.2	5.9	6.0	2.4	1.8	4.0	4.9	-	8.8	4.4
trans- 1,2-Dichloroethylene	µg/L	0.5	200	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	0.7	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,3-Dichloropropene (Cis + Trans)	µg/L	0.5	NO	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	8	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Ethylene Dibromide	µg/L	0.2	5	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.19	<0.19	< 0.2	< 0.2	-	< 0.2	< 0.2
n-Hexane	µg/L	1	NO	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 1	< 1	-	< 1	< 1
Methylene Chloride	µg/L	0.5	100	< 5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 0.5	< 0.5	-	< 0.5	< 0.5
Methyl Isobutyl Ketone	µg/L	20	NO	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	< 20	< 20	-	< 20	< 20
Methyl Ethyl Ketone	µg/L	20	400	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	<10	<10	<10	< 20	< 20	-	< 20	< 20
Methyl tert-butyl ether	µg/L	2	200	< 2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 2	< 2	-	< 2	< 2
Styrene	µg/L	0.5	4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	20	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	70	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
Tetrachloroethylene	µg/L	0.5	50	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Toluene	µg/L	0.5	0.8	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.26	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	10	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	800	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	< 0.5	< 0.5	-	< 0.5	< 0.5
1,3,5-Trimethylbenzene	µg/L	0.5	3	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	µg/L	0.5	20	1.5	6.1	6.4	2.0	2.4	<0.5	1.1	<0.5	0.59	3.6	4.7	5.3	10	5.8	2.9	2.0	2.8	5.6	-	10.1	4.9
Vinyl Chloride	µg/L	0.20	600	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	1.1	0.75	0.30	0.46	0.56	0.53	0.60	0.26	0.32	0.30	0.50	-	0.90	0.50
m & p-Xylene	µg/L	0.5	32	< 1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
o-Xylene	µg/L	0.5	40	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Xylene Mixture (Total)	µg/L	0.5	NO	< 1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	-	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5	NO	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 5	< 5	-	< 5	< 5
Petroleum Hydrocarbons																								
F1-BTEX (C6-C10)	µg/L	25	NO	90.000	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	-	-	< 25	< 25	-	< 25	< 25
F2 (C10-C16)	µg/L	100	NO	<50	<100	<100	<189	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	< 100	< 100	< 100	< 100	< 100
F3 (C16-C34)	µg/L	200	NO	<400	<100	<100	<189	<100	<100	<100	<100	<200	<200	<200	<200	<200	<200	-	-	< 200	< 200	< 200	< 200	< 200
F4 (C34-C50)	µg/L	200	NO	<400	<100	<100	<189	<100	<100	<100	<100	<200	<200	<200	<200	<200	<200	-	-	< 200	< 200	< 200	< 200	< 200

Notes:
1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO

Table 8
Surface Water Analytical Results
VOC and Petroleum Hydrocarbons
City of Barrie Historic Waste Sites Dyment's Creek

Surface Water Location				SWD5																																
Sampling Date				23-Aug-13	11-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	2013-06-05	2013-06-05	2013-06-05	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	05-Sep-19	11-Sep-20	10-May-21	17-Sep-21	17-Sep-21	11-Apr-22	30-Sep-22	18-Nov-22	18-Nov-22	29-Nov-22	26-Apr-23	26-Apr-23	30-Aug-23	30-Aug-23	05-Oct-23	05-Oct-23	13-Sep-24	13-Sep-24
Sampling Location				Between John and Innisfil Streets																																
Parameter	**Units**	**RDL**	**PWQO**																		Field Duplicate of SWD5				Field Duplicate of SWD5			Field Duplicate of SWD5		PHC Re-Analysis	Re-Analysis	Field Duplicate of SWD5		Field Duplicate of SWD5
VOC																																				
Acetone	µg/L	30	NO	< 30	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<50	<50	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<30	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30
Benzene	µg/L	0.5	100	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	0.21	<0.20	<0.17	<0.17	<0.17	<0.17	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	µg/L	0.5	200	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	µg/L	0.5	60	< 5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.4	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane	µg/L	0.5	0.9	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	NO	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.19	<0.19	<0.19	< 0.2	< 0.2	< 0.2	-	< 0.2	< 0.2	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	15	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane	µg/L	1.0	NO	-	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	µg/L	0.5	NO	< 1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	0.53	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Chloromethane	µg/L	3.0	700	-	<3.0	<3.0	<3.0	<3.0	-	-	<0.2	<0.2	<0.2	<3.0	<3.0	<3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/L	0.5	40	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.4	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	<0.40	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.4	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	<0.40	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.4	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	<0.40	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2	NO	< 2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	< 2	< 2	-	< 2	< 2	< 2	< 2
1,1-Dichloroethane	µg/L	0.5	200	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.4	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
1,2 - Dichloroethane	µg/L	0.5	100	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.49	<0.49	<0.49	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
1,1 Dichloroethylene	µg/L	0.5	40	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
cis- 1,2-Dichloroethylene	µg/L	0.5	200	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	9.4	6.2	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
trans- 1,2-Dichloroethylene	µg/L	0.5	200	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.4	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	0.7	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichloropropene (Cis + Trans)	µg/L	0.5	NO	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.4	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	8	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Ethylene Dibromide	µg/L	0.2	5	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.19	<0.19	<0.19	< 0.2	< 0.2	< 0.2	-	< 0.2	< 0.2	< 0.2	< 0.2
n-Hexane	µg/L	1	NO	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5	<5	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 1	< 1	< 1	-	< 1	< 1	< 1	< 1
Methylene Chloride	µg/L	0.5	100	< 5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<4.0	<4.0	<4.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Isobutyl Ketone	µg/L	20	NO	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	< 20	< 20	< 20	-	< 20	< 20	< 20	< 20
Methyl Ethyl Ketone	µg/L	20	400	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	< 20	< 20	< 20	-	< 20	< 20	< 20	< 20
Methyl tert-butyl ether	µg/L	2	200	< 2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<10	<10	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 2	< 2	< 2	-	< 2	< 2	< 2	< 2
Styrene	µg/L	0.5	4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	<0.40	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	20	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	70	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	<0.40	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	µg/L	0.5	50	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	µg/L	0.5	0.8	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.27	0.27	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	10	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.4	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	800	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.4	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	<0.40	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
1,3,5-Trimethylbenzene	µg/L	0.5	3	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.3	<0.3	<0.3	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	µg/L	0.5	20	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.3	7.6	3.9	<0.5	<0.5	<0.5	<0.5	0.55	0.59	0.63	0.59	0.59	0.54	0.49	0.39	0.42	0.49	< 0.5	< 0.5	< 0.5	-	0.6	0.7	0.5	0.7
Vinyl Chloride	µg/L	0.20	600	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2	-	< 0.2	< 0.2	< 0.2	< 0.2
m & p-Xylene	µg/L	0.5	32	< 1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
o-Xylene	µg/L	0.5	40	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Xylene Mixture (Total)	µg/L	0.5	NO	< 1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5	NO	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 5	< 5	< 5	-	< 5	< 5	< 5	< 5
Petroleum Hydrocarbons																																				
F1-BTEX (C6-C10)	µg/L	25	NO	<50	<25	<25	<25	<25	<25	<25	<100	<100	<100	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	-	-	-	< 25	< 25	< 25	-	< 25	< 25	< 25	< 25
F2 (C10-C16)	µg/L	100	NO	<60	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
F3 (C16-C34)	µg/L	200	NO	<500	<100	<100	<100	<100	<100	<100	<200	<200	<200	<100	<100	<100	<100	<200	<200	<200	<200	<200	<200	<200	-	-	-	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200
F4 (C34-C50)	µg/L	200	NO	<500	<100	<100	<100	<100	<100	<100	<200	<200	<200	<100	<100	<100	<100	<200	<200	<200	<200	<200	<200	<200	-	-	-	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200

Notes:

1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO

Table 8
Surface Water Analytical Results
VOC and Petroleum Hydrocarbons
City of Barrie Historic Waste Sites Dyment's Creek

Surface Water Location				FIELD BLANK	TRIP BLANK
Sampling Date				13-Sep-24	13-Sep-24
Sampling Location					
Parameter	Units	RDL	PWQO		
VOC					
Acetone	µg/L	30	NO	< 30	< 30
Benzene	µg/L	0.5	100	< 0.5	< 0.5
Bromodichloromethane	µg/L	0.5	200	< 0.5	< 0.5
Bromoform	µg/L	0.5	60	< 0.5	< 0.5
Bromomethane	µg/L	0.5	0.9	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	NO	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	15	< 0.5	< 0.5
Chloroethane	µg/L	1.0	NO	-	-
Chloroform	µg/L	0.5	NO	< 0.5	< 0.5
Chloromethane	µg/L	3.0	700	-	-
Dibromochloromethane	µg/L	0.5	40	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	4	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2	NO	< 2	< 2
1,1-Dichloroethane	µg/L	0.5	200	< 0.5	< 0.5
1,2 - Dichloroethane	µg/L	0.5	100	< 0.5	< 0.5
1,1 Dichloroethylene	µg/L	0.5	40	< 0.5	< 0.5
cis- 1,2-Dichloroethylene	µg/L	0.5	200	< 0.5	< 0.5
trans- 1,2-Dichloroethylene	µg/L	0.5	200	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	0.7	< 0.5	< 0.5
1,3-Dichloropropene (Cis + Trans)	µg/L	0.5	NO	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	8	< 0.5	< 0.5
Ethylene Dibromide	µg/L	0.2	5	< 0.2	< 0.2
n-Hexane	µg/L	1	NO	< 1	< 1
Methylene Chloride	µg/L	0.5	100	< 0.5	< 0.5
Methyl Isobutyl Ketone	µg/L	20	NO	< 20	< 20
Methyl Ethyl Ketone	µg/L	20	400	< 20	< 20
Methyl tert-butyl ether	µg/L	2	200	< 2	< 2
Styrene	µg/L	0.5	4	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	20	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	70	< 0.5	< 0.5
Tetrachloroethylene	µg/L	0.5	50	< 0.5	< 0.5
Toluene	µg/L	0.5	0.8	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	10	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	800	< 0.5	< 0.5
1,3,5-Trimethylbenzene	µg/L	0.5	3	-	-
Trichloroethylene	µg/L	0.5	20	< 0.5	< 0.5
Vinyl Chloride	µg/L	0.20	600	< 0.2	< 0.2
m & p-Xylene	µg/L	0.5	32	< 0.5	< 0.5
o-Xylene	µg/L	0.5	40	< 0.5	< 0.5
Xylene Mixture (Total)	µg/L	0.5	NO	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5	NO	< 5	< 5
Petroleum Hydrocarbons					
F1-BTEX (C6-C10)	µg/L	25	NO	< 25	< 25
F2 (C10-C16)	µg/L	100	NO	< 100	---
F3 (C16-C34)	µg/L	200	NO	< 200	---
F4 (C34-C50)	µg/L	200	NO	< 200	---

Notes:
1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO

Table 9
Surface Water Analytical Results
Polycyclic Aromatic Hydrocarbons
City of Barrie Historic Waste Sites Dyment's Creek

Surface Water Location				SWD1																		
Sampling Location				West of Bradford Street																		
Sampling Date				23-Apr-13	23-Aug-13	11-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16		15-Sep-17	07-Sep-18		05-Sep-19	11-Sep-20	10-May-21	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	05-Oct-23	13-Sep-24
Parameter	Units	RDL	PWQO							Field Duplicate of SWD1			Field Duplicate of SWD1									Re-Analysis	
Polycyclic Aromatic Hydrocarbons																							
Naphthalene	µg/L	0.5	7	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	µg/L	0.1	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	µg/L	0.1	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	µg/L	0.1	0.2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	µg/L	0.1	0.03	*<0.1*	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	<0.030	<0.030	*<0.050*	<0.010	<0.030	<0.030	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	*µg/L*	0.1	0.0008	*<0.1*	*< 0.05*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Fluoranthene	µg/L	0.1	0.0008	*<0.1*	*< 0.05*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Pyrene	µg/L	0.1	NO	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.020	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	*µg/L*	0.1	0.0004	*<0.1*	*< 0.05*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.0085*	<0.010	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Chrysene	*µg/L*	0.1	0.0001	*<0.05*	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	<0.010	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(b)fluoranthene	µg/L	0.1	NO	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	*µg/L*	0.1	0.0002	*<0.05*	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(a)pyrene	µg/L	0.01	NO	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0075	<0.0090	<0.0090	<0.0090	0.02	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	*µg/L*	0.2	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010	<0.050	<0.050	< 0.2	< 0.2	< 0.2	*< 0.2*
Dibenzo(a,h)anthracene	*µg/L*	0.1	0.002	*<0.1*	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0075*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(g,h,i)perylene	*µg/L*	0.2	0.00002	*<0.1*	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*
Biphenyl	µg/L	0.05	0.2	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
1-methylnaphthalene	µg/L	0.5	2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5
2-methylnaphthalene	µg/L	0.5	2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

(1) RDL exceeds criteria

1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO
6. Italicized indicates the RDL is above the PWQO

Table 9
Surface Water Analytical Results
Polycyclic Aromatic Hydrocarbons
City of Barrie Historic Waste Sites Dyment's Creek

Surface Water Location				SWD2																				
Sampling Location				West of Innisfil Street																				
Sampling Date				23-Apr-13		23-Aug-13	11-Dec-13	26-Nov-14	24-Sep-15		07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	10-May-21	17-Sep-21	11-Apr-22	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	05-Oct-23	13-Sep-24
Parameter	**Units**	**RDL**	**PWQO**		**Field Duplicate of SWD2**					**Field Duplicate of SWD2**							**Field Duplicate of SWD2**			**Field Duplicate of SWD2**				**Re-Analysis**	
Polycyclic Aromatic Hydrocarbons																								
Naphthalene	µg/L	0.5	7	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.10	<0.010	<0.050	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	µg/L	0.1	NO	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.10	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	*< 0.1*
Acenaphthene	µg/L	0.1	NO	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.10	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	µg/L	0.1	0.2	<0.1	<0.1	*< 0.7*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	µg/L	0.1	0.03	*<0.1*	*<0.1*	*< 0.7*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	<0.030	<0.030	*<0.050*	*<0.050*	*<0.010*	<0.030	<0.030	<0.030	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	*µg/L*	0.1	0.0008	*<0.1*	*<0.1*	*< 0.7*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.010*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Fluoranthene	*µg/L*	0.1	0.0008	*<0.1*	*<0.1*	***0.85***	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.010*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Pyrene	µg/L	0.1	NO	<0.1	<0.1	< 0.7	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.020	<0.020	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	*µg/L*	0.1	0.0004	*<0.1*	*<0.1*	*< 0.7*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.0085*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Chrysene	*µg/L*	0.1	0.0001	*<0.05*	*<0.05*	*< 0.7*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(b)fluoranthene	µg/L	0.1	NO	<0.05	<0.05	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.0085	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	*µg/L*	0.1	0.0002	*<0.05*	*<0.05*	*< 0.7*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(a)pyrene	µg/L	0.01	NO	<0.01	<0.01	< 0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0075	<0.0075	<0.0090	<0.0090	<0.0090	<0.0090	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	*µg/L*	0.2	NO	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.0085	<0.010	<0.050	<0.050	<0.050	< 0.2	< 0.2	< 0.2	*< 0.2*
Dibenzo(a,h)anthracene	*µg/L*	0.1	0.002	*<0.1*	*<0.1*	*< 0.7*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0075*	*<0.0075*	*<0.010*	*<0.050*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(g,h,i)perylene	*µg/L*	0.2	0.00002	*<0.1*	*<0.1*	*< 0.7*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*<0.050*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*
Biphenyl	µg/L	0.05	0.2	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-methylnaphthalene	µg/L	0.5	2	<0.1	<0.1	23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.10	<0.010	<0.050	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5
2-methylnaphthalene	µg/L	0.5	2	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.10	<0.010	<0.050	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

(1) RDL exceeds criteria

1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO
6. Italicized indicates the RDL is above the PWQO

Table 9
Surface Water Analytical Results
Polycyclic Aromatic Hydrocarbons
City of Barrie Historic Waste Sites Dyment's Creek

Surface Water Location				SWD3																	
Sampling Location				South of John Street																	
Sampling Date				23-Apr-13	23-Apr-13	11-Dec-13	26-Nov-14		24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	05-Oct-23	13-Sep-24
Parameter	Units	RDL	PWQO					Field Duplicate of SWD3												Re-Analysis	
Polycyclic Aromatic Hydrocarbons																					
Naphthalene	µg/L	0.5	7	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	µg/L	0.1	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	µg/L	0.1	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	µg/L	0.1	0.2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	µg/L	0.1	0.03	*<0.1*	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	<0.030	<0.030	*<0.050*	*<0.010*	<0.030	<0.030	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Anthracene	*µg/L*	0.1	0.0008	*<0.1*	*< 0.05*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Fluoranthene	*µg/L*	0.1	0.0008	*<0.1*	*< 0.05*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Pyrene	µg/L	0.1	NO	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.020	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	*µg/L*	0.1	0.0004	*<0.1*	*< 0.05*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Chrysene	*µg/L*	0.1	0.0001	*<0.05*	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(b)fluoranthene	µg/L	0.1	NO	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	*µg/L*	0.1	0.0002	*<0.05*	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(a)pyrene	µg/L	0.01	NO	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0075	<0.0090	<0.0090	<0.0090	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	*µg/L*	0.2	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010	<0.050	<0.050	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzo(a,h)anthracene	*µg/L*	0.1	0.002	*<0.1*	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0075*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(g,h,i)perylene	*µg/L*	0.2	0.00002	*<0.1*	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*
Biphenyl	µg/L	0.05	0.2	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
1-methylnaphthalene	µg/L	0.5	2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.057	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5
2-methylnaphthalene	µg/L	0.5	2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

(1) RDL exceeds criteria

1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO
6. Italicized indicates the RDL is above the PWQO

Table 9
Surface Water Analytical Results
Polycyclic Aromatic Hydrocarbons
City of Barrie Historic Waste Sites Dyment's Creek

Surface Water Location				**SWD4**																
Sampling Location				Between Innisfil and Sanford Streets																
Sampling Date				23-Apr-13	11-Dec-13		26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	05-Oct-23	13-Sep-24
Parameter	**Units**	**RDL**	**PWQO**			**Field Duplicate of SWD4**														**Re-Analysis**	
Polycyclic Aromatic Hydrocarbons																					
Naphthalene	µg/L	0.5	7	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	µg/L	0.1	NO	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	µg/L	0.1	NO	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	µg/L	0.1	0.2	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	µg/L	0.1	0.03	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.030	<0.030	*<0.050*	*<0.010*	<0.030	<0.030	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Anthracene	*µg/L*	0.1	0.0008	*< 0.07*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Fluoranthene	*µg/L*	0.1	0.0008	*< 0.07*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Pyrene	µg/L	0.1	NO	< 0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.020	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	*µg/L*	0.1	0.0004	*< 0.07*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Chrysene	*µg/L*	0.1	0.0001	*< 0.07*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(b)fluoranthene	µg/L	0.1	NO	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	*µg/L*	0.1	0.0002	*< 0.07*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(a)pyrene	µg/L	0.01	NO	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0075	<0.0090	<0.0090	<0.0090	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	*µg/L*	0.2	NO	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010	<0.050	<0.050	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzo(a,h)anthracene	*µg/L*	0.1	0.002	*< 0.07*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0075*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(g,h,i)perylene	*µg/L*	0.2	0.00002	*< 0.07*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.050*	*<0.050*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*
Biphenyl	µg/L	0.05	0.2	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
1-methylnaphthalene	µg/L	0.5	2	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5
2-methylnaphthalene	µg/L	0.5	2	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

(1) RDL exceeds criteria

1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO
6. Italicized indicates the RDL is above the PWQO

Table 9
Surface Water Analytical Results
Polycyclic Aromatic Hydrocarbons
City of Barrie Historic Waste Sites Dyment's Creek

Surface Water Location				SWD5																				FIELD BLANK
Sampling Location				Between John and Innisfil Streets																				
Sampling Date				23-Apr-13	11-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	17-Sep-21	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	26-Apr-23	30-Aug-23	05-Oct-23	05-Oct-23	13-Sep-24	13-Sep-24	13-Sep-24
Parameter	Units	RDL	PWQO												Field Duplicate of SWD5				Field Duplicate of SWD5		Re-Analysis	Field Duplicate of SWD5		Field Duplicate of SWD5	
Polycyclic Aromatic Hydrocarbons																									
Naphthalene	µg/L	0.5	7	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	µg/L	0.1	NO	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	µg/L	0.1	NO	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	µg/L	0.1	0.2	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	µg/L	0.1	0.03	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	<0.030	<0.030	*<0.050*	*<0.010*	*<0.010*	<0.030	<0.030	< 0.1	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Anthracene	µg/L	0.1	0.0008	*< 0.05*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.010*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Fluoranthene	µg/L	0.1	0.0008	*< 0.05*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.010*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Pyrene	µg/L	0.1	NO	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.020	<0.010	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	µg/L	0.1	0.0004	*< 0.05*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Chrysene	µg/L	0.1	0.0001	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(b)fluoranthene	µg/L	0.1	NO	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	µg/L	0.1	0.0002	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(a)pyrene	µg/L	0.01	NO	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0075	<0.0090	<0.0090	<0.0090	<0.0090	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	µg/L	0.2	NO	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010	<0.010	<0.050	<0.050	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzo(a,h)anthracene	µg/L	0.1	0.002	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0075*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
Benzo(g,h,i)perylene	µg/L	0.2	0.00002	*< 0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.050*	*<0.050*	*<0.0085*	*<0.010*	*<0.010*	*<0.050*	*<0.050*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*
Biphenyl	µg/L	0.05	0.2	-	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-methylnaphthalene	µg/L	0.5	2	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
2-methylnaphthalene	µg/L	0.5	2	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

(1) RDL exceeds criteria

1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO
6. Italicized indicates the RDL is above the PWQO

APPENDIX A

2024 Sampling Locations

City of Barrie Dyment's Creek Landfills
2024 Sampling Locations and Elevations

Well	Monitoring Pipe Elevations (masl)	Ground Surface Elevations (masl)	Well Screen Elevations (masl)	
			Top of Screen (masl)	Bottom of Screen (masl)
Site 4				
GP-D7	222.79	222.11	221.35	219.83
GP-D26	224.51	224.63	223.56	220.51
GP-D27	224.60	224.74	223.83	220.78
Site 5				
GP-D15	225.44	224.54	223.92	222.40
GP-D16	226.16	225.25	224.04	222.51
GP-D17	223.94	224.04	223.05	221.53
GP-D19	226.33	225.34	224.12	222.60
Site 6				
GP-D1	226.16	225.28	223.75	222.23
GP-D2	226.09	225.20	223.67	222.15
GP-D3	224.59	223.53	223.22	221.7
GP-D8	226.51	225.58	224.05	222.53
GP-D13	223.81	222.93	222.47	220.95
GP-D14	228.47	227.59	226.06	224.54
GP-D20	228.16	227.25	225.88	222.83
GP-D21	227.82	226.84	225.62	222.57
GP-D23R	226.04	226.18	224.81	221.76

Notes:
m asl - metres above sea level

APPENDIX B

Groundwater Elevations

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D1	226.16	225.28	3.93	3.05	1.52	223.75	222.23	2012-09-17	2.74	1.86	223.41
								2012-12-03	2.55	1.67	223.61
								2012-12-18	2.53	1.65	223.63
								2013-04-04	2.34	1.46	223.82
								2013-06-20	2.52	1.64	223.64
								2013-08-22	2.72	1.84	223.44
								2013-10-11	2.59	1.71	223.56
								2013-12-13	2.56	1.68	223.60
								2014-02-12	2.64	1.76	223.52
								2014-11-27	2.50	1.62	223.66
								2015-03-11	2.71	1.83	223.45
								2015-09-21	2.71	1.83	223.45
								2015-12-14	2.45	1.57	223.70
								2017-02-28	2.19	1.31	223.97
								2018-02-23	2.30	1.42	223.86
								2019-08-29	2.76	1.88	223.40
								2020-03-09	2.49	1.61	223.67
								2020-09-11	3.25	2.37	222.91
								2021-02-03	2.53	1.65	223.63
								2021-09-17	2.58	1.70	223.58
								2022-01-25	2.54	1.66	223.62
								2022-09-28	2.68	1.80	223.48
								2023-02-23	2.39	1.51	223.77
								2023-08-29	2.67	1.79	223.49
								2024-02-22	2.47	1.59	223.69
								2024-09-19	2.69	1.81	223.47

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D2	226.09	225.20	3.94	3.05	1.52	223.67	222.15	2012-09-17	3.52	2.62	222.57
								2012-12-03	3.31	2.42	222.78
								2012-12-18	3.25	2.36	222.84
								2013-04-04	3.05	2.16	223.04
								2013-06-20	3.32	2.43	222.77
								2013-08-22	3.51	2.62	222.58
								2013-10-11	3.37	2.48	222.72
								2013-12-13	3.32	2.42	222.78
								2014-02-12	3.43	2.54	222.66
								2014-11-27	3.27	2.37	222.83
								2015-03-11	3.48	2.59	222.61
								2015-09-21	3.45	2.55	222.64
								2015-12-14	3.11	2.21	222.99
								2016-03-14	2.85	1.95	223.25
								2016-09-06	3.52	2.63	222.57
								2017-02-28	2.95	2.06	223.14
								2018-02-23	2.96	2.07	223.13
								2020-03-09	3.31	2.42	222.78
								2021-02-03	3.31	2.42	222.78
								2021-09-17	3.29	2.40	222.80
								2022-01-25	3.37	2.47	222.72
								2022-09-25	3.47	2.57	222.62
								2023-02-23	3.11	2.22	222.98
								2023-08-29	3.44	2.55	222.65
								2024-02-22	3.21	2.31	222.89
								2024-09-19	3.68	2.79	222.41

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D3	224.59	223.53	2.89	1.83	1.52	223.22	221.70	2012-03-21	1.87	0.81	222.72
								2012-09-17	2.26	1.20	222.33
								2012-12-03	1.87	0.81	222.71
								2012-12-18	1.97	0.91	222.62
								2013-04-04	1.80	0.74	222.79
								2013-06-20	2.04	0.98	222.55
								2013-08-22	2.29	1.23	222.30
								2013-10-11	2.00	0.94	222.59
								2013-12-13	2.03	0.97	222.55
								2014-02-12	2.09	1.03	222.49
								2014-11-27	Damaged	NA	NA
								2015-03-11	Damaged	NA	NA
								2015-09-21	Damaged	NA	NA
								2015-12-14	1.85	0.79	222.74
								2016-03-14	1.44	0.38	223.14
								2016-09-06	dry	dry	NA
								2017-02-28	1.69	0.62	222.90
								2018-02-23	1.51	0.45	223.08
								2020-03-09	1.85	0.79	222.74
								2020-09-11	1.99	0.93	222.60
								2021-02-03	1.89	0.83	222.70
								2021-09-17	1.47	0.41	223.12
								2022-01-25	1.86	0.80	222.72
								2022-09-28	dry	dry	NA
								2022-10-26	1.95	0.89	222.64
								2023-02-23	1.78	0.72	222.81
								2023-08-29	2.04	0.97	222.55
								2024-02-22	1.78	0.72	222.80
								2024-09-19	2.15	1.09	222.44

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D7	222.79	222.11	2.97	2.29	1.52	221.35	219.83	2012-09-17	2.56	1.88	220.24
								2012-12-03	2.53	1.85	220.27
								2012-12-18	2.53	1.85	220.27
								2013-04-04	2.39	1.70	220.41
								2013-06-20	2.43	1.75	220.36
								2013-08-22	2.60	1.92	220.20
								2013-10-11	2.53	1.85	220.26
								2013-12-13	2.53	1.85	220.26
								2014-02-13	2.62	1.94	220.17
								2014-11-27	2.56	1.87	220.24
								2015-03-11	2.45	1.77	220.34
								2015-09-21	2.77	2.09	220.02
								2015-12-14	2.73	2.04	220.07
								2017-02-28	2.45	1.76	220.35
								2017-09-08	2.70	2.02	220.10
								2018-02-23	2.55	1.87	220.24
								2018-09-04	2.70	2.02	220.09
								2019-04-01	2.48	1.80	220.31
								2019-08-29	2.71	2.03	220.09
								2020-02-14	2.47	1.78	220.33
								2020-09-11	2.74	2.06	220.05
								2021-02-03	2.73	2.05	220.06
								2021-09-20	2.72	2.03	220.08
								2022-01-25	2.63	1.94	220.17
								2022-09-28	2.55	1.87	220.25
								2023-03-20	2.54	1.86	220.26
								2023-08-30	2.67	1.98	220.13
								2024-02-22	2.57	1.89	220.22
								2024-09-19	2.68	2.00	220.11

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D8	226.51	225.58	3.98	3.05	1.52	224.05	222.53	2012-12-03	2.92	1.99	223.59
								2012-12-18	2.89	1.96	223.62
								2013-04-04	2.72	1.79	223.79
								2013-06-20	2.84	1.91	223.67
								2013-08-22	3.05	2.11	223.46
								2013-10-11	2.97	2.04	223.53
								2013-12-13	2.89	1.96	223.61
								2014-02-12	3.03	2.10	223.48
								2014-11-27	2.69	1.76	223.82
								2015-03-11	3.06	2.13	223.45
								2015-09-21	3.07	2.14	223.44
								2015-12-14	2.86	1.93	223.65
								2016-03-14	2.59	1.66	223.92
								2016-09-06	3.11	2.18	223.39
								2017-02-28	2.50	1.57	224.01
								2017-09-08	2.93	2.00	223.58
								2018-02-23	2.33	1.39	224.18
								2019-09-04	3.85	2.92	222.66
								2019-04-01	2.71	1.78	223.79
								2019-08-29	3.11	2.18	223.40
								2020-02-14	2.73	1.80	223.78
								2020-09-11	2.96	2.03	223.55
								2021-02-03	2.87	1.94	223.64
								2021-09-17	2.89	1.96	223.62
								2022-01-25	2.87	1.94	223.64
								2022-09-28	dry	dry	NA
								2022-10-26	3.04	2.10	223.47
								2023-03-20	2.75	1.82	223.76
								2023-08-29	2.98	2.05	223.53
								2024-02-22	2.83	1.89	223.68
								2024-09-19	3.00	2.07	223.51

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D13	223.77	222.93	2.82	1.98	1.52	222.47	220.95	2012-12-03	1.25	0.37	222.56
								2012-12-18	1.27	0.39	222.54
								2013-04-04	1.14	0.26	222.67
								2013-06-20	1.30	0.42	222.51
								2013-08-22	1.53	0.68	222.24
								2013-10-11	1.28	0.43	222.50
								2013-12-13	1.29	0.44	222.49
								2014-02-12	1.30	0.45	222.47
								2014-11-27	1.20	0.35	222.57
								2015-03-11	1.37	0.53	222.40
								2015-09-21	1.46	0.62	222.31
								2015-12-14	1.14	0.30	222.63
								2016-03-14	1.00	0.16	222.77
								2016-09-06	1.54	0.70	222.23
								2017-02-28	1.02	0.18	222.75
								2017-09-08	1.39	0.54	222.38
								2018-02-23	0.94	0.10	222.83
								2019-09-04	1.44	0.59	222.34
								2019-04-01	1.37	0.53	222.40
								2019-08-29	1.56	0.72	222.21
								2020-02-14	1.27	0.43	222.50
								2021-02-03	1.20	0.35	222.57
								2021-09-17	nm	nm	na
								2021-10-06	1.18	0.34	222.59
								2022-01-25	1.25	0.41	222.52
								2022-09-28	1.43	0.59	222.34
								2023-03-20	1.14	0.30	222.63
								2023-08-29	1.43	0.59	222.34
								2024-02-22	1.14	0.30	222.63
								2024-03-29	1.21	0.37	222.56
								2024-09-19	1.50	0.66	222.27

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D14	223.89	223.00	3.93	3.05	1.52	221.47	219.95	2012-09-17	2.59	1.70	221.30
								2012-12-03	2.37	1.49	221.51
								2012-12-18	2.42	1.53	221.47
								2013-04-04	2.21	1.32	221.68
								2013-06-20	2.54	1.66	221.34
								2013-08-22	2.63	1.75	221.25
								2013-10-11	2.50	1.62	221.39
								2013-12-13	2.51	1.62	221.38
								2014-02-12	2.54	1.65	221.35
								2014-11-27	2.25	1.36	221.64
								2015-03-11	2.56	1.68	221.33
								2015-09-21	2.63	1.75	221.25
								2015-12-14	2.51	1.63	221.38
								2016-03-14	2.00	1.11	221.89
								2016-09-06	2.65	1.77	221.24
								2016-11-25	2.52	1.64	221.37
								2017-02-27	2.18	1.30	221.71
								2017-09-08	2.57	1.69	221.31
								2018-02-23	2.04	1.16	221.85
								2018-09-04	2.58	1.70	221.31
								2019-04-01	2.44	1.55	221.45
								2019-08-29	2.63	1.74	221.26
								2020-02-14	2.45	1.56	221.44
								2020-09-11	2.59	1.71	221.29
								2021-02-03	2.47	1.59	221.41
								2021-09-17	2.29	1.41	221.60
								2022-01-25	2.59	1.70	221.30
								2022-09-28	2.57	1.69	221.32
								2022-11-18	2.48	1.60	221.40
								2023-03-20	2.40	1.52	221.49
								2023-08-29	2.66	1.78	221.23
								2024-02-22	2.48	1.60	221.40
								2024-09-19	2.65	1.77	221.24

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D15	225.44	224.54	3.05	2.14	1.52	223.91	222.39	2012-12-03	2.88	1.98	222.56
								2012-12-18	2.89	1.99	222.55
								2013-04-04	2.80	1.89	222.64
								2013-06-20	2.89	1.99	222.55
								2013-08-22	3.06	2.15	222.38
								2013-10-11	2.97	2.07	222.47
								2013-12-13	2.90	2.00	222.54
								2014-02-12	3.01	2.10	222.43
								2014-11-27	2.77	1.87	222.67
								2015-03-11	2.90	2.00	222.54
								2015-09-21	3.08	2.17	222.36
								2015-12-14	2.82	1.92	222.62
								2017-02-27	2.69	1.79	222.75
								2017-09-08	2.87	1.97	222.57
								2018-02-23	2.80	1.90	222.64
								2018-09-04	2.91	2.01	222.53
								2019-04-01	2.76	1.86	222.68
								2019-08-29	2.91	2.01	222.53
								2020-02-14	2.78	1.88	222.66
								2021-02-03	dry	na	NA
								2021-09-17	dry	na	NA
								2022-01-25	dry	dry	NA
								2022-09-28	dry	dry	NA
								2022-11-18	dry	dry	NA
								2023-02-24	dry	dry	NA
								2023-08-29	dry	dry	NA
								2024-02-22	dry	dry	NA
								2024-09-19	dry	dry	NA

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D16	226.16	225.25	3.65	2.74	1.52	224.04	222.51	2012-09-17	3.31	2.40	222.85
								2012-12-03	3.25	2.34	222.91
								2012-12-18	3.24	2.33	222.92
								2013-04-04	3.09	2.18	223.07
								2013-06-20	3.10	2.19	223.06
								2013-08-22	3.29	2.39	222.87
								2013-10-11	3.29	2.38	222.87
								2013-12-13	3.24	2.33	222.92
								2014-02-12	3.36	2.45	222.80
								2014-11-27	3.22	2.31	222.94
								2015-03-11	2.99	2.09	223.17
								2015-09-21	3.34	2.43	222.82
								2015-12-14	3.32	2.41	222.84
								2017-02-27	2.96	2.05	223.20
								2017-09-08	3.15	2.24	223.01
								2018-02-23	3.18	2.28	222.98
								2018-09-04	3.30	2.40	222.86
								2019-04-01	3.20	2.30	222.96
								2019-08-29	3.31	2.41	222.85
								2020-02-14	3.18	2.27	222.98
								2021-02-03	3.21	2.31	222.95
								2021-09-17	3.14	2.24	223.02
								2022-01-25	3.16	2.26	223.00
								2022-09-28	3.33	2.43	222.83
								2022-11-18	3.36	2.46	222.80
								2023-03-20	3.05	2.15	223.11
								2023-08-30	3.15	2.25	223.01
								2024-02-22	3.07	2.17	223.09
								2024-09-19	3.16	2.26	223.00

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D17	223.94	224.04	2.41	2.52	1.52	223.05	221.53	2012-12-03	1.98	2.08	221.96
								2012-12-19	1.98	2.08	221.96
								2013-04-04	1.87	1.97	222.07
								2013-06-20	1.73	1.83	222.21
								2013-08-22	2.11	2.21	221.83
								2013-10-11	2.02	2.12	221.92
								2013-12-13	1.94	2.04	222.00
								2014-02-12	2.06	2.16	221.88
								2014-11-27	1.94	2.04	222.00
								2015-03-12	2.11	2.21	221.83
								2015-09-21	2.13	2.23	221.81
								2015-12-14	1.98	2.08	221.96
								2017-03-20	1.71	1.81	222.23
								2017-09-08	2.04	2.15	221.90
								2018-02-23	1.95	2.05	221.99
								2018-09-04	2.16	2.26	221.78
								2019-04-01	1.90	2.00	222.04
								2019-08-29	2.20	2.30	221.74
								2020-02-14	1.94	2.04	222.00
								2020-09-11	2.11	2.21	221.83
								2021-03-03	2.11	2.21	221.84
								2021-09-17	2.05	2.15	221.89
								2022-02-17	2.01	2.12	221.93
								2022-09-28	2.07	2.17	221.87
								2023-02-24	1.95	2.05	221.99
								2023-08-29	2.22	2.32	221.73
								2024-02-22	2.22	2.32	221.73
								2024-02-22	dry @ 2.12	dry	NA
								2024-03-30	1.94	2.04	222.00
								2024-09-19	2.00	2.10	221.94

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D19	226.33	225.34	3.73	2.74	1.52	224.12	222.60	2012-12-03	dry	dry	NA
								2012-12-18	dry	dry	NA
								2013-04-04	dry	dry	NA
								2013-06-20	dry	dry	NA
								2013-08-22	dry	dry	NA
								2013-10-11	dry	dry	NA
								2013-12-13	dry	dry	NA
								2014-02-12	3.36	2.37	222.97
								2014-11-27	3.24	2.25	223.09
								2015-03-11	dry	dry	NA
								2015-09-21	dry	dry	NA
								2015-12-14	dry	dry	NA
								2017-02-28	dry	dry	NA
								2017-09-08	dry	dry	NA
								2018-02-23	dry	dry	NA
								2018-09-04	dry	dry	NA
								2019-04-01	dry	dry	NA
								2019-08-29	dry	dry	NA
								2020-02-14	dry	dry	NA
								2020-09-11	3.74	2.75	222.59
								2021-02-03	dry	dry	NA
								2021-09-17	dry	dry	NA
								2022-01-25	dry	dry	NA
								2022-09-28	dry	dry	NA
								2023-02-24	dry	dry	NA
								2023-08-30	dry	dry	NA
								2024-02-22	dry	dry	NA
								2024-09-19	dry	dry	NA

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D20	228.16	227.25	5.33	4.42	3.05	225.88	222.83	2013-08-22	4.48	3.57	223.67
								2013-10-11	4.42	3.51	223.73
								2013-12-13	4.37	3.46	223.79
								2014-02-12	4.49	3.58	223.67
								2014-11-27	4.36	3.45	223.80
								2015-03-12	4.51	3.60	223.65
								2015-09-21	4.51	3.60	223.65
								2015-12-14	4.37	3.46	223.79
								2017-02-27	4.13	3.22	224.03
								2017-09-08	4.40	3.49	223.75
								2018-02-23	4.27	3.36	223.89
								2018-09-04	4.42	3.51	223.74
								2019-04-01	4.26	3.35	223.90
								2019-08-29	4.55	3.64	223.61
								2020-02-14	4.24	3.33	223.92
								2020-09-11	4.43	3.52	223.72
								2021-02-03	4.36	3.45	223.79
								2021-09-17	4.36	3.45	223.80
								2022-01-25	4.23	3.32	223.92
								2022-09-28	4.46	3.55	223.69
								2023-03-20	4.27	3.36	223.89
								2023-08-29	4.43	3.52	223.72
								2024-02-22	4.32	3.41	223.84
								2024-09-19	4.44	3.53	223.72

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D21	227.82	226.84	5.24	4.27	3.05	225.62	222.57	2013-08-22	4.48	3.50	223.34
								2013-10-11	4.42	3.44	223.40
								2013-12-13	4.34	3.36	223.48
								2014-02-12	4.50	3.53	223.32
								2014-11-27	4.32	3.34	223.50
								2015-03-12	4.52	3.55	223.30
								2015-09-21	4.52	3.55	223.29
								2015-12-14	4.22	3.25	223.59
								2017-02-27	4.01	3.03	223.81
								2018-02-23	4.21	3.23	223.61
								2019-04-01	4.25	3.28	223.57
								2019-08-29	4.57	3.60	223.25
								2020-02-14	4.28	3.30	223.54
								2020-09-11	3.43	2.46	224.38
								2021-02-03	4.35	3.38	223.46
								2021-09-17	4.25	3.28	223.57
								2022-01-25	4.29	3.32	223.53
								2022-09-28	4.49	3.51	223.33
								2023-03-20	4.25	3.27	223.57
								2023-08-29	4.50	3.52	223.32
								2024-02-22	4.31	3.34	223.50
								2024-09-19	4.45	3.48	223.37
GP-D22	227.03	227.15	4.45	4.57	3.05	225.63	222.58	2013-08-22	3.91	4.03	223.11
								2013-10-11	3.85	3.97	223.18
								2013-12-13	3.75	3.88	223.27
								2014-02-25	3.92	4.04	223.11
								2014-11-25	3.70	3.82	223.33
								2015-03-12	3.95	4.07	223.08
								2015-09-21	3.95	4.07	223.08
								2015-12-14	3.63	3.75	223.40
								2017-02-27	3.17	3.29	223.86
								2017-09-08	3.73	3.85	223.30
								2018-02-23	3.63	3.75	223.40
								2018-09-04	3.85	3.97	223.18
								2019-04-01	3.79	3.91	223.24
								2019-08-29	4.00	4.12	223.03
								2020-02-14	3.78	3.90	223.25
								2020-09-11	3.86	3.98	223.17
								2021-03-03	3.81	3.93	223.21
								2021-09-17	3.74	3.86	223.29
								2022-02-17	3.66	3.78	223.37
								2022-09-28	3.87	3.99	223.16
								2023-02-24	3.65	3.77	223.38
								2023-04-13	Decommissioned		

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D23	225.73	225.93	3.77	3.96	3.05	225.02	221.97	2013-08-22	2.69	2.88	223.05
								2013-10-11	2.60	2.79	223.14
								2013-12-13	2.52	2.71	223.21
								2014-02-25	2.69	2.89	223.04
								2014-11-25	2.51	2.71	223.22
								2016-03-16	2.55	2.74	223.18
								2015-09-21	2.71	2.90	223.03
								2015-12-14	2.43	2.62	223.31
								2017-03-28	1.71	1.90	224.03
								2017-09-08	2.52	2.72	223.21
								2018-02-23	2.37	2.56	223.37
								2018-09-04	2.83	3.02	222.90
								2019-04-01	2.73	2.92	223.01
								2019-08-29	2.76	2.96	222.97
								2020-02-14	3.74	3.93	221.99
								2021-03-03	2.74	2.93	223.00
								2021-09-17	2.49	2.68	223.24
								2022-02-24	2.56	2.75	223.18
								2022-09-28	2.82	3.01	222.92
								2023-02-24	2.51	2.70	223.23
								2023-04-13	decommissioned		
GP-D23R	226.04	226.18	4.28	4.42	3.05	224.81	221.76	2023-12-22	2.92	3.06	223.12
								2024-02-22	2.85	2.99	223.19
								2024-09-19	3.00	3.14	223.04
GP-D24	226.79	227.00	5.28	5.49	3.05	224.56	221.51	2013-08-22	4.93	5.14	221.87
								2013-10-11	3.86	4.07	222.93
								2013-12-13	3.77	3.98	223.03
								2014-02-12	Buried	NA	NA
								2014-11-25	3.78	3.99	223.01
								2015-03-12	Buried	NA	NA
								2015-09-21	3.97	4.18	222.83
								2015-12-14	3.07	3.28	223.72
								2017-02-27	3.55	3.76	223.24
								2017-09-08	3.69	3.90	223.11
								2018-02-23	3.66	3.87	223.14
								2018-09-04	3.92	4.13	222.87
								2019-04-01	3.90	4.11	222.89
								2019-08-30	4.01	4.22	222.78
								2020-02-14	3.91	4.12	222.88
								2020-09-11	3.88	4.09	222.91
								2021-03-03	3.83	4.04	222.96
								2021-09-17	3.78	3.99	223.01
								2022-02-24	3.71	3.92	223.08
								2022-09-28	3.82	4.03	222.98
								2023-02-24	3.66	3.87	223.13
								2023-04-13	decommissioned		

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D26	224.51	224.63	4.00	4.12	3.05	223.56	220.51	2013-08-22	2.70	2.81	221.81
								2013-10-11	2.66	2.77	221.86
								2013-12-13	2.55	2.67	221.96
								2014-02-25	2.68	2.80	221.83
								2014-11-27	2.57	2.68	221.94
								2015-03-12	2.75	2.86	221.76
								2015-09-22	2.76	2.88	221.75
								2015-12-14	2.61	2.72	221.91
								2017-02-28	2.30	2.41	222.22
								2017-09-08	2.68	2.79	221.84
								2018-02-23	2.58	2.70	221.93
								2018-09-04	2.79	2.90	221.73
								2019-04-01	2.71	2.82	221.81
								2019-08-29	2.83	2.95	221.68
								2020-02-14	2.69	2.80	221.83
								2021-03-03	2.75	2.86	221.77
								2021-09-17	2.68	2.79	221.83
								2022-02-17	2.66	2.77	221.86
								2022-09-28	2.74	2.85	221.78
								2023-02-24	2.58	2.69	221.94
								2023-08-29	2.84	2.95	221.68
								2024-02-22	2.58	2.69	221.93
								2024-09-19	2.73	2.84	221.78
GP-D27	224.60	224.74	3.83	3.96	3.05	223.83	220.78	2013-08-22	2.39	2.53	222.21
								2013-10-11	2.45	2.58	222.15
								2013-12-13	2.39	2.53	222.21
								2014-02-25	2.57	2.71	222.03
								2014-11-25	2.45	2.58	222.15
								2015-03-12	2.55	2.68	222.05
								2015-09-21	2.53	2.66	222.07
								2015-12-14	2.49	2.62	222.12
								2017-02-28	2.16	2.29	222.44
								2017-09-08	2.31	2.44	222.29
								2018-02-23	2.32	2.46	222.28
								2018-09-04	2.50	2.63	222.10
								2019-04-01	2.45	2.58	222.16
								2019-08-29	2.50	2.63	222.10
								2020-02-14	2.47	2.60	222.13
								2021-03-03	2.35	2.48	222.26
								2021-09-17	2.33	2.46	222.27
								2022-02-17	2.35	2.48	222.26
								2022-09-28	2.50	2.63	222.10
								2023-02-24	2.23	2.36	222.37
								2023-08-29	2.27	2.41	222.33
								2024-02-22	2.18	2.31	222.43
								2024-09-19	2.22	2.35	222.38

masl = metres above sea level
mbmp = metres below monitoring pipe
mbgs = metres below ground surface

APPENDIX C

Laboratory Certificates of Analysis

FINAL REPORT

CA14537-SEP24 R1

C A-GLD-23592540

Prepared for

WSP Canada Inc.

FINAL REPORT

First Page

CLIENT DETAILS

Client	WSP Canada Inc.
Address	121 Commerce Park Dr, Unit L Barrie, ON L4N 8X1. Canada
Contact	Christi Groves
Telephone	705-718-1446
Facsimile	
Email	christi.groves@wsp.com
Project	C A-GLD-23592540
Order Number	
Samples	Surface Water (6)

LABORATORY DETAILS

Project Specialist	Brad Moore Hon. B.Sc
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2143
Facsimile	705-652-6365
Email	brad.moore@sgs.com
SGS Reference	CA14537-SEP24
Received	09/16/2024
Approved	09/20/2024
Report Number	CA14537-SEP24 R1
Date Reported	09/25/2024

COMMENTS

Temperature of Sample upon Receipt: 15 degrees C
Cooling Agent Present:YES
Custody Seal Present:YES

Chain of Custody Number: 036464

Revision 1 - metals reports as ug/L

SIGNATORIES

Brad Moore Hon. B.Sc

TABLE OF CONTENTS

Client: WSP Canada Inc.
Project: C A-GLD-23592540
Project Manager: Christi Groves
Samplers: Serena and Nicole

MATRIX: WATER

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number				9	10	11	12	13	14
Sample Name				SWD1	SWD4	SWD2	SWD5	SWD3	DUP2
Sample Matrix				Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date				13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
BTEX									
Benzene	µg/L	0.5	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	µg/L	0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Xylene (total)	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
m/p-xylene	µg/L	0.5	2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
o-xylene	µg/L	0.5	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
General Chemistry									
Alkalinity	mg/L as CaCO3	2		221	225	243	214	224	212
Temperature @ pH	°C	0		20.7	17.7	21.0	17.9	17.9	20.7
Conductivity	uS/cm	2		1220	1200	1260	1170	1120	1170
Ammonia+Ammonium (N)	as N mg/L	0.1		0.3	0.3	0.3	0.2	0.2	0.2
Unionized Ammonia	mg/L as N	0.001	0.02	0.018	0.008	0.015	0.006	0.005	0.011
Metals and Inorganics									
Sulphate	mg/L	0.2		2.0	19	20	20	20	20
Hardness	µg/L	50		264000	273000	276000	263000	249000	255000
Aluminum (0.2µm)	µg/L	1	75	4	5	5	5	6	6
Boron (total)	µg/L	2	200	30	31	29	29	27	28
Bismuth (total)	µg/L	0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Calcium (total)	µg/L	10		88500	91800	92400	88100	82900	85500
Iron (total)	µg/L	7	300	907	929	893	919	620	885
Magnesium (total)	µg/L	1		10400	10700	10900	10300	10100	10100

Client: WSP Canada Inc.
Project: C A-GLD-23592540
Project Manager: Christi Groves
Samplers: Serena and Nicole

MATRIX: WATER

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number				9	10	11	12	13	14
Sample Name				SWD1	SWD4	SWD2	SWD5	SWD3	DUP2
Sample Matrix				Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date				13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics (continued)									
Aluminum (total)	µg/L	1		30	25	24	73	40	71
Antimony (total)	µg/L	0.9	20	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Arsenic (total)	µg/L	0.2	5	0.3	0.3	0.3	0.3	0.3	0.3
Barium (total)	µg/L	0.08		150	150	143	144	131	139
Beryllium (total)	µg/L	0.007	1100	< 0.007	< 0.007	< 0.007	0.007	< 0.007	< 0.007
Cadmium (total)	µg/L	0.003	0.5	0.034	0.012	0.008	0.029	0.006	0.030
Cobalt (total)	µg/L	0.004	0.9	0.12	0.12	0.10	0.14	0.095	0.13
Chromium (total)	µg/L	0.08	100	0.4	0.4	0.4	0.6	0.4	0.6
Copper (total)	µg/L	1	5	1	1	1	2	< 1	1
Manganese (total)	µg/L	0.01		78	92	70	80	54	76
Molybdenum (total)	µg/L	0.4	40	0.5	0.5	0.5	0.5	0.4	0.5
Potassium (total)	µg/L	9		2660	2760	2800	2680	2540	2630
Sodium (total)	µg/L	10		145000	149000	147000	139000	126000	133000
Nickel (total)	µg/L	0.1	25	0.5	0.6	0.5	0.6	0.5	0.6
Phosphorus (total)	µg/L	3	10	36	34	39	40	33	43
Lead (total)	µg/L	0.09	25	0.337	0.257	0.219	1.50	0.247	1.85
Lithium (total)	µg/L	0.1		2	2	2	2	2	2
Selenium (total)	µg/L	0.04	100	0.112	0.125	0.0950	0.100	0.114	0.114
Silicon (total)	µg/L	20		3540	3500	3400	3350	3060	3220
Silver (total)	µg/L	0.05	0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Strontium (total)	µg/L	0.08		537	573	579	555	525	526
Tellurium (total)	µg/L	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

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Samplers: Serena and Nicole

MATRIX: WATER

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number				9	10	11	12	13	14
Sample Name				SWD1	SWD4	SWD2	SWD5	SWD3	DUP2
Sample Matrix				Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date				13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics (continued)									
Thallium (total)	µg/L	0.005	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Tin (total)	µg/L	0.06		0.124	0.108	0.229	0.168	0.07900	0.139
Titanium (total)	µg/L	0.1		1	1	1	4	2	3
Tungsten (total)	µg/L	0.2	30	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Uranium (total)	µg/L	0.002	5	0.56	0.60	0.62	0.61	0.61	0.60
Vanadium (total)	µg/L	0.01	6	0.5	0.6	0.6	0.8	0.6	0.7
Zirconium (total)	µg/L	2	4	< 2	< 2	< 2	< 2	< 2	< 2
Zinc (total)	µg/L	2	20	4	3	3	5	6	6
Other (ORP)									
pH	No unit	0.05	8.6	8.16	7.94	8.15	7.94	7.97	8.17
Chloride	mg/L	0.2		320	300	300	300	270	360
Mercury (dissolved)	µg/L	0.01	0.2	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Acenaphthene	µg/L	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	µg/L	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	µg/L	0.1	0.0008	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	µg/L	0.1	0.0004	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	µg/L	0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b+j)fluoranthene	µg/L	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	µg/L	0.2	0.00002	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzo(k)fluoranthene	µg/L	0.1	0.0002	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

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Samplers: Serena and Nicole

MATRIX: WATER

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

	Sample Number			9	10	11	12	13	14		
	Sample Name			SWD1	SWD4	SWD2	SWD5	SWD3	DUP2		
	Sample Matrix			Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water		
	Sample Date			13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**		
PAHs (continued)											
Chrysene	µg/L	0.1	0.0001	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Dibenzo(a,h)anthracene	µg/L	0.1	0.002	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Fluoranthene	µg/L	0.1	0.0008	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Fluorene	µg/L	0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Indeno(1,2,3-cd)pyrene	µg/L	0.2		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2		
1-Methylnaphthalene	µg/L	0.5	2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
2-Methylnaphthalene	µg/L	0.5	2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Methylnaphthalene, 2-(1-)	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Naphthalene	µg/L	0.5	7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Phenanthrene	µg/L	0.1	0.03	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Pyrene	µg/L	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
PHCs											
F1 (C6-C10)	µg/L	25		< 25	< 25	< 25	< 25	< 25	< 25		
F1-BTEX (C6-C10)	µg/L	25		< 25	< 25	< 25	< 25	< 25	< 25		
F2 (C10-C16)	µg/L	100		< 100	< 100	< 100	< 100	< 100	< 100		
F3 (C16-C34)	µg/L	200		< 200	< 200	< 200	< 200	< 200	< 200		
F4 (C34-C50)	µg/L	200		< 200	< 200	< 200	< 200	< 200	< 200		
Chromatogram returned to baseline at nC50	Yes / No	no		YES	YES	YES	YES	YES	YES		

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L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number				9	10	11	12	13	14
Sample Name				SWD1	SWD4	SWD2	SWD5	SWD3	DUP2
Sample Matrix				Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date				13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
SVOC Surrogates									
Surr 2-Methylnaphthalene-D10	Surr Rec %	no		79	81	75	78	75	73
Surr Fluoranthene-D10	Surr Rec %	no		97	97	93	95	94	93
Surr 2-Fluorobiphenyl	Surr Rec %	no		81	82	77	80	76	74
Surr 4-Terphenyl-d14	Surr Rec %	no		109	106	103	104	104	102
THMs (VOC)									
Bromodichloromethane	µg/L	0.5	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	µg/L	0.5	60	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	µg/L	0.5	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
VOC Surrogates									
Surr 1,2-Dichloroethane-d4	Surr Rec %	no		102	103	103	102	104	103
Surr 2-Bromo-1-Chloropropane	Surr Rec %	no		102	100	104	102	100	97
Surr 4-Bromofluorobenzene	Surr Rec %	no		93	91	100	98	98	92
VOCs									
Acetone	µg/L	30		< 30	< 30	< 30	< 30	< 30	< 30
Bromomethane	µg/L	0.5	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon tetrachloride	µg/L	0.2		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	15	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2.0		< 2	< 2	< 2	< 2	< 2	< 2

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L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number				9	10	11	12	13	14
Sample Name				SWD1	SWD4	SWD2	SWD5	SWD3	DUP2
Sample Matrix				Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date				13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
VOCs (continued)									
1,1-Dichloroethane	µg/L	0.5	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	µg/L	0.5	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethylene	µg/L	0.5	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethene	µg/L	0.5	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,2-Dichloroethene	µg/L	0.5	200	3.4	4.4	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	0.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,3-Dichloropropene	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropropene	µg/L	0.5	7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,3-dichloropropene (total)	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylenedibromide	µg/L	0.2	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
n-Hexane	µg/L	1.0		< 1	< 1	< 1	< 1	< 1	< 1
Methyl ethyl ketone	µg/L	20	400	< 20	< 20	< 20	< 20	< 20	< 20
Methyl Isobutyl Ketone	µg/L	20		< 20	< 20	< 20	< 20	< 20	< 20
Methyl-t-butyl Ether	µg/L	2.0	200	< 2	< 2	< 2	< 2	< 2	< 2
Methylene Chloride	µg/L	0.5	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	µg/L	0.5	4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethylene (perchloroethylene)	µg/L	0.5	50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	70	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	10	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	800	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	20	3.5	4.9	0.7	0.5	< 0.5	0.7

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L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

	Sample Number			9	10	11	12	13	14
	Sample Name			SWD1	SWD4	SWD2	SWD5	SWD3	DUP2
	Sample Matrix			Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
	Sample Date			13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
VOCs (continued)									
Trichlorofluoromethane	µg/L	5.0		< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	µg/L	0.2	600	0.3	0.5	< 0.2	< 0.2	< 0.2	< 0.2
Chloroform	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E L1
SWD1				
Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03
Iron	SM 3030/EPA 200.8	µg/L	907	300
Phosphorus	SM 3030/EPA 200.8	µg/L	36	10
SWD4				
Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03
Iron	SM 3030/EPA 200.8	µg/L	929	300
Phosphorus	SM 3030/EPA 200.8	µg/L	34	10
SWD2				
Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03
Iron	SM 3030/EPA 200.8	µg/L	893	300
Phosphorus	SM 3030/EPA 200.8	µg/L	39	10
SWD5				
Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E L1
SWD5 (continued)				
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03
Iron	SM 3030/EPA 200.8	µg/L	919	300
Phosphorus	SM 3030/EPA 200.8	µg/L	40	10
SWD3				
Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03
Iron	SM 3030/EPA 200.8	µg/L	620	300
Phosphorus	SM 3030/EPA 200.8	µg/L	33	10
DUP2				
Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03
Iron	SM 3030/EPA 200.8	µg/L	885	300
Phosphorus	SM 3030/EPA 200.8	µg/L	43	10

QC SUMMARY

Alkalinity

Method: SM 2320 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0333-SEP24	mg/L as CaCO3	2	< 2	1	20	102	80	120	NA		
Alkalinity	EWL0334-SEP24	mg/L as CaCO3	2	< 2	4	20	96	80	120	NA		

Ammonia by SFA

Method: SM 4500 I Internal ref.: ME-CA-IENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0172-SEP24	as N mg/L	0.1	<0.1	ND	10	100	90	110	101	75	125

QC SUMMARY

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0332-SEP24	mg/L	0.2	<0.2	ND	20	99	90	110	102	75	125
Sulphate	DIO0332-SEP24	mg/L	0.2	<0.2	ND	20	90	90	110	91	75	125
Chloride	DIO0334-SEP24	mg/L	0.2	<0.2	1	20	102	90	110	75	75	125
Sulphate	DIO0334-SEP24	mg/L	0.2	<0.2	8	20	94	90	110	91	75	125
Sulphate	DIO0364-SEP24	mg/L	0.2	<0.2	1	20	92	90	110	87	75	125
Chloride	DIO0395-SEP24	mg/L	0.2	<0.2	4	20	102	90	110	80	75	125
Sulphate	DIO0395-SEP24	mg/L	0.2	<0.2	2	20	94	90	110	98	75	125

Conductivity

Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0333-SEP24	uS/cm	2	< 2	1	20	99	90	110	NA		
Conductivity	EWL0334-SEP24	uS/cm	2	< 2	0	20	99	90	110	NA		

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-[ENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (dissolved)	EHG0028-SEP24	mg/L	0.01	< 0.00001	ND	20	118	80	120	130	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0165-SEP24	mg/L	0.05	<0.00005	ND	20	96	90	110	74	70	130
Aluminum (total)	EMS0165-SEP24	mg/L	1	<0.001	7	20	107	90	110	108	70	130
Aluminum (0.2µm)	EMS0165-SEP24	mg/L	1	<0.001	7	20	107	90	110	108	70	130
Arsenic (total)	EMS0165-SEP24	mg/L	0.2	<0.0002	ND	20	99	90	110	114	70	130
Barium (total)	EMS0165-SEP24	mg/L	0.08	<0.00008	12	20	99	90	110	104	70	130
Beryllium (total)	EMS0165-SEP24	mg/L	0.007	<0.000007	ND	20	96	90	110	98	70	130
Boron (total)	EMS0165-SEP24	mg/L	2	<0.002	1	20	98	90	110	93	70	130
Bismuth (total)	EMS0165-SEP24	mg/L	0.01	<0.00001	ND	20	100	90	110	91	70	130
Calcium (total)	EMS0165-SEP24	mg/L	10	<0.01	7	20	102	90	110	100	70	130
Cadmium (total)	EMS0165-SEP24	mg/L	0.003	<0.000003	11	20	102	90	110	102	70	130
Cobalt (total)	EMS0165-SEP24	mg/L	0.004	<0.000004	4	20	98	90	110	100	70	130
Chromium (total)	EMS0165-SEP24	mg/L	0.08	<0.00008	10	20	103	90	110	100	70	130
Copper (total)	EMS0165-SEP24	mg/L	1	<0.001	1	20	100	90	110	100	70	130
Iron (total)	EMS0165-SEP24	mg/L	7	<0.007	0	20	102	90	110	100	70	130
Potassium (total)	EMS0165-SEP24	mg/L	9	<0.009	4	20	106	90	110	109	70	130
Lithium (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	13	20	97	90	110	105	70	130
Magnesium (total)	EMS0165-SEP24	mg/L	1	<0.001	7	20	107	90	110	129	70	130
Manganese (total)	EMS0165-SEP24	mg/L	0.01	<0.00001	6	20	100	90	110	103	70	130
Molybdenum (total)	EMS0165-SEP24	mg/L	0.4	<0.0004	17	20	103	90	110	110	70	130
Sodium (total)	EMS0165-SEP24	mg/L	10	<0.01	7	20	100	90	110	99	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nickel (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	7	20	103	90	110	106	70	130
Lead (total)	EMS0165-SEP24	mg/L	0.09	<0.00009	10	20	96	90	110	93	70	130
Phosphorus (total)	EMS0165-SEP24	mg/L	3	<0.003	0	20	101	90	110	NV	70	130
Antimony (total)	EMS0165-SEP24	mg/L	0.9	<0.0009	ND	20	101	90	110	108	70	130
Selenium (total)	EMS0165-SEP24	mg/L	0.04	<0.00004	3	20	100	90	110	114	70	130
Silicon (total)	EMS0165-SEP24	mg/L	20	<0.02	5	20	99	90	110	NV	70	130
Tin (total)	EMS0165-SEP24	mg/L	0.06	<0.00006	4	20	102	90	110	NV	70	130
Strontium (total)	EMS0165-SEP24	mg/L	0.08	<0.00008	5	20	101	90	110	98	70	130
Tellurium (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	ND	20	101	90	110	NV	70	130
Titanium (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	3	20	101	90	110	NV	70	130
Thallium (total)	EMS0165-SEP24	mg/L	0.005	<0.000005	ND	20	99	90	110	94	70	130
Uranium (total)	EMS0165-SEP24	mg/L	0.002	<0.000002	9	20	100	90	110	97	70	130
Vanadium (total)	EMS0165-SEP24	mg/L	0.01	<0.00001	7	20	100	90	110	109	70	130
Tungsten (total)	EMS0165-SEP24	mg/L	0.2	<0.0002	ND	20	100	90	110	NV	70	130
Zinc (total)	EMS0165-SEP24	mg/L	2	<0.002	4	20	99	90	110	106	70	130
Zirconium (total)	EMS0165-SEP24	mg/L	2	<0.002	ND	20	103	90	110	NV	70	130

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
F1 (C6-C10)	GCM0268-SEP24	µg/L	25	<25	ND	30	98	60	140	109	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
F2 (C10-C16)	GCM0264-SEP24	µg/L	100	<100	ND	30	91	60	140	98	60	140
F3 (C16-C34)	GCM0264-SEP24	µg/L	200	<200	ND	30	91	60	140	98	60	140
F4 (C34-C50)	GCM0264-SEP24	µg/L	200	<200	ND	30	91	60	140	98	60	140

QC SUMMARY

pH

Method: SM 4500 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0333-SEP24	No unit	0.05	NA	0		100			NA		
pH	EWL0334-SEP24	No unit	0.05	NA	0		100			NA		

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1-Methylnaphthalene	GCM0231-SEP24	ug/L	0.5	< 0.5	ND	30	104	50	140	98	50	140
2-Methylnaphthalene	GCM0231-SEP24	µg/L	0.5	< 0.5	ND	30	103	50	140	98	50	140
Acenaphthene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	96	50	140	101	50	140
Acenaphthylene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	89	50	140	94	50	140
Anthracene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	105	50	140	97	50	140
Benzo(a)anthracene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	97	50	140	101	50	140
Benzo(a)pyrene	GCM0231-SEP24	ug/L	0.01	< 0.01	ND	30	107	50	140	106	50	140
Benzo(b+j)fluoranthene	GCM0231-SEP24	ug/L	0.1	< 0.1	ND	30	111	50	140	110	50	140
Benzo(ghi)perylene	GCM0231-SEP24	µg/L	0.2	< 0.2	ND	30	108	50	140	97	50	140
Benzo(k)fluoranthene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	112	50	140	112	50	140
Chrysene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	99	50	140	100	50	140
Dibenzo(a,h)anthracene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	109	50	140	102	50	140
Fluoranthene	GCM0231-SEP24	ug/L	0.1	< 0.1	ND	30	91	50	140	96	50	140
Fluorene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	100	50	140	96	50	140
Indeno(1,2,3-cd)pyrene	GCM0231-SEP24	µg/L	0.2	< 0.2	ND	30	109	50	140	95	50	140
Naphthalene	GCM0231-SEP24	µg/L	0.5	< 0.5	ND	30	103	50	140	93	50	140
Phenanthrene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	108	50	140	100	50	140
Pyrene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	95	50	140	98	50	140

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,1,2-Tetrachloroethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	110	60	130	117	50	140
1,1,1-Trichloroethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	109	50	140
1,1,2,2-Tetrachloroethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	113	60	130	117	50	140
1,1,2-Trichloroethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	115	60	130	117	50	140
1,1-Dichloroethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	114	60	130	114	50	140
1,1-Dichloroethylene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	118	60	130	111	50	140
1,2-Dichlorobenzene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	116	50	140
1,2-Dichloroethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	115	60	130	111	50	140
1,2-Dichloropropane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	115	60	130	115	50	140
1,3-Dichlorobenzene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	109	60	130	115	50	140
1,4-Dichlorobenzene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	116	50	140
Acetone	GCM0275-SEP24	ug/L	30	<30	ND	30	107	50	140	105	50	140
Benzene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	116	60	130	112	50	140
Bromodichloromethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	112	50	140
Bromoform	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	107	60	130	111	50	140
Bromomethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	104	50	140	102	50	140
Carbon tetrachloride	GCM0275-SEP24	µg/L	0.2	<0.2	ND	30	110	60	130	112	50	140
Chlorobenzene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	112	60	130	116	50	140
Chloroform	GCM0275-SEP24	ug/L	0.5	<0.5	ND	30	113	60	130	113	50	140
cis-1,2-Dichloroethene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	115	60	130	113	50	140

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
cis-1,3-Dichloropropene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	110	60	130	108	50	140
Dibromochloromethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	112	60	130	113	50	140
Dichlorodifluoromethane	GCM0275-SEP24	µg/L	2.0	<2	ND	30	84	50	140	82	50	140
Ethylbenzene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	112	60	130	117	50	140
Ethylenedibromide	GCM0275-SEP24	µg/L	0.2	<0.2	ND	30	114	60	130	109	50	140
n-Hexane	GCM0275-SEP24	µg/L	1.0	<1	ND	30	99	60	130	98	50	140
m/p-xylene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	110	60	130	117	50	140
Methyl ethyl ketone	GCM0275-SEP24	ug/L	20	<20	ND	30	112	60	130	104	50	140
Methyl Isobutyl Ketone	GCM0275-SEP24	µg/L	20	<20	ND	30	107	50	140	104	50	140
Methyl-t-butyl Ether	GCM0275-SEP24	µg/L	2.0	<2	ND	30	96	60	130	93	50	140
Methylene Chloride	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	113	60	130	110	50	140
o-xylene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	110	60	130	114	50	140
Styrene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	117	50	140
Tetrachloroethylene (perchloroethylene)	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	110	60	130	111	50	140
Toluene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	112	60	130	115	50	140
trans-1,2-Dichloroethene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	111	50	140
trans-1,3-Dichloropropene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	115	50	140
Trichloroethylene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	110	60	130	111	50	140
Trichlorofluoromethane	GCM0275-SEP24	µg/L	5.0	<5	ND	30	117	50	140	114	50	140
Vinyl Chloride	GCM0275-SEP24	µg/L	0.2	<0.2	ND	30	105	50	140	109	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.
Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.
LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.
Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.
RL: Reporting limit
RPD: Relative percent difference
AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.
Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.
Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS	Insufficient sample for analysis.
RL	Reporting Limit.
↑	Reporting limit raised.
↓	Reporting limit lowered.
NA	The sample was not analysed for this analyte
ND	Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 036464 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Ari Goodmer
Received Date: 09/13/24 (mm/dd/yy)
Received Time: 15:30 (hr : min)
Received By (signature): Ari
Custody Seal Present: Yes ✓ No
Custody Seal Intact: Yes ✓ No
Cooling Agent Present: Yes ✓ No Type: ice
Temperature Upon Receipt (°C) 15 x3
CA-14537-Sep24 NP
LAB LIMS #:

REPORT INFORMATION

Company: WSP Canada Inc.
Contact: Christi Groves/Dawn
Address: 121 Commerce Park Drive Unit L Barrie
Phone:
Fax:
Email: christi.groves@wsp.com; Dawn.hoyle@wsp.com

INVOICE INFORMATION

X (same as Report Information)
Company:
Contact:
Address:
Phone:
Email:

Quotation #: 2023 451
Project #: CA-GUD-2359540
P.O. #:
Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

X Regular TAT (5-7days)
TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day
RUSH TAT (Additional Charges May Apply): 1 Day 2 Days 3 Days 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION
Specify Due Date:
*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

O.Reg 153/04 O.Reg 406/19
Table 1 Res/Park Soil Texture:
Table 2 Ind/Com Coarse
Table 3 Agri/Other Medium/Fine
Table Appx.
Soil Volume <350m3 >350m3

Other Regulations:
Reg 347/558 (3 Day min TAT)
X PWQO MMER
CCME Other:
MISA
ODWS Not Reportable *See note

Sewer By-Law:
Sanitary
Storm
Municipality:

RECORD OF SITE CONDITION (RSC) X YES NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	SWD1	9.13.24	12:20	15	water
2	SWD4		12:40		
3	SWD2				
4	SWD5		1:15		
5	SWD3				
6	DUP 2				
7					
8					
9					
10					
11					
12					

	M & I: Field Filtered (Y/N)	M & I: Metals & Inorganics (incl CrVI, CN, Hg pH,(B(HWS),EC,SAR-soil) (Cl, Na-water)	M & I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI	M & I: ICP Metals only (Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Tl,U,V,Zn	SVOC: PAHs only	SVOC: SVOCs (all incl PAHs, ABNs, CPs	PCB: PCBs Total Aroclor	PHC: F1-F4 + BTEX	PHC: F1-F4 only (no BTEX	VOC: VOCs (all incl BTEX	VOC: BTEX only	Pest: Pesticides (Organochlorine or specify other	Other: major ions	Other: indicators	Other	Other	Other: Sewer Use: (Specify pkg:	Other: Water Characterization Pkg (General / Extended)	SPLP: Specify tests (Metals, VOC, 1,4-Dioxane, OCP, ABN)	TCLP: Specify tests (M&I, VOC, PCB, B(a)P, ABN, Ignit.)	COMMENTS:
1			X		X			X	X	X			X	X							
2			X		X			X	X	X			X	X							
3			X		X			X	X	X			X	X							
4			X		X			X	X	X			X	X							
5			X		X			X	X	X			X	X							
6			X		X			X	X	X			X	X							

Observations/Comments/Special Instructions

Sampled By (NAME): Serena and Nicole
Signature: Serena Hoyle
Date: 9/13/24 (mm/dd/yy)

Relinquished by (NAME):
Signature:
Date: / / (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.7
Date of Issue: 07 JUNE 2023

FINAL REPORT

CA14539-SEP24 R1

C A-GLD-23592540

Prepared for

WSP Canada Inc.

FINAL REPORT

First Page

CLIENT DETAILS

Client	WSP Canada Inc.
Address	121 Commerce Park Dr, Unit L Barrie, ON L4N 8X1. Canada
Contact	Christi Groves
Telephone	705-718-1446
Facsimile	
Email	christi.groves@wsp.com
Project	C A-GLD-23592540
Order Number	
Samples	Surface Water (2)

LABORATORY DETAILS

Project Specialist	Brad Moore Hon. B.Sc
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2143
Facsimile	705-652-6365
Email	brad.moore@sgs.com
SGS Reference	CA14539-SEP24
Received	09/16/2024
Approved	09/23/2024
Report Number	CA14539-SEP24 R1
Date Reported	09/25/2024

COMMENTS

Revision 1 - Metals reported as ug/L

SIGNATORIES

Brad Moore Hon. B.Sc

TABLE OF CONTENTS

Client: WSP Canada Inc.
Project: C A-GLD-23592540
Project Manager: Christi Groves
Samplers: NA

MATRIX: WATER

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

Parameter	Units	RL	L1	Result	Result
BTEX					
Benzene	µg/L	0.5	100	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	8	< 0.5	< 0.5
Toluene	µg/L	0.5	0.8	< 0.5	< 0.5
Xylene (total)	µg/L	0.5		< 0.5	< 0.5
m/p-xylene	µg/L	0.5	2	< 0.5	< 0.5
o-xylene	µg/L	0.5	40	< 0.5	< 0.5
General Chemistry					
Alkalinity	mg/L as CaCO3	2		3	---
Temperature @ pH	°C	0		20.7	---
Conductivity	uS/cm	2		4	---
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1	---
Unionized Ammonia	mg/L as N	0.001	0.02	< 0.001	---
Metals and Inorganics					
Sulphate	mg/L	0.2		< 0.2	---
Hardness	µg/L	50		< 50	---
Calcium (total)	µg/L	10		< 10	---
Iron (total)	µg/L	7	300	< 7	---
Potassium (total)	µg/L	9		< 9	---
Magnesium (total)	µg/L	1		1	---
Sodium (total)	µg/L	10		< 10	---
Aluminum (total)	µg/L	1		< 1	---

Client: WSP Canada Inc.
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Samplers: NA

MATRIX: WATER

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

Metals and Inorganics (continued)

Parameter	Units	RL	L1	Result	Result
Aluminum (0.2µm)	µg/L	1	75	14	---
Antimony (total)	µg/L	0.9	20	< 0.9	---
Arsenic (total)	µg/L	0.2	5	< 0.2	---
Barium (total)	µg/L	0.08		< 0.08	---
Beryllium (total)	µg/L	0.007	11	< 0.007	---
Boron (total)	µg/L	2	200	< 2	---
Cadmium (total)	µg/L	0.003	0.1	< 0.003	---
Cobalt (total)	µg/L	0.004	0.9	< 0.004	---
Chromium (total)	µg/L	0.08	100	< 0.08	---
Copper (total)	µg/L	1	5	< 1	---
Manganese (total)	µg/L	0.01		< 0.01	---
Molybdenum (total)	µg/L	0.4	40	< 0.4	---
Nickel (total)	µg/L	0.1	25	< 0.1	---
Phosphorus (total)	µg/L	3	10	< 3	---
Lead (total)	µg/L	0.09	5	< 0.09	---
Lithium (total)	µg/L	0.1		< 0.1	---
Selenium (total)	µg/L	0.04	100	< 0.04	---
Silicon (total)	µg/L	20		< 20	---
Silver (total)	µg/L	0.05	0.1	< 0.05	---
Strontium (total)	µg/L	0.08		< 0.08	---
Tellurium (total)	µg/L	0.1		< 0.1	---
Thallium (total)	µg/L	0.005	0.3	< 0.005	---

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MATRIX: WATER

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Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

Parameter	Units	RL	L1	Result	Result
Metals and Inorganics (continued)					
Tin (total)	µg/L	0.06		< 0.06	---
Titanium (total)	µg/L	0.1		< 0.1	---
Uranium (total)	µg/L	0.002	5	< 0.002	---
Vanadium (total)	µg/L	0.01	6	< 0.01	---
Tungsten (total)	µg/L	0.2	30	< 0.2	---
Zinc (total)	µg/L	2	20	< 2	---
Zirconium (total)	µg/L	2	4	< 2	---
Other (ORP)					
pH	No unit	0.05	8.6	6.79	---
Chloride	mg/L	0.2		< 0.2	---
Mercury (dissolved)	µg/L	0.01	0.2	< 0.01	---
PAHs					
Acenaphthene	µg/L	0.1		< 0.1	---
Acenaphthylene	µg/L	0.1		< 0.1	---
Anthracene	µg/L	0.1	0.0008	< 0.1	---
Benzo(a)anthracene	µg/L	0.1	0.0004	< 0.1	---
Benzo(a)pyrene	µg/L	0.01		< 0.01	---
Benzo(b+j)fluoranthene	µg/L	0.1		< 0.1	---
Benzo(ghi)perylene	µg/L	0.2	0.00002	< 0.2	---
Benzo(k)fluoranthene	µg/L	0.1	0.0002	< 0.1	---
Chrysene	µg/L	0.1	0.0001	< 0.1	---

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MATRIX: WATER

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

Parameter	Units	RL	L1	Result	Result
PAHs (continued)					
Dibenzo(a,h)anthracene	µg/L	0.1	0.002	< 0.1	---
Fluoranthene	µg/L	0.1	0.0008	< 0.1	---
Fluorene	µg/L	0.1	0.2	< 0.1	---
Indeno(1,2,3-cd)pyrene	µg/L	0.2		< 0.2	---
1-Methylnaphthalene	µg/L	0.5	2	< 0.5	---
2-Methylnaphthalene	µg/L	0.5	2	< 0.5	---
Methylnaphthalene, 2-(1-)	µg/L	0.5		< 0.5	---
Naphthalene	µg/L	0.5	7	< 0.5	---
Phenanthrene	µg/L	0.1	0.03	< 0.1	---
Pyrene	µg/L	0.1		< 0.1	---
PHCs					
F1 (C6-C10)	µg/L	25		< 25	< 25
F1-BTEX (C6-C10)	µg/L	25		< 25	< 25
F2 (C10-C16)	µg/L	100		< 100	---
F3 (C16-C34)	µg/L	200		< 200	---
F4 (C34-C50)	µg/L	200		< 200	---
Chromatogram returned to baseline at nC50	Yes / No	no		YES	---

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MATRIX: WATER

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Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

Parameter	Units	RL	L1	Result	Result
SVOC Surrogates					
Surr 2-Methylnaphthalene-D10	Surr Rec %	no		60	---
Surr Fluoranthene-D10	Surr Rec %	no		93	---
Surr 2-Fluorobiphenyl	Surr Rec %	no		61	---
Surr 4-Terphenyl-d14	Surr Rec %	no		110	---
THMs (VOC)					
Bromodichloromethane	µg/L	0.5	200	< 0.5	< 0.5
Bromoform	µg/L	0.5	60	< 0.5	< 0.5
Dibromochloromethane	µg/L	0.5	40	< 0.5	< 0.5
VOC Surrogates					
Surr 1,2-Dichloroethane-d4	Surr Rec %	no		101	97
Surr 2-Bromo-1-Chloropropane	Surr Rec %	no		93	95
Surr 4-Bromofluorobenzene	Surr Rec %	no		97	91
VOCs					
Acetone	µg/L	30		< 30	< 30
Bromomethane	µg/L	0.5	0.9	< 0.5	< 0.5
Carbon tetrachloride	µg/L	0.2		< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	15	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	4	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2.0		< 2	< 2

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Samplers: NA

MATRIX: WATER

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

Parameter	Units	RL	L1	Result	Result
VOCs (continued)					
1,1-Dichloroethane	µg/L	0.5	100	< 0.5	< 0.5
1,2-Dichloroethane	µg/L	0.5	100	< 0.5	< 0.5
1,1-Dichloroethylene	µg/L	0.5	40	< 0.5	< 0.5
trans-1,2-Dichloroethene	µg/L	0.5	200	< 0.5	< 0.5
cis-1,2-Dichloroethene	µg/L	0.5	200	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	0.7	< 0.5	< 0.5
cis-1,3-Dichloropropene	µg/L	0.5		< 0.5	< 0.5
trans-1,3-Dichloropropene	µg/L	0.5	7	< 0.5	< 0.5
1,3-dichloropropene (total)	µg/L	0.5		< 0.5	< 0.5
Ethylenedibromide	µg/L	0.2	5	< 0.2	< 0.2
n-Hexane	µg/L	1.0		< 1	< 1
Methyl ethyl ketone	µg/L	20	400	< 20	< 20
Methyl Isobutyl Ketone	µg/L	20		< 20	< 20
Methyl-t-butyl Ether	µg/L	2.0	200	< 2	< 2
Methylene Chloride	µg/L	0.5	100	< 0.5	< 0.5
Styrene	µg/L	0.5	4	< 0.5	< 0.5
Tetrachloroethylene (perchloroethylene)	µg/L	0.5	50	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	20	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	70	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	10	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	800	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	20	< 0.5	< 0.5

Client: WSP Canada Inc.
Project: C A-GLD-23592540
Project Manager: Christi Groves
Samplers: NA

MATRIX: WATER

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

Parameter	Units	RL	L1	Result	Result
VOCs (continued)					
Trichlorofluoromethane	µg/L	5.0		< 5	< 5
Vinyl Chloride	µg/L	0.2	600	< 0.2	< 0.2
Chloroform	µg/L	0.5		< 0.5	< 0.5

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E L1
Field Blank				
Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03

QC SUMMARY

Alkalinity

Method: SM 2320 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0333-SEP24	mg/L as CaCO3	2	< 2	1	20	102	80	120	NA		

Ammonia by SFA

Method: SM 4500 I Internal ref.: ME-CA-[ENV]SFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0172-SEP24	as N mg/L	0.1	<0.1	ND	10	100	90	110	101	75	125

QC SUMMARY

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0332-SEP24	mg/L	0.2	<0.2	ND	20	99	90	110	102	75	125
Sulphate	DIO0332-SEP24	mg/L	0.2	<0.2	ND	20	90	90	110	91	75	125

Conductivity

Method: SM 2510 | Internal ref.: ME-CA-[ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0353-SEP24	uS/cm	2	< 2	0	20	98	90	110	NA		

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-[ENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (dissolved)	EHG0028-SEP24	mg/L	0.01	< 0.00001	ND	20	118	80	120	130	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0165-SEP24	mg/L	0.05	<0.00005	ND	20	96	90	110	74	70	130
Aluminum (total)	EMS0165-SEP24	mg/L	1	<0.001	7	20	107	90	110	108	70	130
Arsenic (total)	EMS0165-SEP24	mg/L	0.2	<0.0002	ND	20	99	90	110	114	70	130
Barium (total)	EMS0165-SEP24	mg/L	0.08	<0.00008	12	20	99	90	110	104	70	130
Beryllium (total)	EMS0165-SEP24	mg/L	0.007	<0.000007	ND	20	96	90	110	98	70	130
Boron (total)	EMS0165-SEP24	mg/L	2	<0.002	1	20	98	90	110	93	70	130
Calcium (total)	EMS0165-SEP24	mg/L	10	<0.01	7	20	102	90	110	100	70	130
Cadmium (total)	EMS0165-SEP24	mg/L	0.003	<0.000003	11	20	102	90	110	102	70	130
Cobalt (total)	EMS0165-SEP24	mg/L	0.004	<0.000004	4	20	98	90	110	100	70	130
Chromium (total)	EMS0165-SEP24	mg/L	0.08	<0.00008	10	20	103	90	110	100	70	130
Copper (total)	EMS0165-SEP24	mg/L	1	<0.001	1	20	100	90	110	100	70	130
Iron (total)	EMS0165-SEP24	mg/L	7	<0.007	0	20	102	90	110	100	70	130
Potassium (total)	EMS0165-SEP24	mg/L	9	<0.009	4	20	106	90	110	109	70	130
Lithium (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	13	20	97	90	110	105	70	130
Magnesium (total)	EMS0165-SEP24	mg/L	1	<0.001	7	20	107	90	110	129	70	130
Manganese (total)	EMS0165-SEP24	mg/L	0.01	<0.00001	6	20	100	90	110	103	70	130
Molybdenum (total)	EMS0165-SEP24	mg/L	0.4	<0.0004	17	20	103	90	110	110	70	130
Sodium (total)	EMS0165-SEP24	mg/L	10	<0.01	7	20	100	90	110	99	70	130
Nickel (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	7	20	103	90	110	106	70	130
Lead (total)	EMS0165-SEP24	mg/L	0.09	<0.00009	10	20	96	90	110	93	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	EMS0165-SEP24	mg/L	3	<0.003	0	20	101	90	110	NV	70	130
Antimony (total)	EMS0165-SEP24	mg/L	0.9	<0.0009	ND	20	101	90	110	108	70	130
Selenium (total)	EMS0165-SEP24	mg/L	0.04	<0.00004	3	20	100	90	110	114	70	130
Silicon (total)	EMS0165-SEP24	mg/L	20	<0.02	5	20	99	90	110	NV	70	130
Tin (total)	EMS0165-SEP24	mg/L	0.06	<0.00006	4	20	102	90	110	NV	70	130
Strontium (total)	EMS0165-SEP24	mg/L	0.08	<0.00008	5	20	101	90	110	98	70	130
Tellurium (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	ND	20	101	90	110	NV	70	130
Titanium (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	3	20	101	90	110	NV	70	130
Thallium (total)	EMS0165-SEP24	mg/L	0.005	<0.000005	ND	20	99	90	110	94	70	130
Uranium (total)	EMS0165-SEP24	mg/L	0.002	<0.000002	9	20	100	90	110	97	70	130
Vanadium (total)	EMS0165-SEP24	mg/L	0.01	<0.00001	7	20	100	90	110	109	70	130
Tungsten (total)	EMS0165-SEP24	mg/L	0.2	<0.0002	ND	20	100	90	110	NV	70	130
Zinc (total)	EMS0165-SEP24	mg/L	2	<0.002	4	20	99	90	110	106	70	130
Zirconium (total)	EMS0165-SEP24	mg/L	2	<0.002	ND	20	103	90	110	NV	70	130
Aluminum (0.2µm)	EMS0213-SEP24	mg/L	1	<0.001	8	20	96	90	110	100	70	130

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
F1 (C6-C10)	GCM0232-SEP24	µg/L	25	<25	ND	30	96	60	140	107	60	140
F1 (C6-C10)	GCM0299-SEP24	µg/L	25	<25	ND	30	86	60	140	100	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
F2 (C10-C16)	GCM0214-SEP24	µg/L	100	<100	ND	30	73	60	140	86	60	140
F3 (C16-C34)	GCM0214-SEP24	µg/L	200	<200	ND	30	73	60	140	86	60	140
F4 (C34-C50)	GCM0214-SEP24	µg/L	200	<200	ND	30	73	60	140	86	60	140

QC SUMMARY

pH

Method: SM 4500 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0333-SEP24	No unit	0.05	NA	0		100			NA		

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1-Methylnaphthalene	GCM0259-SEP24	ug/L	0.5	< 0.5	ND	30	94	50	140	84	50	140
2-Methylnaphthalene	GCM0259-SEP24	µg/L	0.5	< 0.5	ND	30	96	50	140	85	50	140
Acenaphthene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	93	50	140	87	50	140
Acenaphthylene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	89	50	140	84	50	140
Anthracene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	93	50	140	90	50	140
Benzo(a)anthracene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	92	50	140	90	50	140
Benzo(a)pyrene	GCM0259-SEP24	ug/L	0.01	< 0.01	ND	30	90	50	140	87	50	140
Benzo(b+j)fluoranthene	GCM0259-SEP24	ug/L	0.1	< 0.1	ND	30	92	50	140	88	50	140
Benzo(ghi)perylene	GCM0259-SEP24	µg/L	0.2	< 0.2	ND	30	93	50	140	89	50	140
Benzo(k)fluoranthene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	94	50	140	90	50	140
Chrysene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	94	50	140	90	50	140
Dibenzo(a,h)anthracene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	90	50	140	88	50	140
Fluoranthene	GCM0259-SEP24	ug/L	0.1	< 0.1	ND	30	94	50	140	93	50	140
Fluorene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	95	50	140	92	50	140
Indeno(1,2,3-cd)pyrene	GCM0259-SEP24	µg/L	0.2	< 0.2	ND	30	89	50	140	88	50	140
Naphthalene	GCM0259-SEP24	µg/L	0.5	< 0.5	ND	30	89	50	140	80	50	140
Phenanthrene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	93	50	140	90	50	140
Pyrene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	93	50	140	89	50	140

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Toluene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	94	60	130	92	50	140
1,1,1,2-Tetrachloroethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	97	60	130	92	50	140
1,1,1-Trichloroethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	92	60	130	91	50	140
1,1,2,2-Tetrachloroethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	89	60	130	90	50	140
1,1,2-Trichloroethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	97	60	130	91	50	140
1,1-Dichloroethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	100	60	130	96	50	140
1,1-Dichloroethylene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	97	60	130	92	50	140
1,2-Dichlorobenzene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	100	60	130	92	50	140
1,2-Dichloroethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	95	60	130	91	50	140
1,2-Dichloropropane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	93	60	130	89	50	140
1,3-Dichlorobenzene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	97	60	130	89	50	140
1,4-Dichlorobenzene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	98	60	130	91	50	140
Acetone	GCM0276-SEP24	ug/L	30	<30	ND	30	106	50	140	86	50	140
Benzene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	97	60	130	95	50	140
Bromodichloromethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	92	60	130	86	50	140
Bromoform	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	96	60	130	89	50	140
Bromomethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	87	50	140	83	50	140
Carbon tetrachloride	GCM0276-SEP24	µg/L	0.2	<0.2	ND	30	92	60	130	93	50	140
Chlorobenzene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	98	60	130	91	50	140
Chloroform	GCM0276-SEP24	ug/L	0.5	<0.5	ND	30	95	60	130	94	50	140

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
cis-1,2-Dichloroethene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	96	60	130	94	50	140
cis-1,3-Dichloropropene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	90	60	130	88	50	140
Dibromochloromethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	95	60	130	89	50	140
Dichlorodifluoromethane	GCM0276-SEP24	µg/L	2.0	<2	ND	30	73	50	140	74	50	140
Ethylbenzene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	96	60	130	92	50	140
Ethylenedibromide	GCM0276-SEP24	µg/L	0.2	<0.2	ND	30	93	60	130	90	50	140
n-Hexane	GCM0276-SEP24	µg/L	1.0	<1	ND	30	85	60	130	96	50	140
m/p-xylene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	96	60	130	92	50	140
Methyl ethyl ketone	GCM0276-SEP24	ug/L	20	<20	ND	30	105	60	130	87	50	140
Methyl Isobutyl Ketone	GCM0276-SEP24	µg/L	20	<20	ND	30	100	50	140	86	50	140
Methyl-t-butyl Ether	GCM0276-SEP24	µg/L	2.0	<2	ND	30	92	60	130	84	50	140
Methylene Chloride	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	95	60	130	91	50	140
o-xylene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	94	60	130	89	50	140
Styrene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	98	60	130	93	50	140
Tetrachloroethylene (perchloroethylene)	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	93	60	130	90	50	140
trans-1,2-Dichloroethene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	93	60	130	93	50	140
trans-1,3-Dichloropropene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	93	60	130	92	50	140
Trichloroethylene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	100	60	130	89	50	140
Trichlorofluoromethane	GCM0276-SEP24	µg/L	5.0	<5	ND	30	96	50	140	99	50	140
Vinyl Chloride	GCM0276-SEP24	µg/L	0.2	<0.2	ND	30	93	50	140	89	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.
Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.
LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.
Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.
RL: Reporting limit
RPD: Relative percent difference
AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.
Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.
Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS	Insufficient sample for analysis.
RL	Reporting Limit.
↑	Reporting limit raised.
↓	Reporting limit lowered.
NA	The sample was not analysed for this analyte
ND	Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 015429 Page ____ of ____

Laboratory Information Section - Lab use only

Received By: Ari Goodman
Received Date: 09/13/24 (mm/dd/yy)
Received Time: 15 : 50 (hr : min)
Received By (signature): Ari M
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☐ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ice
Temperature Upon Receipt (°C) 15.x3
CA-14539-SEP 24 NP
LAB LIMS #: _____

REPORT INFORMATION	INVOICE INFORMATION
Company: WSP Canada Inc	☐ (same as Report Information)
Contact: Christi Graves Dawn Velocci	Company:
Address: 121 Commerce Park Drive Unit L Barrie	Contact:
Phone:	Address:
Fax: christ.graves@wsp.com	Phone:
Email: Dawn.hoyle@wsp.com	Email:

Quotation #: 2023 451
Project #: CA-GLD-23592540
P.O. #: _____
Site Location/ID: _____

TURNAROUND TIME (TAT) REQUIRED

☒ Regular TAT (5-7days) — TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date: _____

NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

Regulation 153/04: ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ____ ☐ Res/Park ☐ Ind/Com ☐ Agri/Other Soil Texture: ☐ Coarse ☐ Medium ☐ Fine

Other Regulations: ☐ Reg 347/558 (3 Day min TAT) ☒ PWQO ☐ MMER ☐ CCME ☐ Other: ☐ MISA

Sewer By-Law: ☐ Sanitary ☐ Storm Municipality: _____

RECORD OF SITE CONDITION (RSC) ☒ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	M&I: Metals & Inorganics incl CrVI, CN, Hg pH,(B(HWS),EC,SAR-soil) (Cl, Na-water)	M&I: Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	M&I: ICP Metals only Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni, Se,Ag,Tl,U,V,Zn	SVOC: PAHs only	SVOC: SVOCs all incl PAHs, ABNs, CPs	PCB: PCBs Total ☐ Aroclor ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only no BTEX	VOC: VOCs all incl BTEX	VOC: BTEX only	Pest: Pesticides Organochlorine or specify other	Other: major ions	Other: indicators	Other: Sewer Use: Specify pkg:	Other: Water Characterization Pkg General ☐ Extended ☐	TCLP: Specify TCLP tests ☐M&I ☐VOC ☐PCB ☐B(a)P ☐ABN ☐Ignit.	COMMENTS:
1	Field Blank	9.13.24	10:20	15	water			X		X				X	X			X	X				
2	Trip Blank																						
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

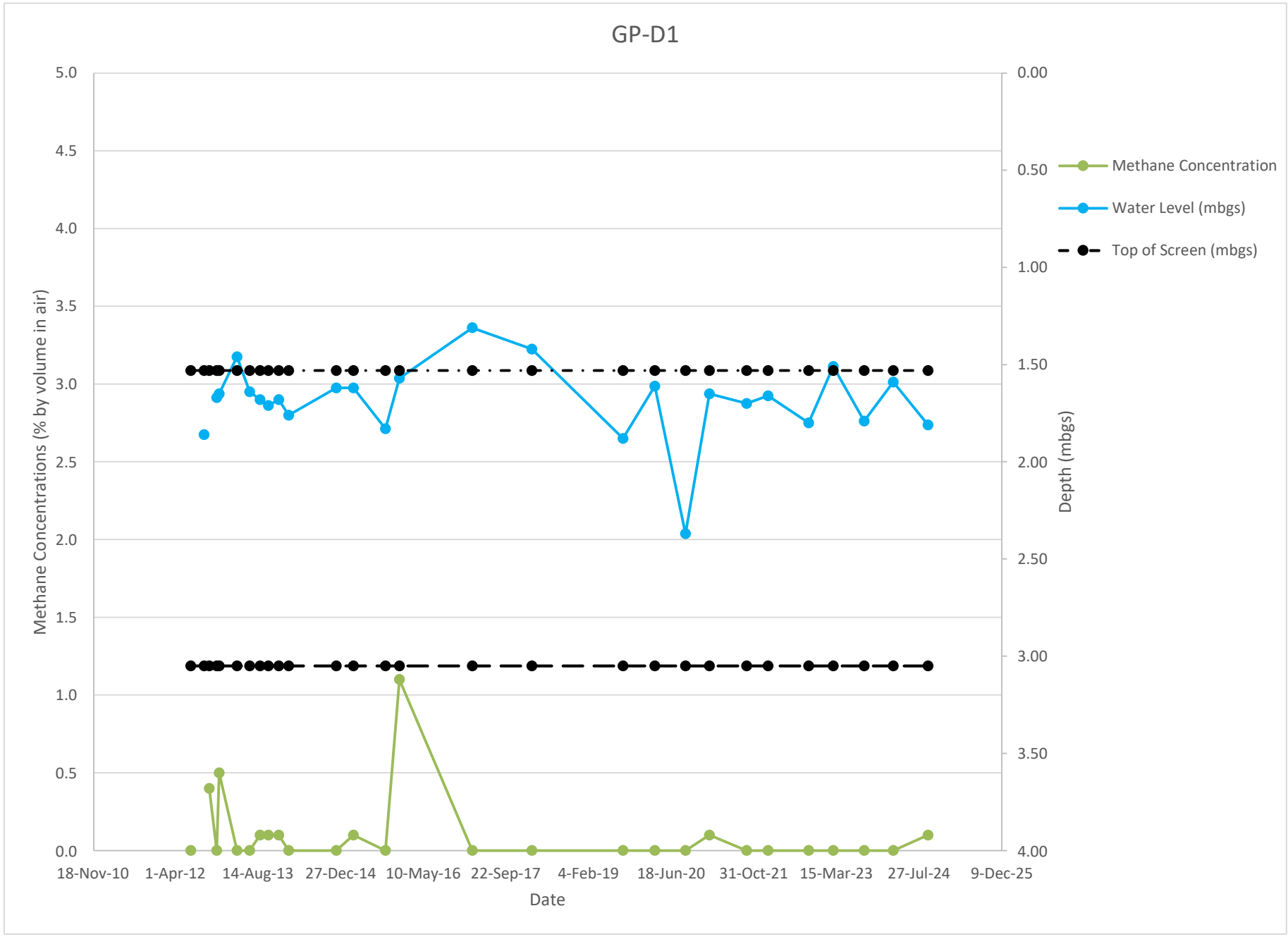
Observations/Comments/Special Instructions

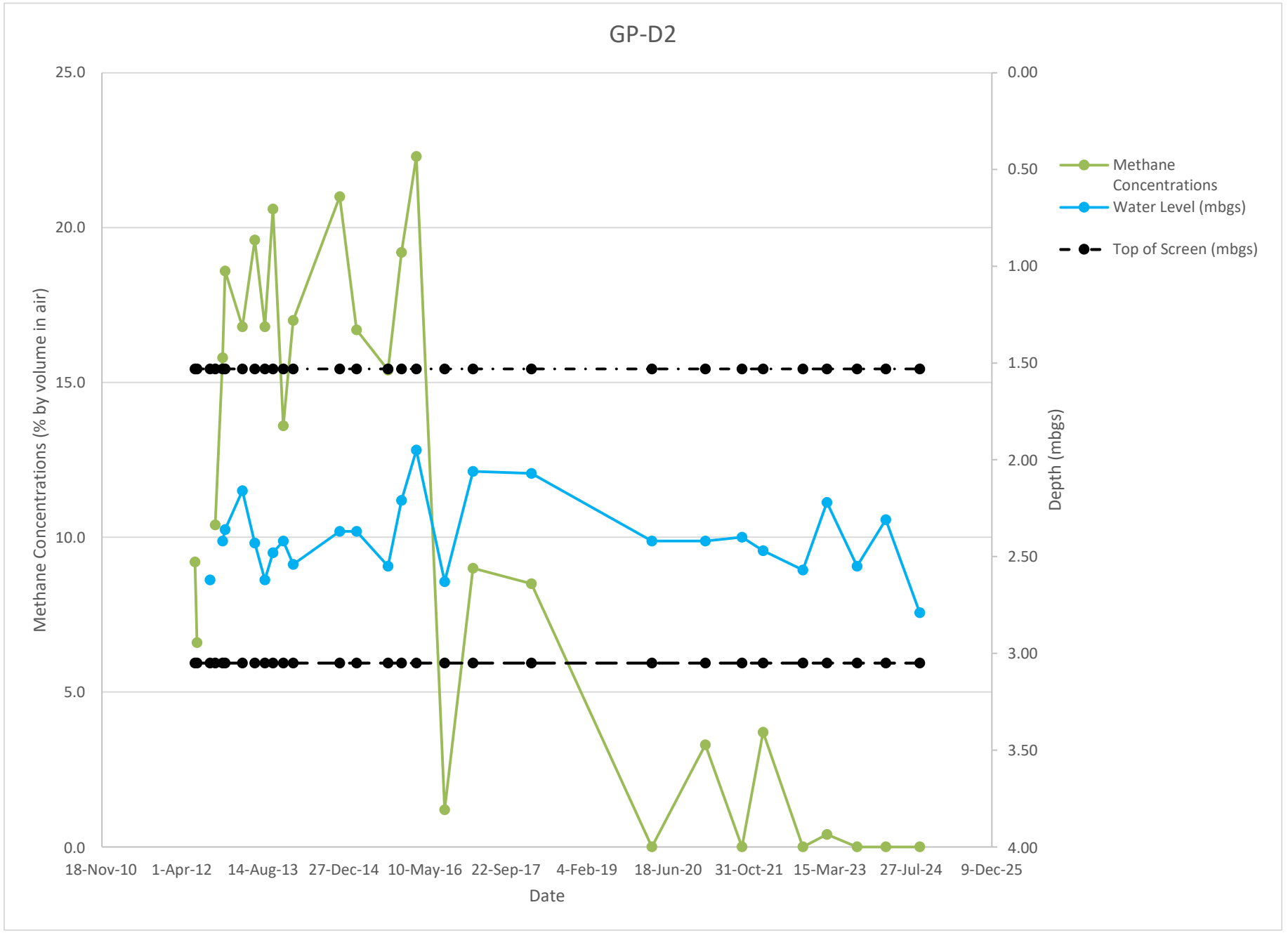
Sampled By (NAME):	**Signature:**	Date: ____/____/____ (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME):	**Signature:**	Date: ____/____/____ (mm/dd/yy)	Yellow & White Copy - SGS

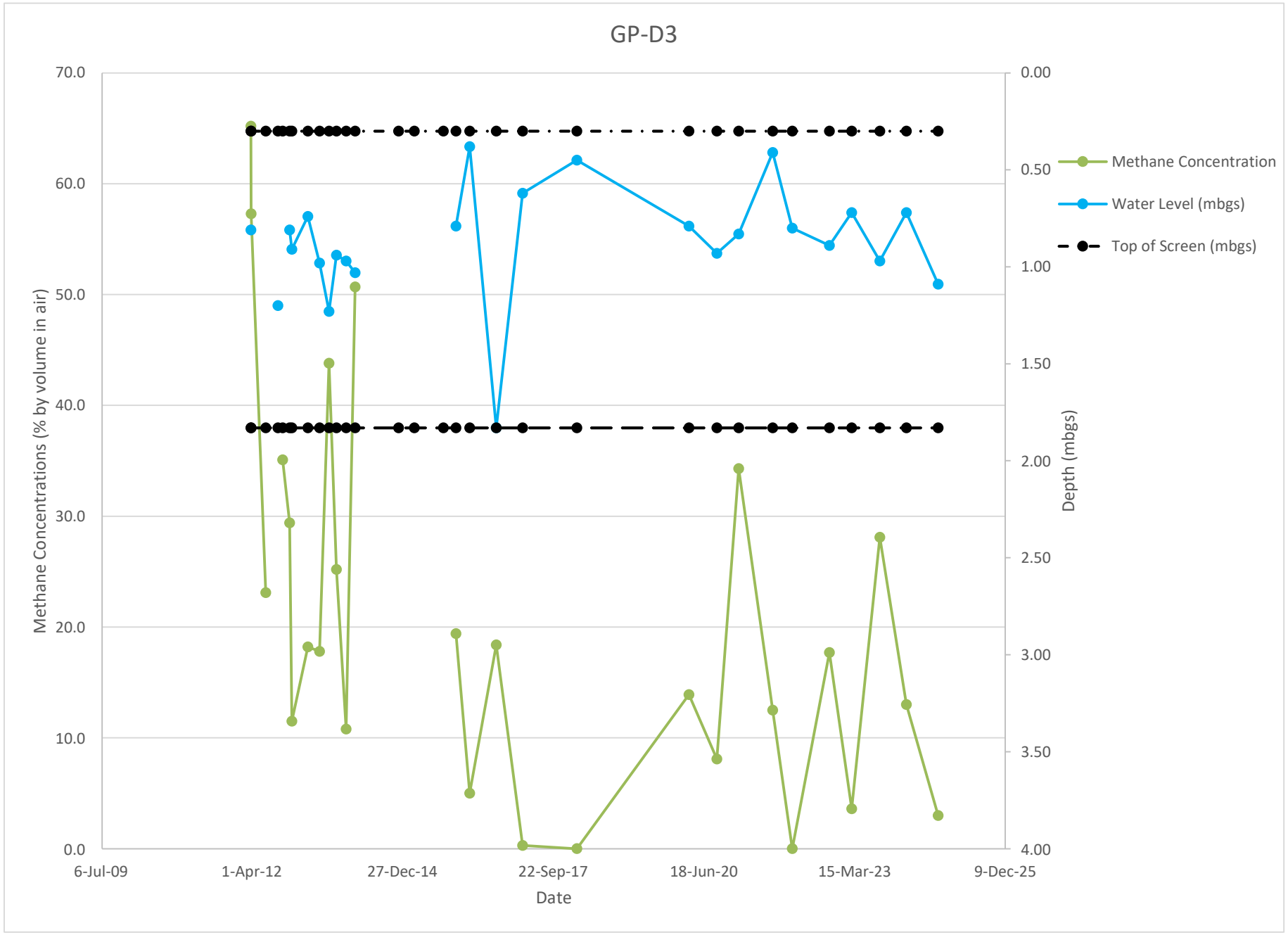
Revision #: 1.2
Date of Issue: 09 Sept, 2019

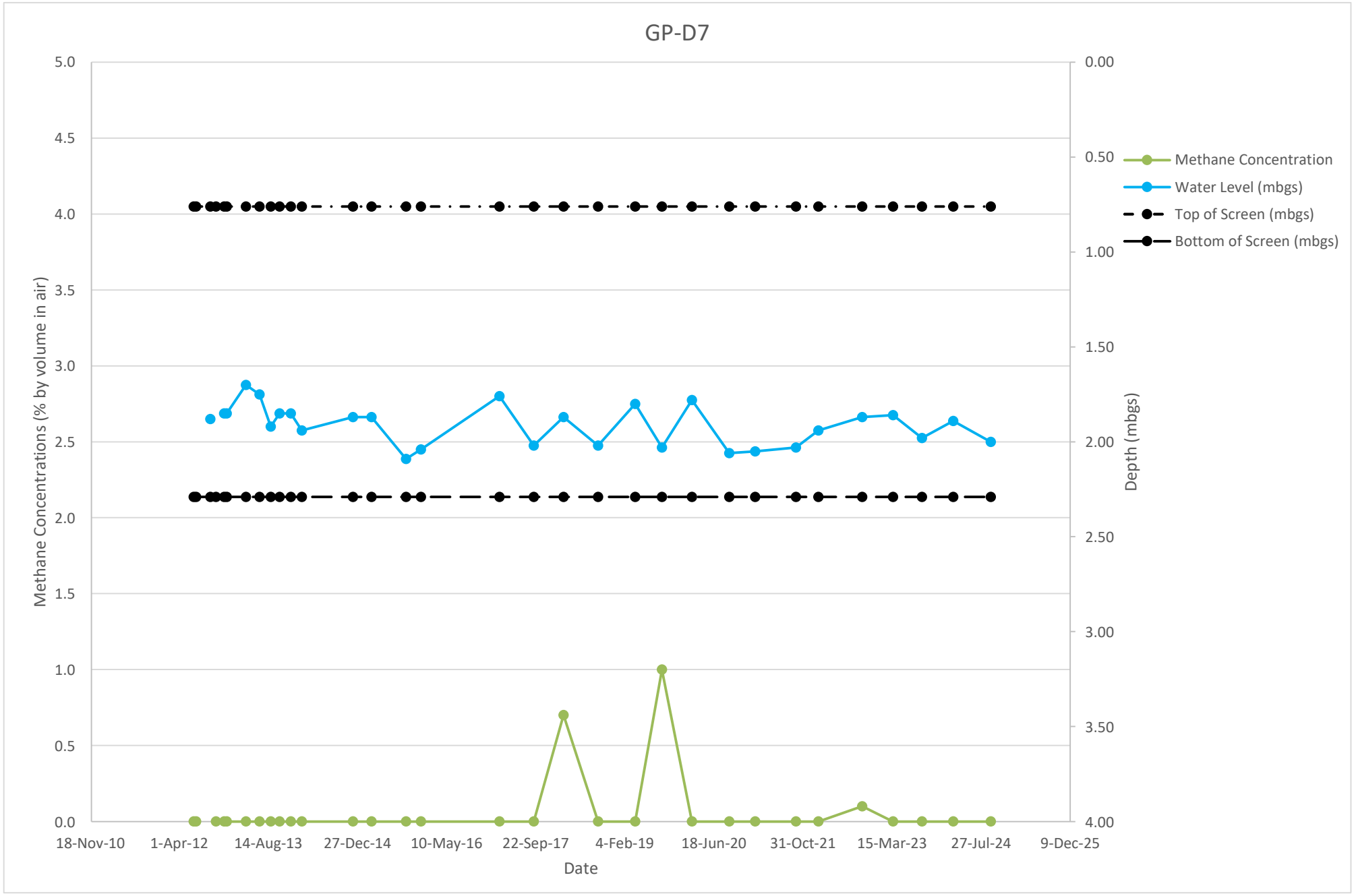
APPENDIX D

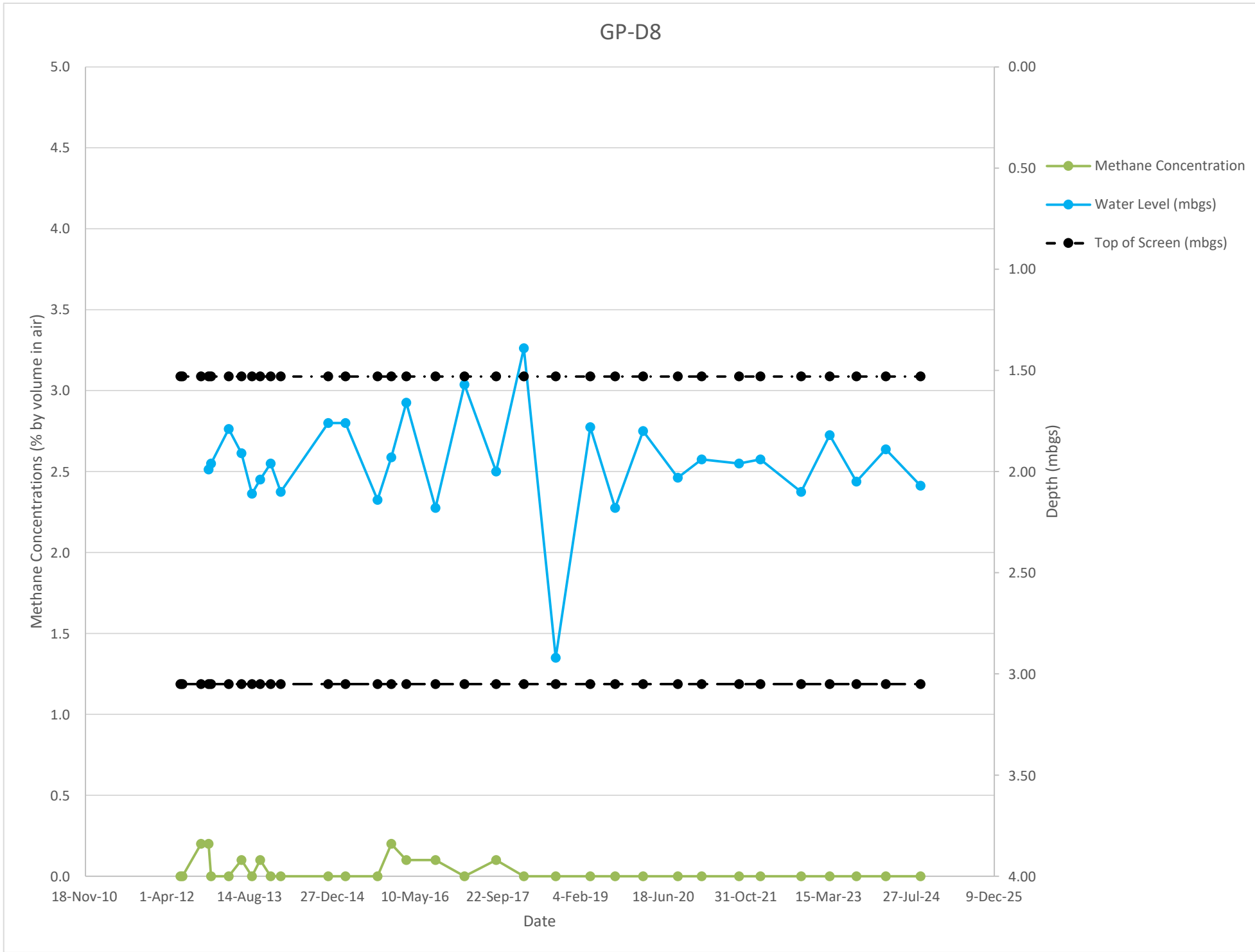
Landfill Gas Graphs

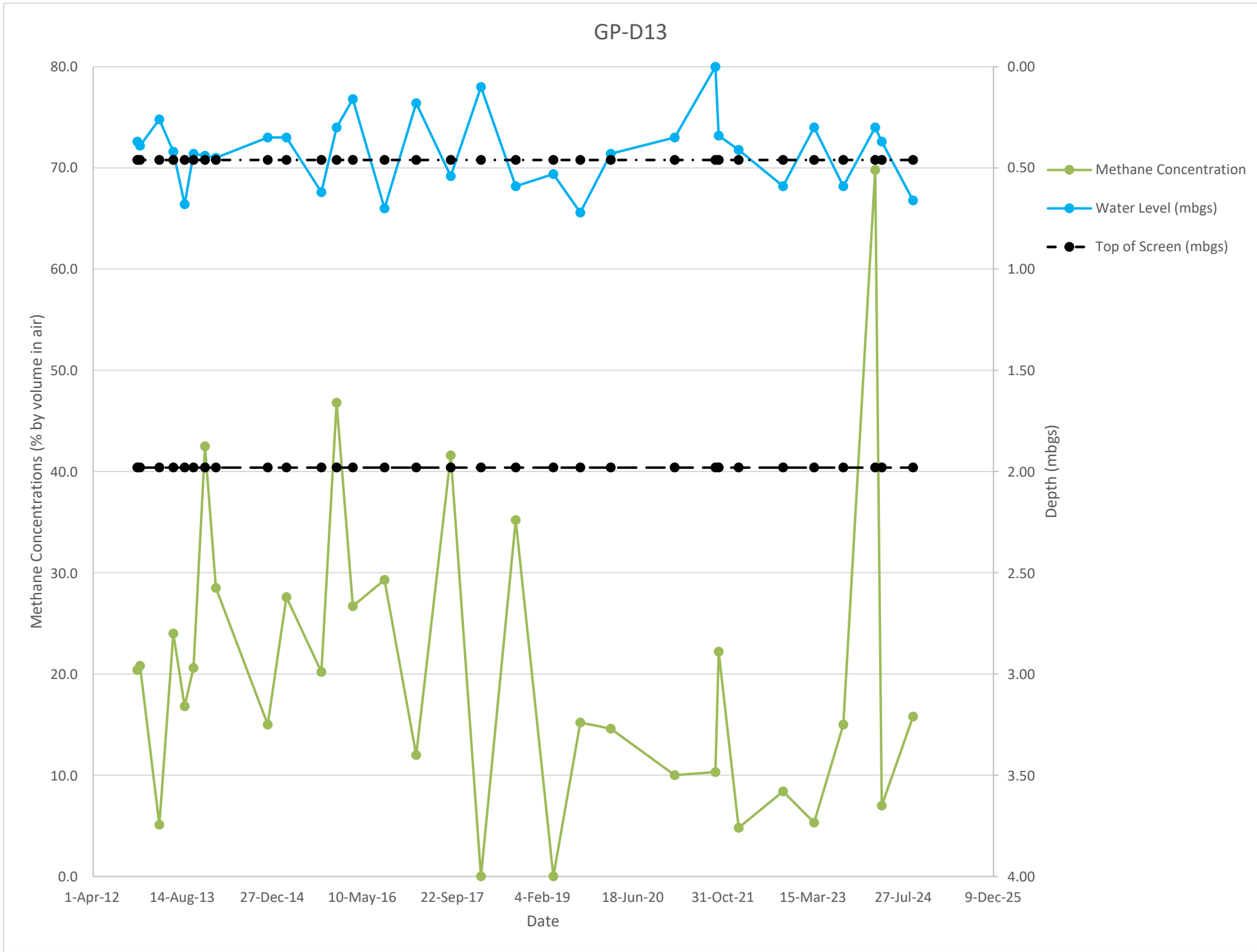

GP-D1
Methane Concentrations (% by volume in air)
Depth (mbgs)
Date
Methane Concentration
Water Level (mbgs)
Top of Screen (mbgs)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
18-Nov-10
1-Apr-12
14-Aug-13
27-Dec-14
10-May-16
22-Sep-17
4-Feb-19
18-Jun-20
31-Oct-21
15-Mar-23
27-Jul-24
9-Dec-25

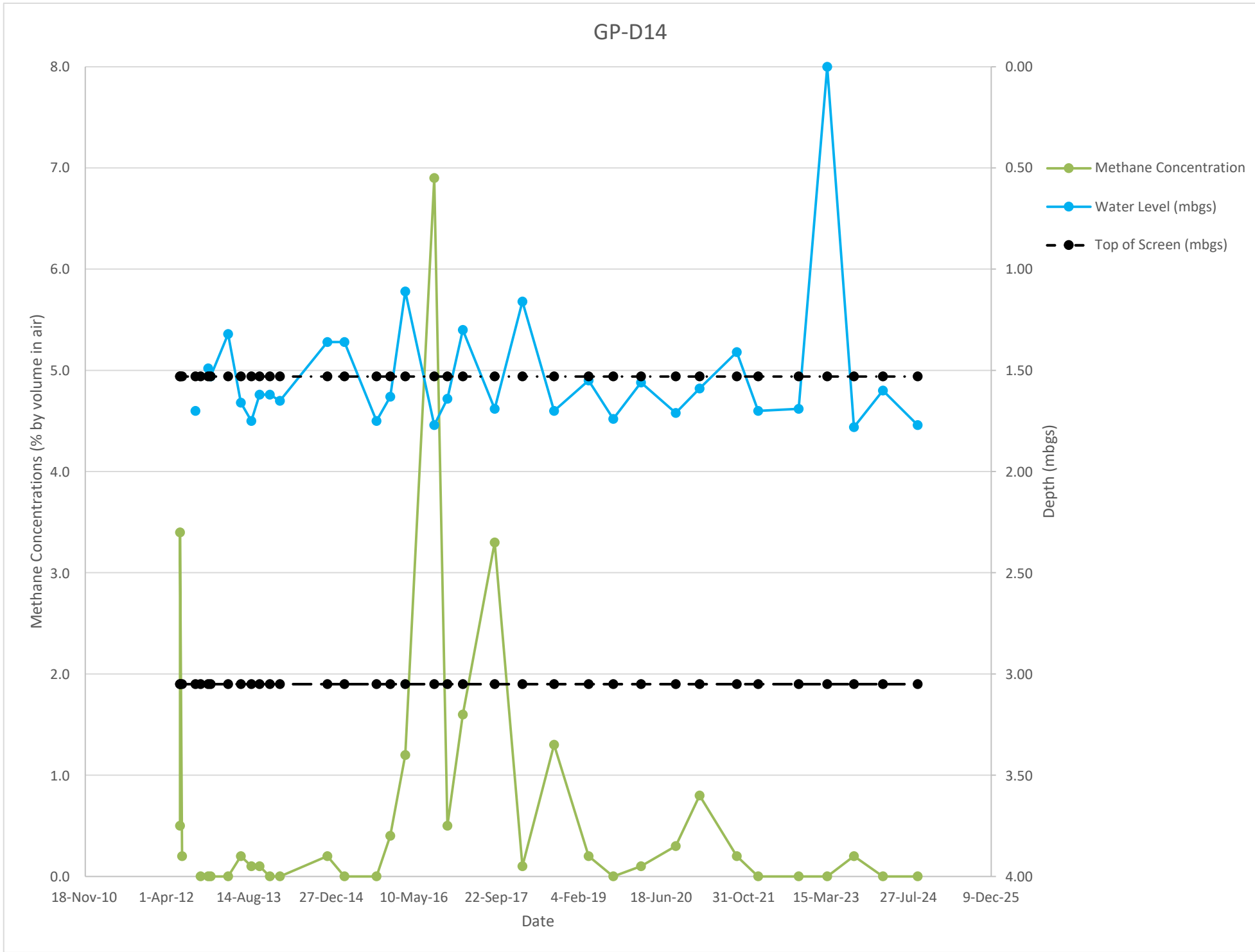

GP-D2
Methane Concentrations (% by volume in air)
Depth (mbgs)
Date
Methane Concentrations
Water Level (mbgs)
Top of Screen (mbgs)
25.0
20.0
15.0
10.0
5.0
0.0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
18-Nov-10
1-Apr-12
14-Aug-13
27-Dec-14
10-May-16
22-Sep-17
4-Feb-19
18-Jun-20
31-Oct-21
15-Mar-23
27-Jul-24
9-Dec-25

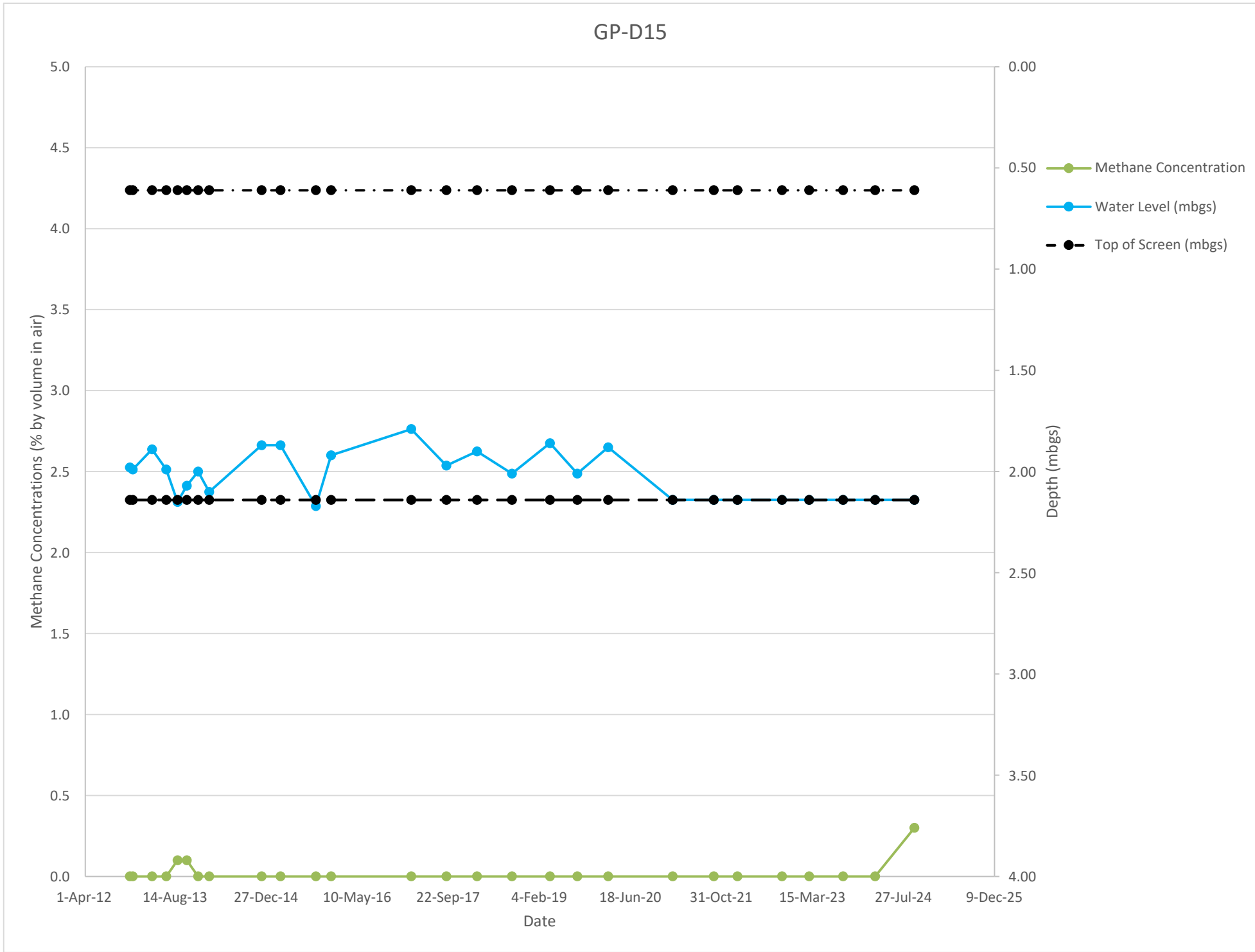

GP-D3
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Methane Concentrations (% by volume in air)
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
Depth (mbgs)
6-Jul-09
1-Apr-12
27-Dec-14
22-Sep-17
18-Jun-20
15-Mar-23
9-Dec-25
Date
Methane Concentration
Water Level (mbgs)
Top of Screen (mbgs)


GP-D7
Methane Concentrations (% by volume in air)
Depth (mbgs)
Date
Methane Concentration
Water Level (mbgs)
Top of Screen (mbgs)
Bottom of Screen (mbgs)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
18-Nov-10
1-Apr-12
14-Aug-13
27-Dec-14
10-May-16
22-Sep-17
4-Feb-19
18-Jun-20
31-Oct-21
15-Mar-23
27-Jul-24
9-Dec-25


GP-D8
Methane Concentrations (% by volume in air)
Depth (mbgs)
Date
Methane Concentration
Water Level (mbgs)
Top of Screen (mbgs)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
18-Nov-10
1-Apr-12
14-Aug-13
27-Dec-14
10-May-16
22-Sep-17
4-Feb-19
18-Jun-20
31-Oct-21
15-Mar-23
27-Jul-24
9-Dec-25


GP-D13
Methane Concentrations (% by volume in air)
Depth (mbgs)
Date
Methane Concentration
Water Level (mbgs)
Top of Screen (mbgs)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
1-Apr-12
14-Aug-13
27-Dec-14
10-May-16
22-Sep-17
4-Feb-19
18-Jun-20
31-Oct-21
15-Mar-23
27-Jul-24
9-Dec-25


GP-D14
Methane Concentrations (% by volume in air)
Depth (mbgs)
Date
Methane Concentration
Water Level (mbgs)
Top of Screen (mbgs)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
18-Nov-10
1-Apr-12
14-Aug-13
27-Dec-14
10-May-16
22-Sep-17
4-Feb-19
18-Jun-20
31-Oct-21
15-Mar-23
27-Jul-24
9-Dec-25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Depth (mbgs)
Date
Methane Concentration
Water Level (mbgs)
Top of Screen (mbgs)
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3.0
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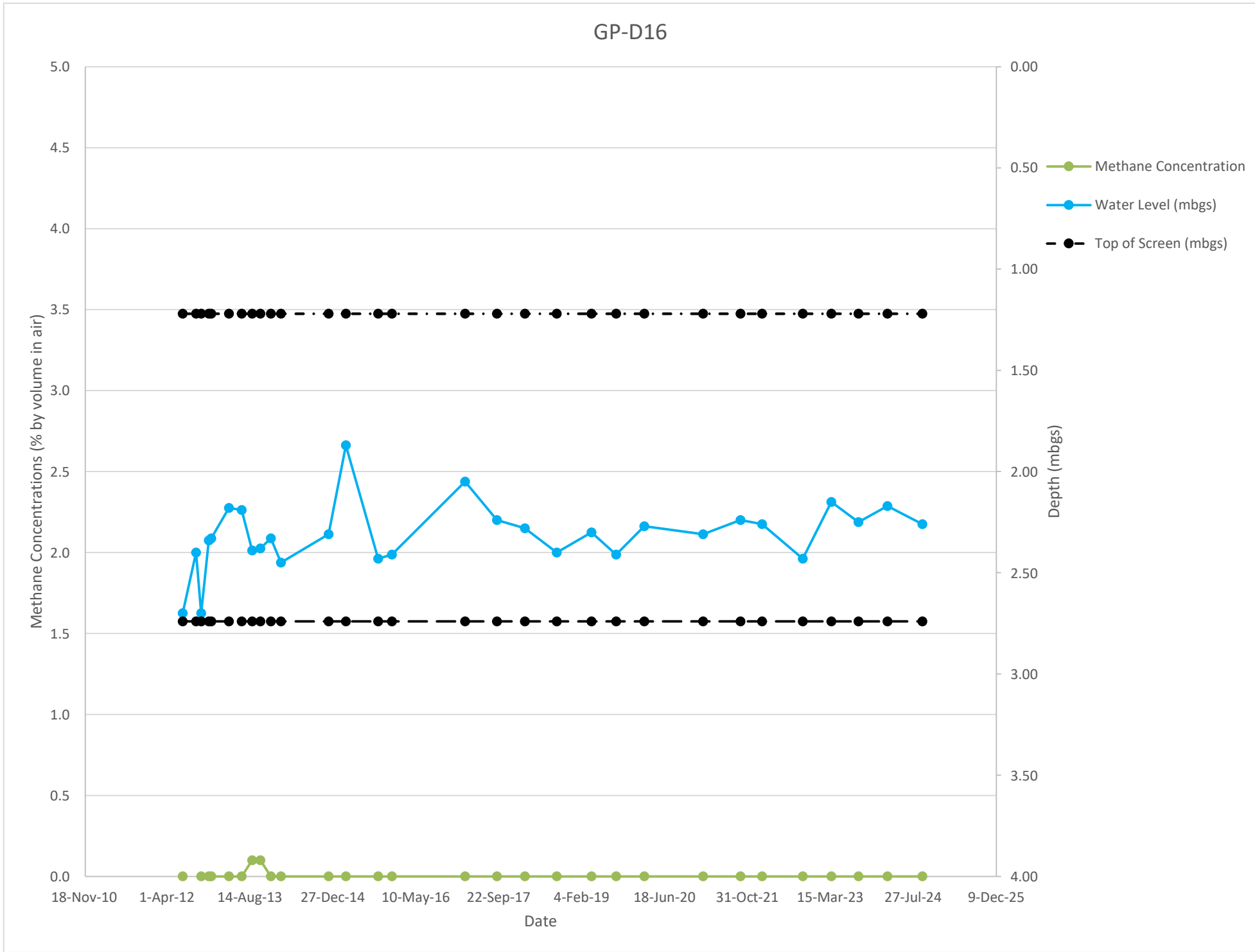
27-Jul-24
9-Dec-25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Depth (mbgs)
Date
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Water Level (mbgs)
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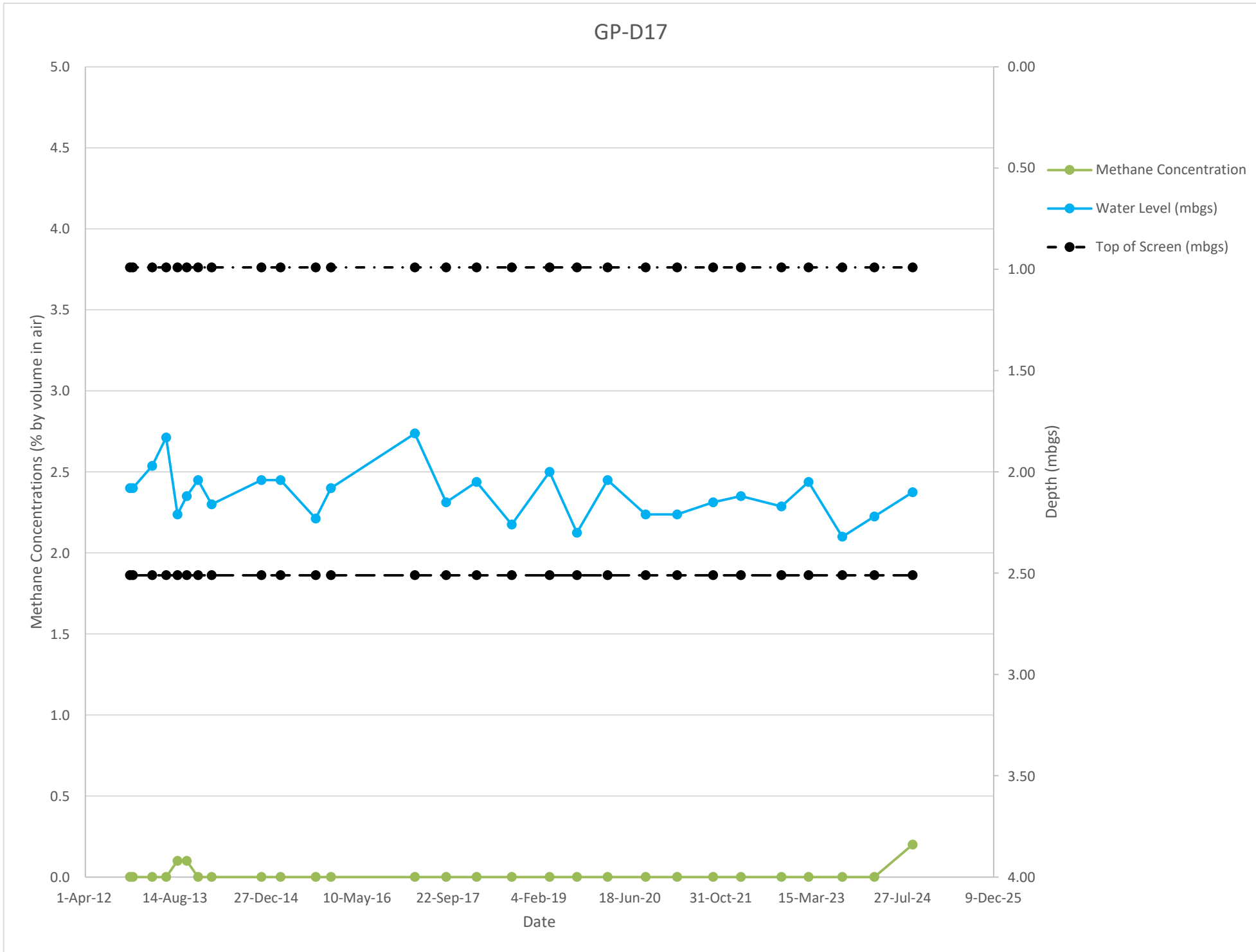
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Depth (mbgs)
Date
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Water Level (mbgs)
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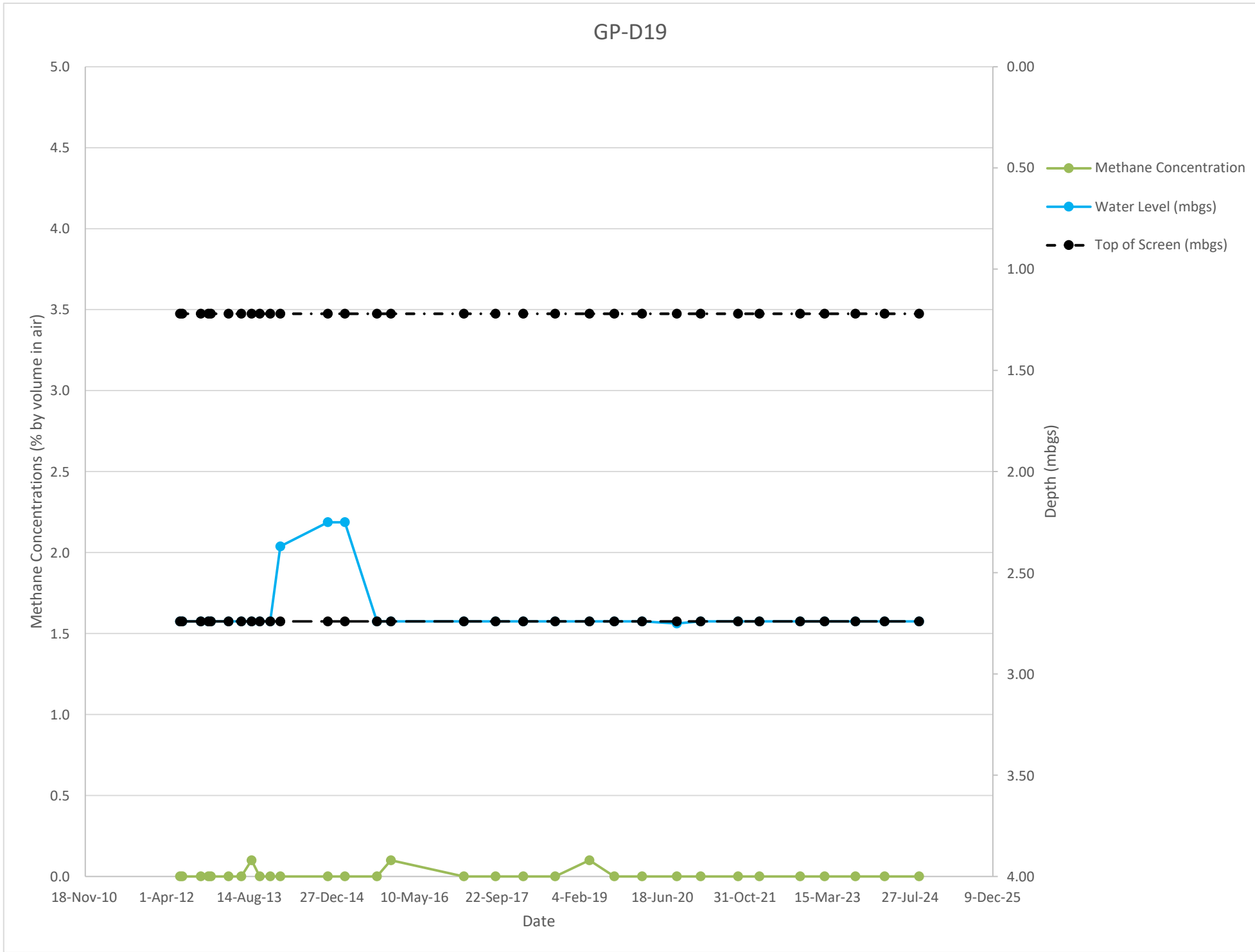
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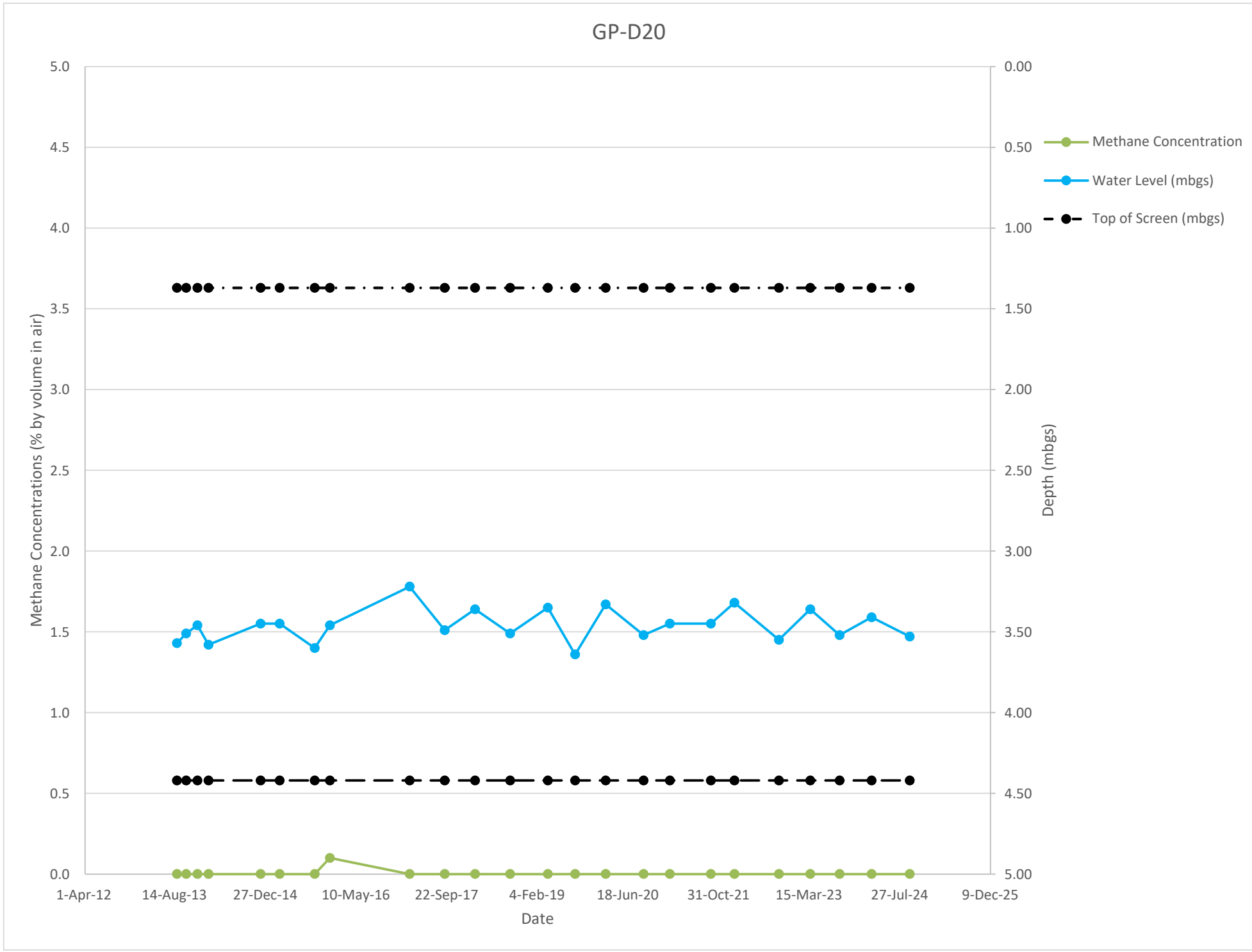
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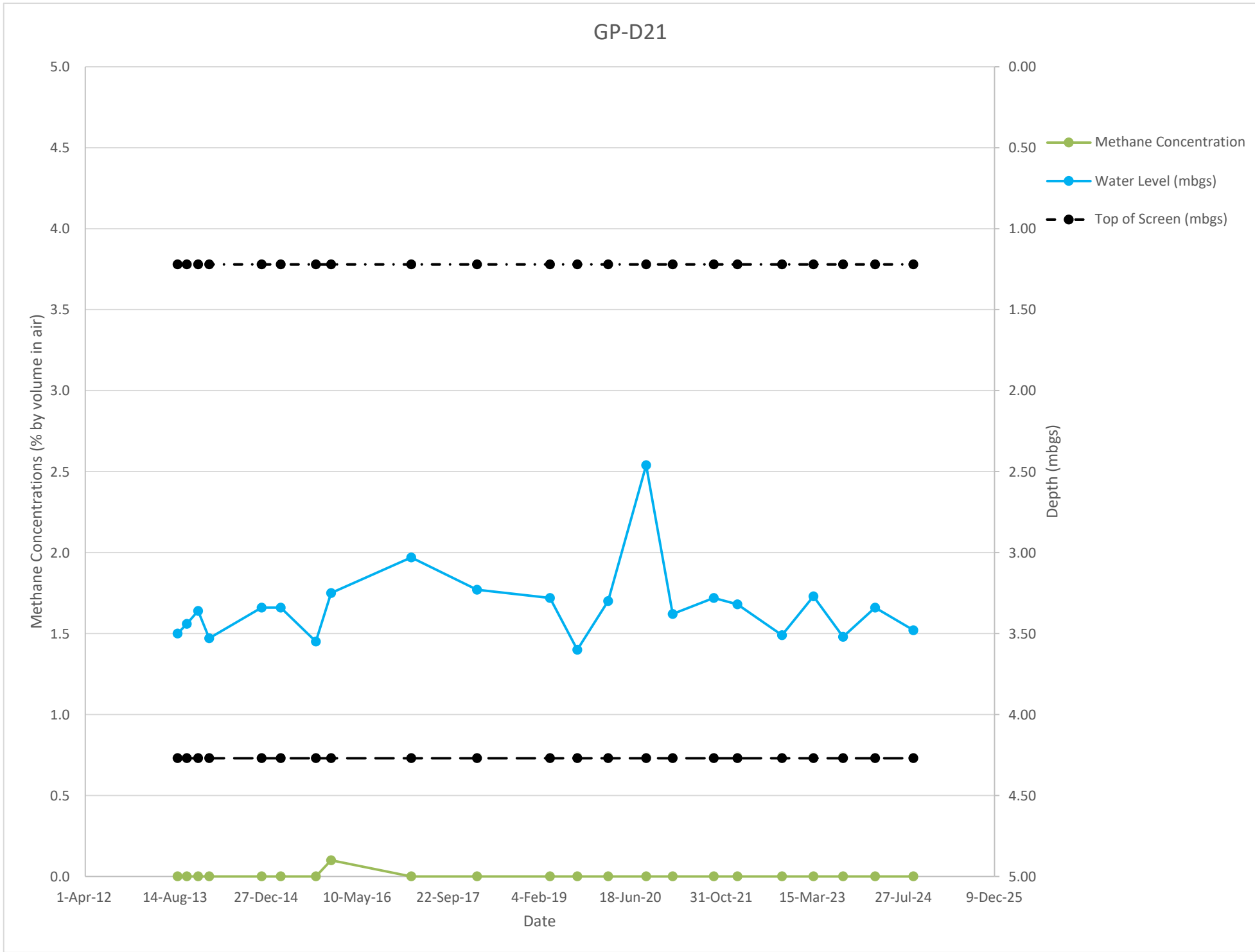
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Methane Concentration
Water Level (mbgs)
Top of Screen (mbgs)
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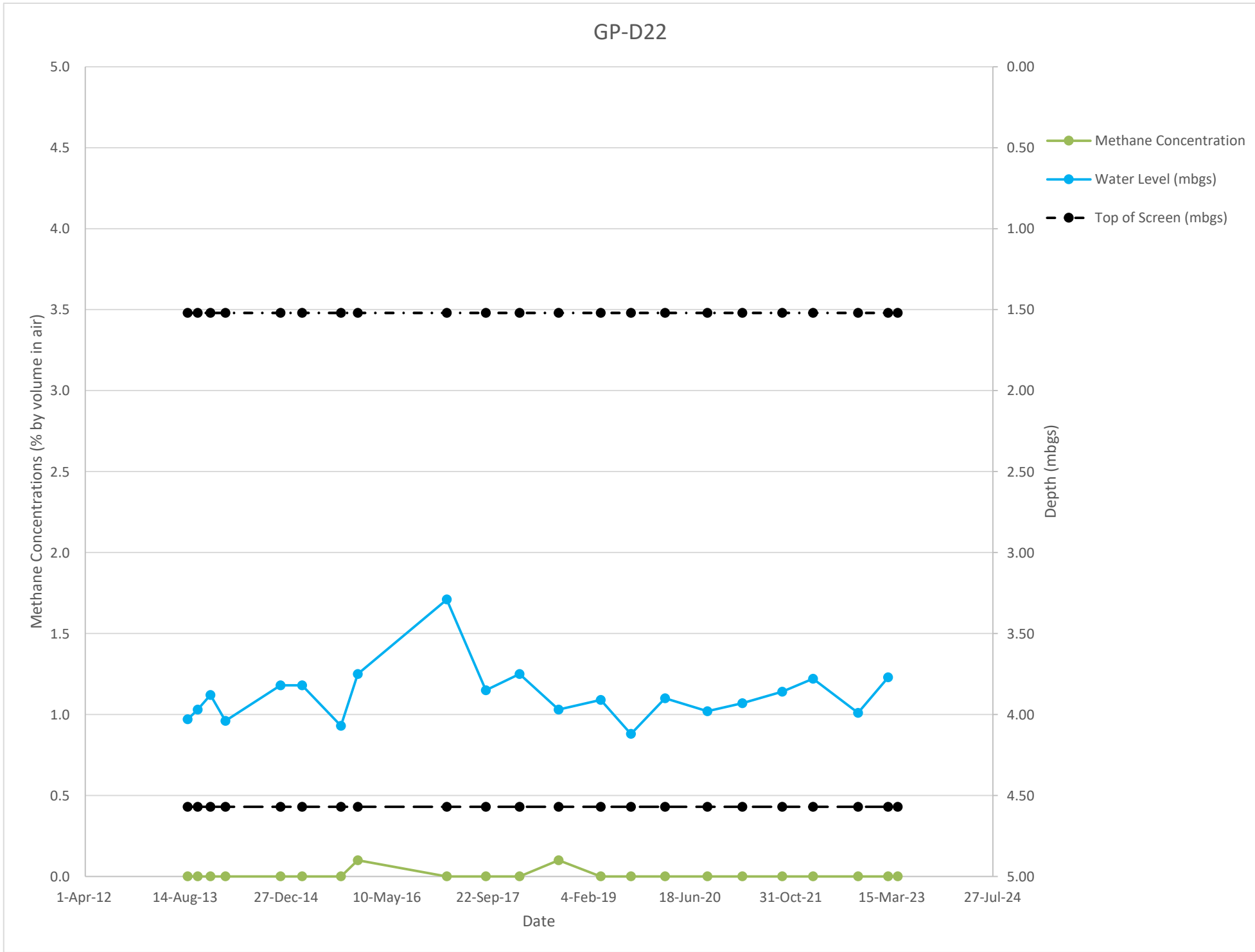
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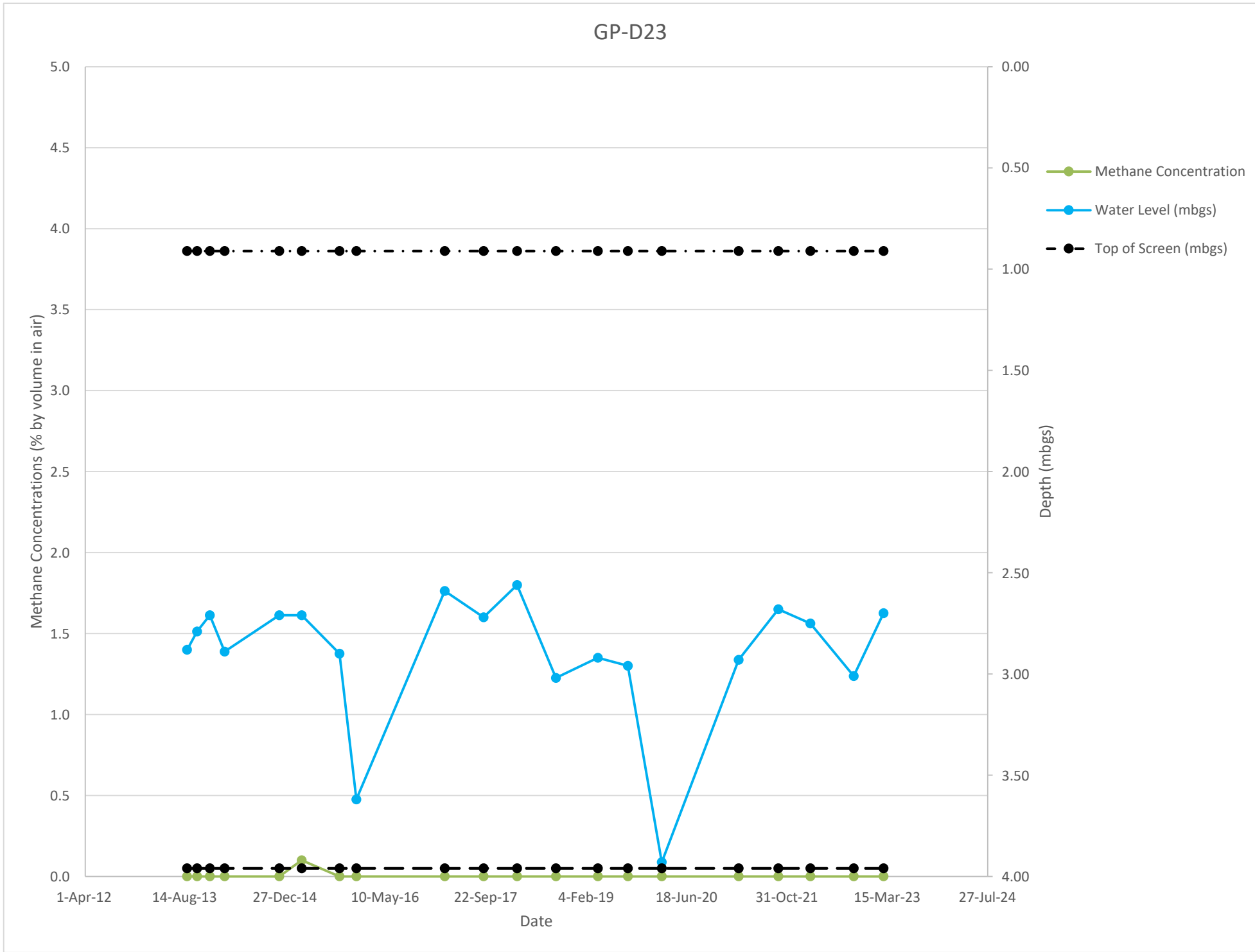
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Water Level (mbgs)
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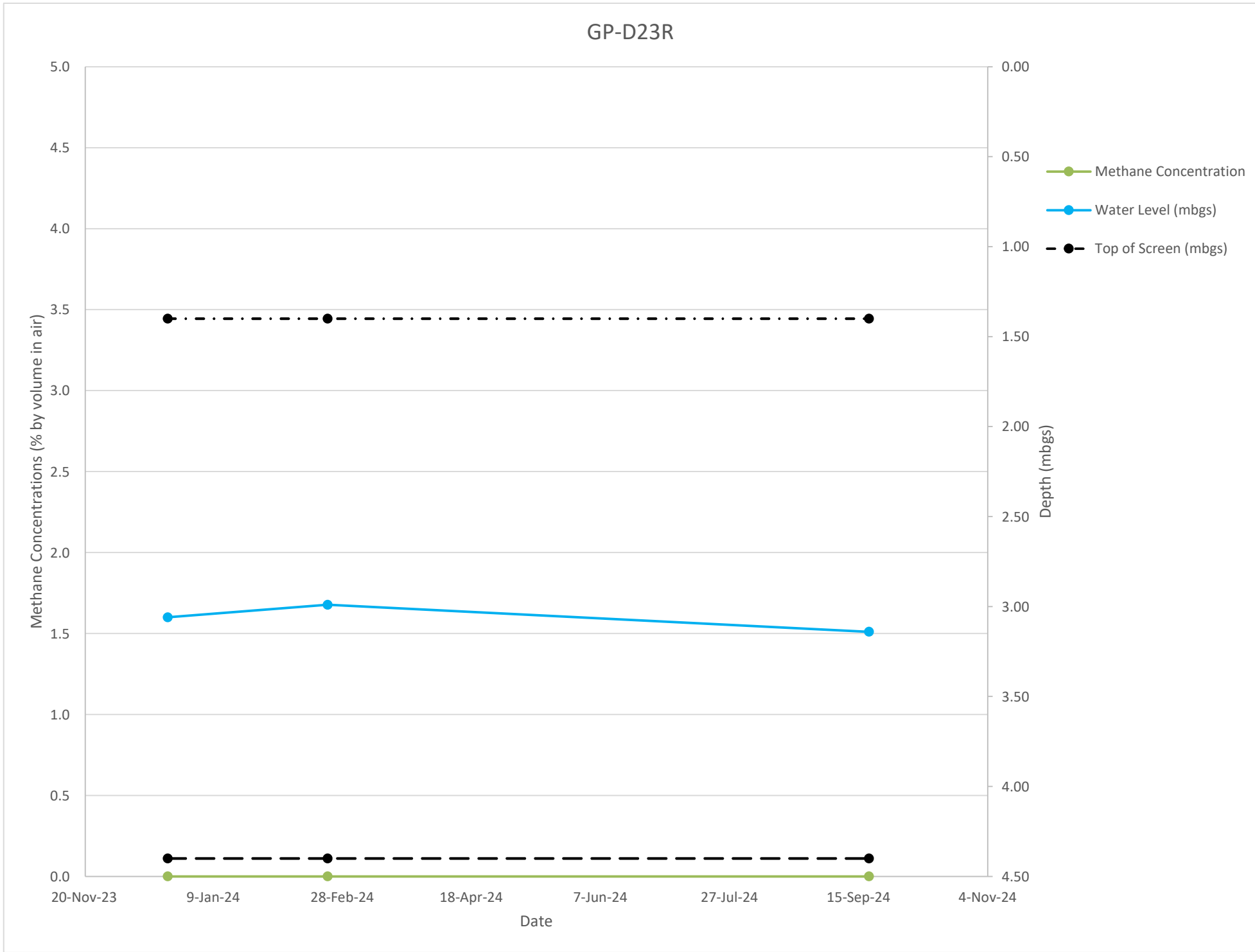
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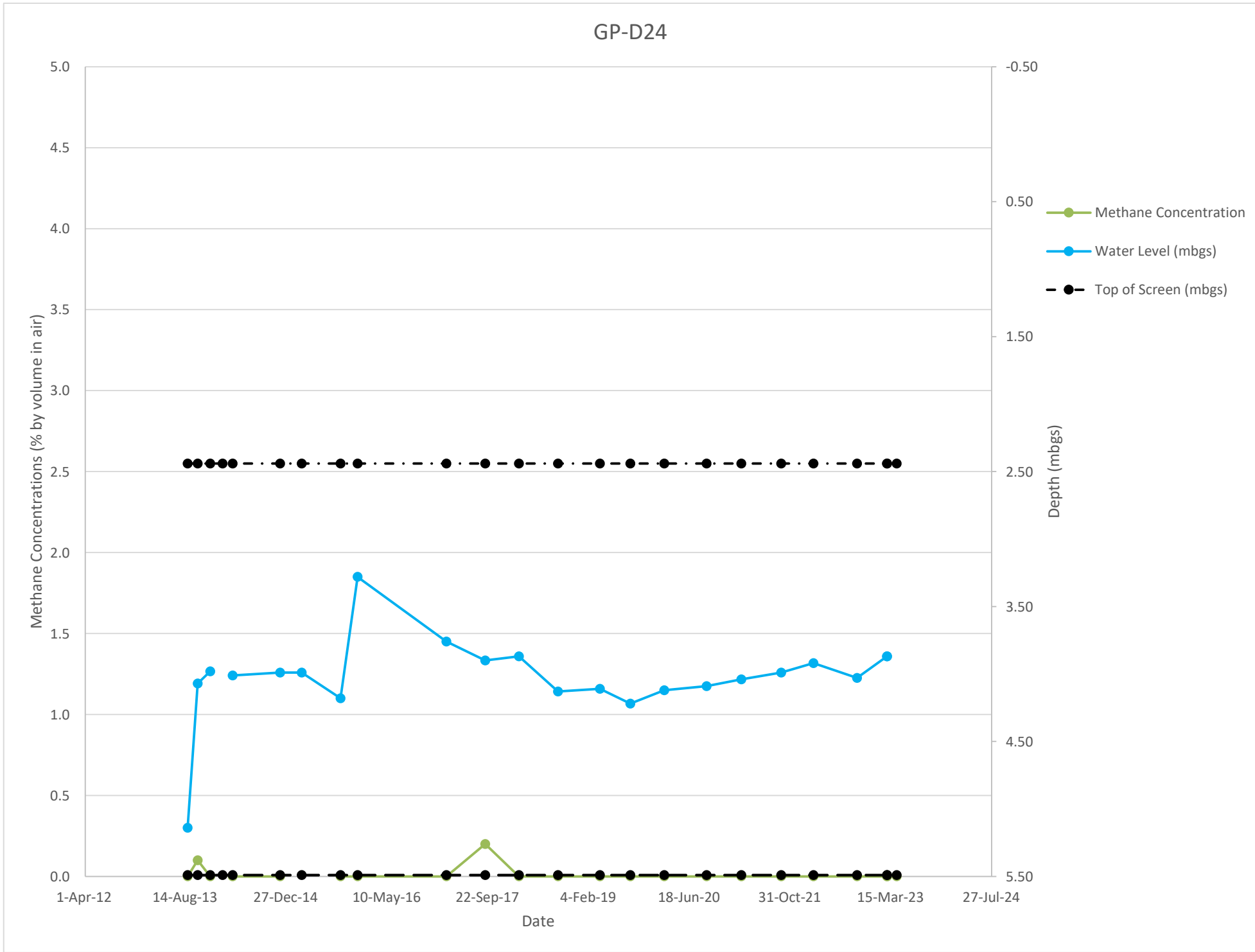
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10-May-16
22-Sep-17
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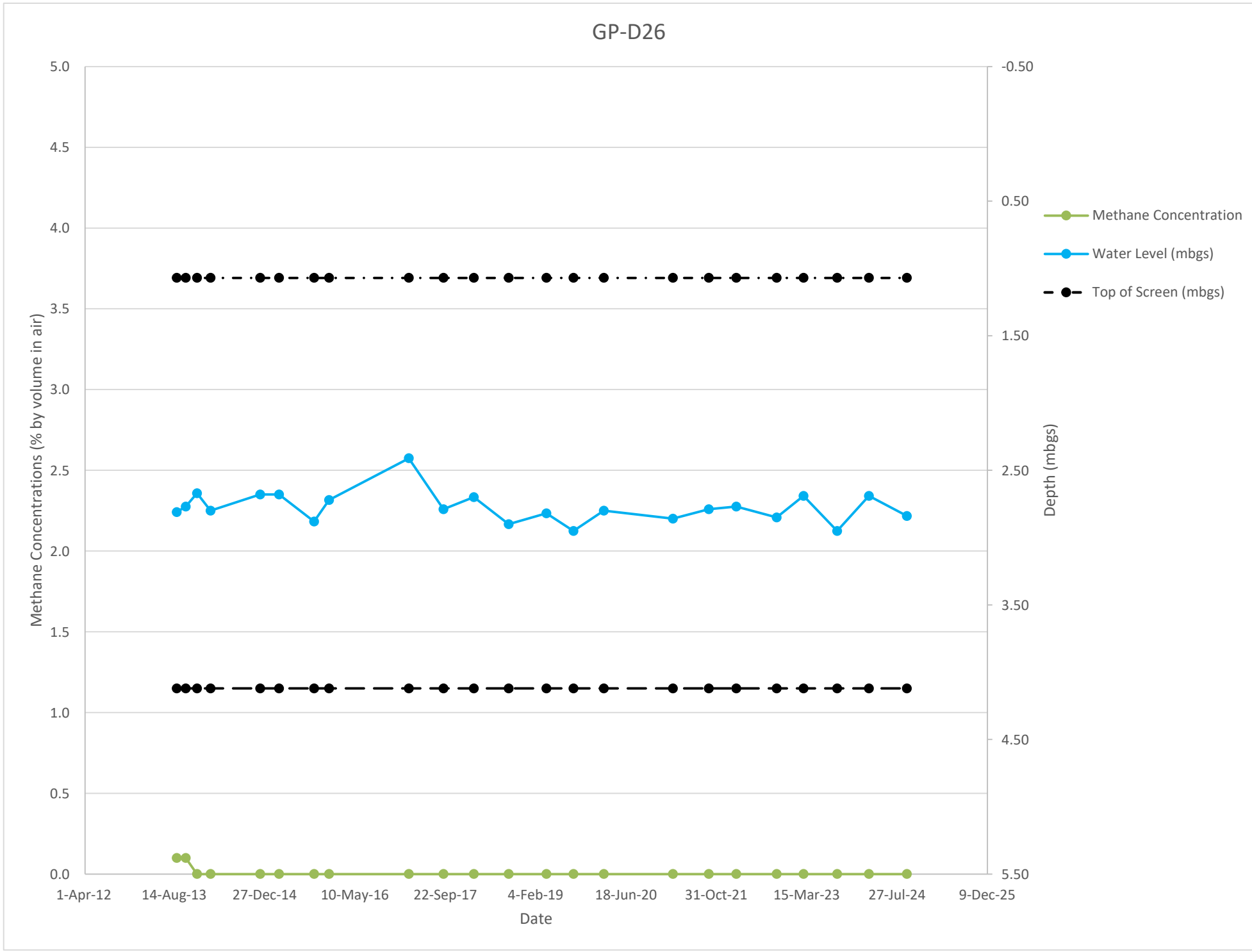
31-Oct-21
15-Mar-23
27-Jul-24
Methane Concentration
Water Level (mbgs)
Top of Screen (mbgs)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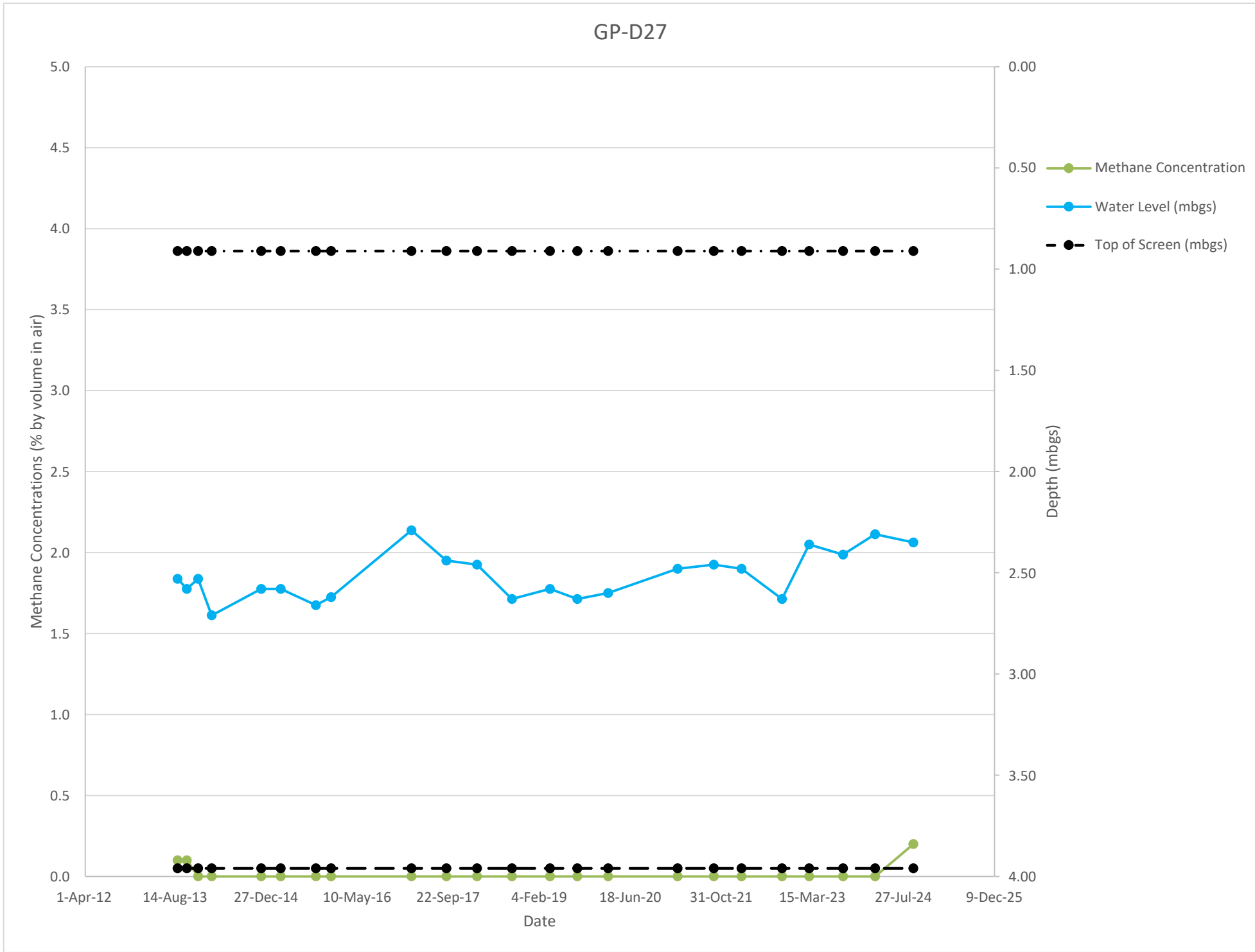
GP-D27
Methane Concentrations (% by volume in air)
Depth (mbgs)
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Methane Concentration
Water Level (mbgs)
Top of Screen (mbgs)
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22-Sep-17
4-Feb-19
18-Jun-20
31-Oct-21
15-Mar-23
27-Jul-24
9-Dec-25

APPENDIX E

ECA Air No. 3118-BD5KTE

Landfill Gas Barrier and Passive Venting System Proposed LFG Monitoring Plan

CITY OF BARRIE HISTORIC WASTE SITE 6

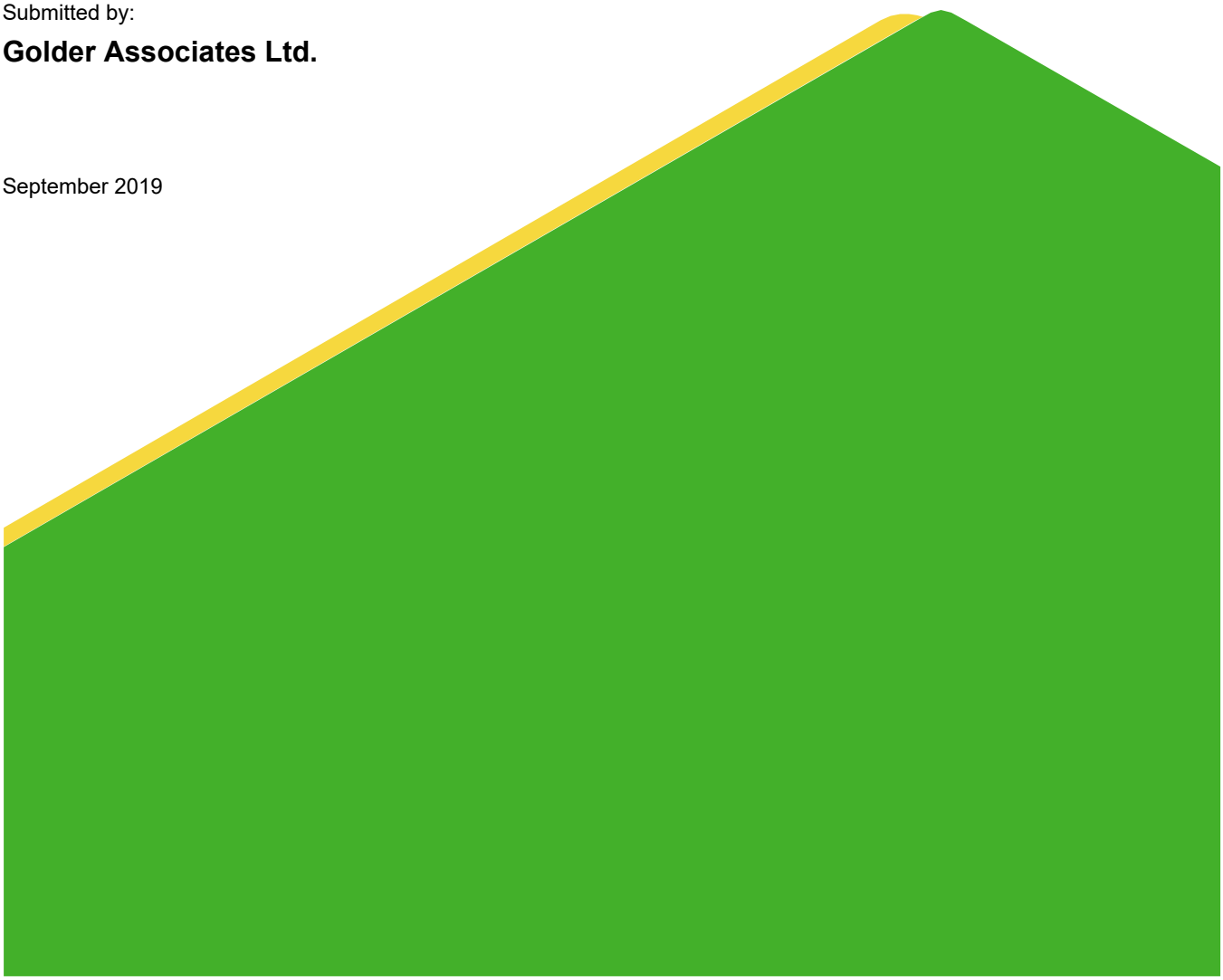
Submitted to:

The City of Barrie
70 Collier Street
Barrie, Ontario
L4M 4T5

Submitted by:

Golder Associates Ltd.

September 2019



Distribution List

e-copy – City of Barrie

e-copy – MECP Barrie District Manager

e-copy – Golder Associates Ltd.

Table of Contents

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by the City of Barrie (the City) to prepare a monitoring plan for the Landfill Gas (LFG) Barrier and Passive Venting System at the Historic Waste Site 6 (the Landfill) located on the north side of Dyment's Creek, at the west end of Frederick Street, between Innisfil Street and John Street (Figure 1). Implementation of the Barrier and Passive Venting System was recently approved by the Ministry of Environment, Parks and Climate Change (MECP) through issue of Environmental Compliance Approval for Air (ECA Air) No. 3118-BD5KTE, dated June 14, 2019 (Appendix A). Condition 2.1 of the ECA requires submission of a draft Monitoring Plan for the system not later than six months after the date of the approval.

2.0 BACKGROUND

Starting in 2011, Golder has completed environmental investigations at Historic Waste Site 6. The waste fill area is within the lowland area of Dyment's Creek and is suspected to extend onto residential properties on John Street, Frederick Street and Innisfil Street as shown in Figure 2 (Golder, 2018). These properties include 113 and 115 John Street, 15 and 20 Frederick Street and 134 and 136 Innisfil Street.

The Landfill was operated from approximately 1962 to 1963 and is currently an open space with public access from Frederick Street. There is no ECA for the landfill itself. The need for the landfill gas barrier/venting system relates to recent monitoring carried out by Golder for the Landfill, which identified an elevated risk of subsurface landfill gas migration onto adjacent off-Site private properties (Golder, 2017).

The waste fill thickness ranges from 0.05 m at several locations to a maximum of 4.37 m, and extends to a maximum depth of approximately 8 m below ground surface in the southwest portion of landfill. With the exception of a few areas of the landfill surface, there is a minimum of 1.0 m of soil fill above the top of the waste. For the most part, the waste identified in boreholes consists of non-degradable materials (e.g., glass, plastic, bricks and metal), however, putrescible materials, including animal hides were encountered in a few boreholes. It is noted that in the northwest part of the landfill, the waste material consists largely of inorganic debris.

In 2017, Golder undertook an investigation to assess the risk of LFG migration to adjacent private properties (Golder, 2017). The investigation included monitoring of landfill gas concentrations at a number of gas probes installed along the Landfill boundary. The monitoring indicated elevated (above 5% by volume) methane concentrations along the north and east boundaries. Golder recommended that remediation of landfill gas migration from the landfill be undertaken to limit the City's risk of impacting off-site properties; ultimately a barrier and passive venting system was selected as the most feasible alternative. The Landfill Gas Barrier and Passive Venting System was approved by the MECP through issue of Environmental Compliance Approval for Air (ECA Air) No. 5412-BE7KES, dated June 14, 2019 (Appendix A). Construction is scheduled for the Fall of 2019.

The Landfill Gas Barrier and Passive Venting System will operate 24 hours per day, 365 days per year. The system is passive and therefore there are no sources of noise (e.g. fans/blowers) associated with its operation. Emissions vent passively through turbine ventilators that are powered primarily by the wind.

3.0 LANDFILL GAS BARRIER AND PASSIVE VENTING SYSTEM DESIGN

The proposed landfill gas barrier consists of a 202 m length of interlocking steel sheet piles (Waterloo Barrier ™), installed on City land bordering the adjacent private properties on Frederick Street and John Street (Figure 2). The vertical barrier wall will protect against lateral migration of landfill gas via the unsaturated zone onto these private properties.

To collect and vent landfill gas that accumulates along the landfill side of the barrier wall, a shallow 1.2 m deep x 0.75 m wide trench backfilled with processed medium sand (OPSS 1002 – Concrete Sand) and 150 mm nominal diameter perforated tubing is proposed along the full length of the barrier wall. The perforated tubing will connect to a vent pole at three locations adjacent the trench (GVP1 to GVP3), as shown in Figure 2. The vent poles will consist of a 6.0 m high hollow/tapered galvanized steel pole fitted with a 100 mm diameter wind turbine at the top and will be founded on a concrete pier. Each vent pole will have a port covered with a removable steel plate to allow monitoring of landfill gas concentrations.

4.0 MONITORING PLAN

4.1 Field Measurements, Sampling and Laboratory Analysis

The proposed monitoring plan for the LFG barrier/venting system, including requirements for monitoring frequency, field measurements and laboratory analyses is provided in Table 1 below. A semi-annual monitoring frequency is proposed at eleven existing LFG monitoring wells (GP-D1, GP-D2, GP-D3, GP-D8, GPD-13, GPD-14, GP-D20, GP-D21, GP-D22, GP-D23 and GP-D24) and three gas venting poles (GVP1 to GVP3). One of the monitoring rounds should be completed under frozen ground conditions (February/March). These monitoring locations are shown on Figure 2. Monitoring of the landfill gas probes and vent poles is required in order to confirm that the landfill gas barrier/venting system is effective in intercepting and venting lateral migration of landfill gas.

Table 1: LFG Sampling and Monitoring Program

Location	Frequency	Parameters
Gas Probes: GP-D1, GP-D2, GP-D3, GP-D8, GPD-13, GPD-14, GP-D20, GP-D21, GP-D22, GP-D23 and GP-D24	Semi-Annually (one in frozen ground conditions)	**Field Measurement:** Concentration of methane (% volume and % Lower Explosive Limit (LEL)), carbon dioxide (% volume) and oxygen (% volume) and groundwater level
Vertical Passive Gas Vent System Poles: GVP1, GVP2, GVP3 (sampling port at lower portion of pole)	Semi-Annually (one under frozen ground conditions)	**Field Measurement:** Concentration of methane (% volume and % Lower Explosive Limit (LEL)), carbon dioxide (% volume) and oxygen (% volume) **Flow Rate:** Flow rate of landfill gas venting upward within the vent system pole as measured using VelociCalc ventilation meter
	Semi-Annually (one under frozen ground conditions)	**Laboratory Analysis:** Concentration of methane, hydrogen sulphide, oxygen, carbon monoxide, carbon dioxide and volatile organic compounds (collected via Tedlar Bag)

Measurement of the depth to the groundwater level below the top of pipe will be obtained at each gas probe prior to gas sampling and used to calculate the volume of air to be purged prior to sampling. The minimum purging volumes will be three times the volume of air initially present in the monitoring probe. The gas readings will include the concentrations of carbon dioxide (CO_2), methane (CH_4), and oxygen (O_2) recorded using a calibrated Landtec Gas Analyzer and Extraction Monitor (GEM 2000 or GEM 5000).

The methane gas concentration (%LEL and %volume) and gas flow rate will be measured in the field at each gas venting pole. The flow rate will be measured using a VelociCalc ventilation meter. In addition, a sample at each venting pole will be collected in a Tedlar bag and sent to the laboratory for analysis of methane, hydrogen sulphide, oxygen, carbon monoxide, carbon dioxide and volatile organic compounds. Emission rates will be calculated using the maximum measured concentration (ppb or $\mu g/m^3$) of each contaminant in any of the vents during each sampling round and the average volumetric flow rate (m^3/s) to determine an emission rate (g/s).

4.2 Additional Observations - Wind Speed / Direction and Odours

The meteorological data at the time of monitoring, including the wind speed and direction and barometric pressure should be recorded. Meteorological data will be collected from the nearby City of Barrie Landfill Weather Station. This station is located approximately 3 km northwest of the Site, and therefore this weather station is considered to be adequate to represent Site weather conditions during the monitoring events. Should the Barrie Landfill Weather Station be unavailable at the time of monitoring, weather data from the nearby Environment Canada Barrie-Oro Weather Station will be used.

Any landfill gas odours observed at the time of monitoring will also be recorded. If odours are noted, the technician will identify and record the source of the odour.

4.3 Reporting

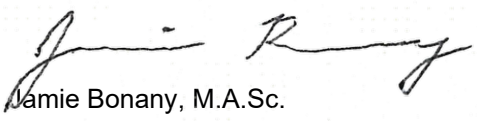
Section 2.2 of the ECA Air requires an annual report to be submitted by March 31 of each year. The annual report for the barrier and passive venting system will be submitted as part of the Annual Monitoring Report for the Dyment's Creek Historic Waste Sites and will include, as a minimum:

- the frequency of monitoring adopted;
- the measured volumetric flow rates of the landfill gas discharging up the vertical vent poles and the concentrations of contaminants in the gas discharging to the atmosphere via the vent poles;
- the wind speeds and wind directions recorded at the time of monitoring; and,
- the results of dispersion calculations, using one of the approved dispersion models listed in Section 6 of O. Reg 419/05, indicating the maximum point of impingement concentrations of contaminants in the gas discharging to air.

We trust that this proposed Monitoring Plan meets your immediate needs. Should you require any additional information or clarification, please do not hesitate to contact the undersigned.

Yours truly,

GOLDER ASSOCIATES LTD.

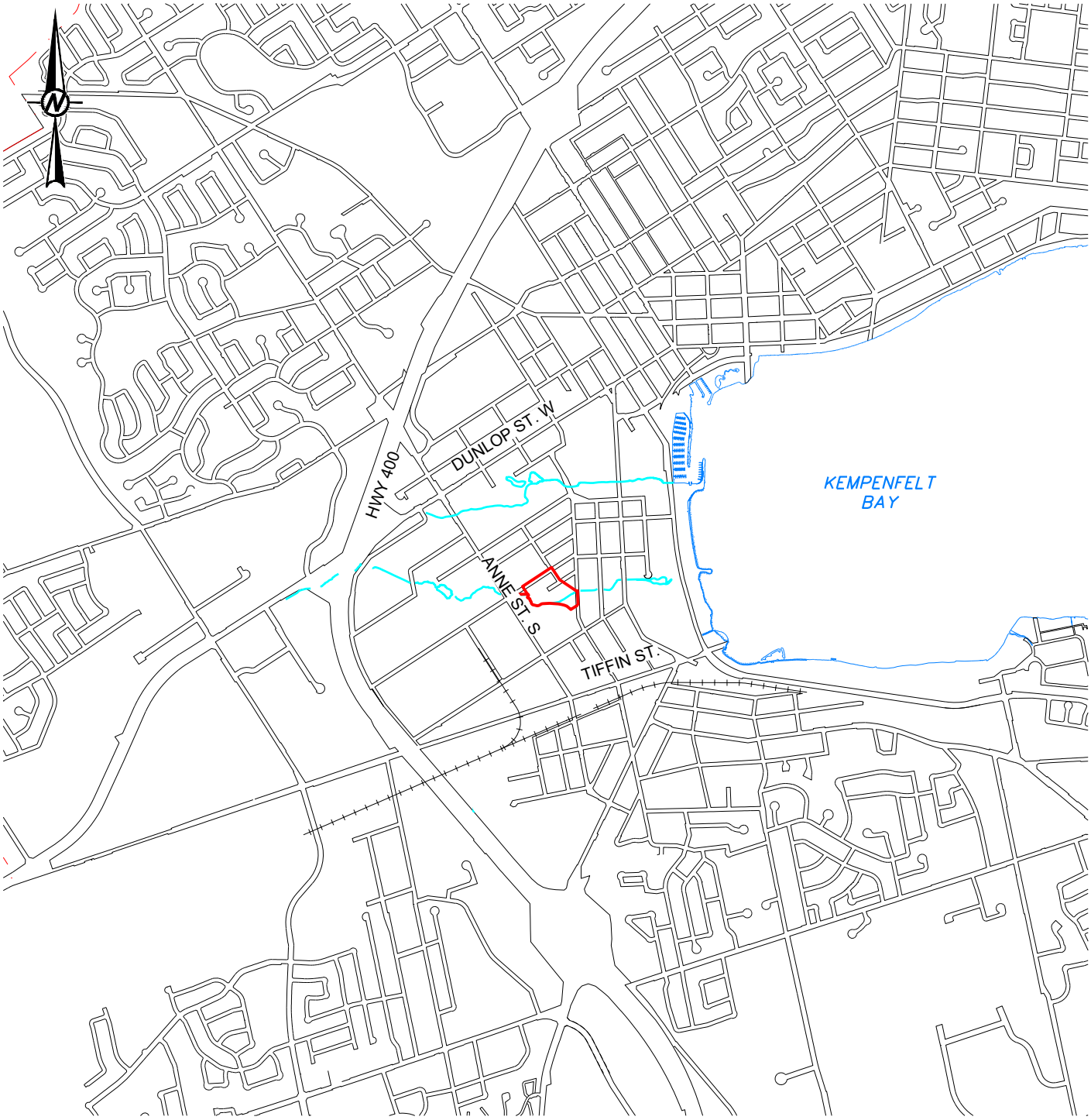


Jamie Bonany, M.A.Sc.
Project Scientist

Frank Barone, Ph.D., P.Eng.
Principal, Senior Geo-Environmental Engineer

JEB/FB/cmd

FIGURES



LEGEND

SITE LOCATION

NOTE(S)

1. DATUM IS NAD UTM 83 ZONE 17
2. MAPPING BASED ON COUNTY OF SIMCOE MUNICIPAL BASE

0 500 1,000

1:30,000 METRES

CLIENT
CITY OF BARRIE

PROJECT
SITE 06 HISTORIC LANDFILL
PASSIVE LANDFILL GAS BARRIER / VENTING SYSTEM

CONSULTANT
GOLDER

YYYY-MM-DD	2019-09-18
DESIGNED	
PREPARED	STB
REVIEWED	JEB
APPROVED	

TITLE
KEY PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
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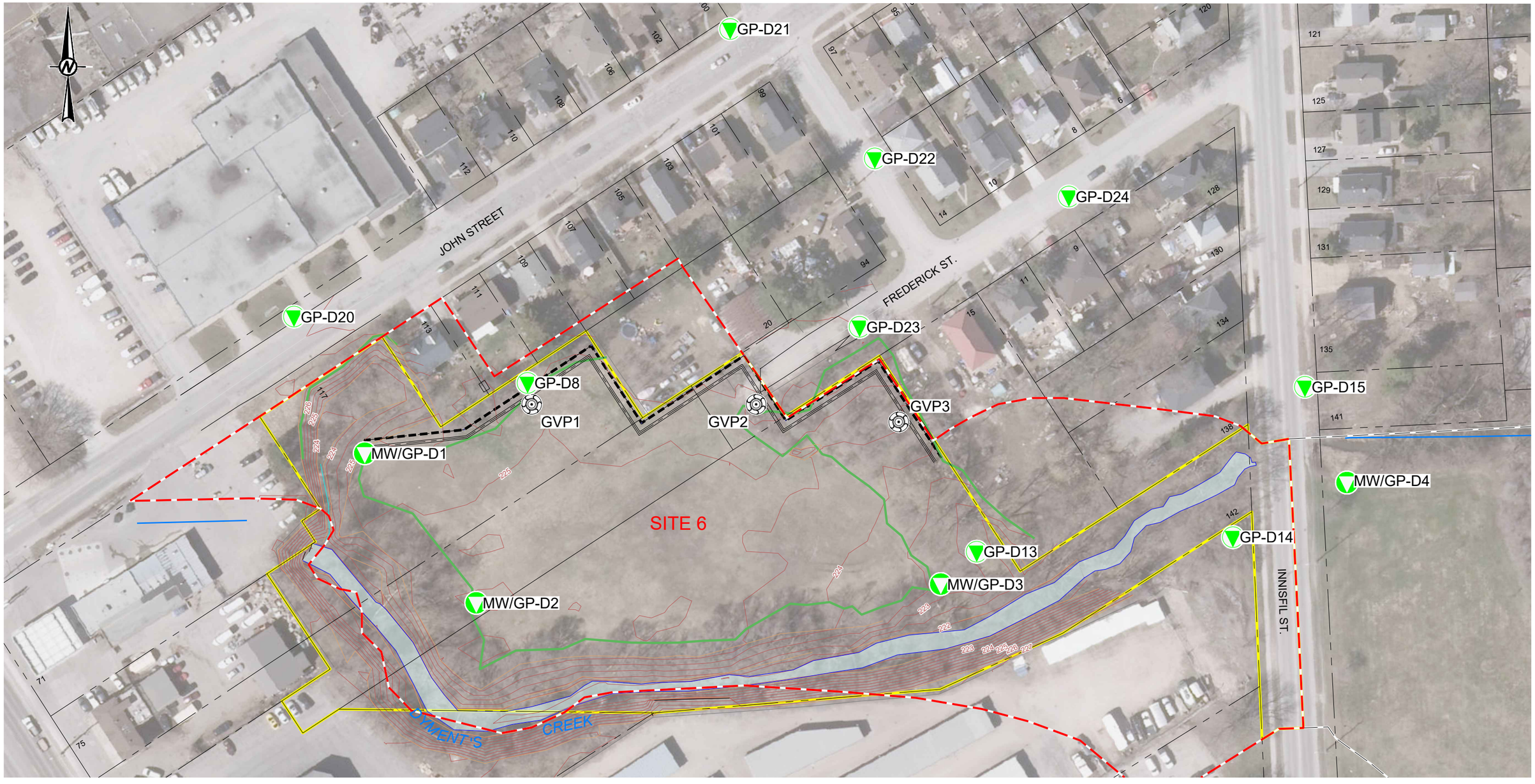

LEGEND

- ESTIMATED WASTE LIMIT
- CITY OF BARRIE OWNED LANDS
- PROPERTY LINE (CITY OF BARRIE PARCEL FABRIC)
- SURVEYED TREE LINE
- PROPOSED ALIGNMENT OF SHEET PILE WALL
- LAYOUT CONTROL POINT ALONG SHEET PILE BARRIER WALL
- PROPOSED GAS VENT TRENCH
- EXISTING GAS PROBE / MONITORING WELL
- PROPOSED GAS VENTING POLE
- EXISTING GROUND SURFACE CONTOURS (SEE REFERENCE 2)

0 25 50
1:1,000 METRES

NOTE(S)

1. DATUM IS NAD83 ZONE 17
2. ALL MAPPED BOUNDARIES, LIMITS, AND INTERPOLATED FEATURES ARE APPROXIMATE
3. FIGURE ISSUED FOR ECA AIR APPLICATION

REFERENCE(S)

1. BASE MAP COURTESY CITY OF BARRIE DIGITAL 1:2000 MUNICIPAL MAPPING
2. TOPOGRAPHIC SURVEY OF LANDFILL BY SMC GEOMATICS, DECEMBER 2018
3. HISTORICAL LANDFILLS ANNUAL MONITORING REPORT, GOLDER, 2018. 2017 ANNUAL MONITORING PROGRAM - DYMENT'S CREEK HISTORICAL LANDFILLS, JANUARY, 2018
4. ORTHOIMAGE FROM DISCOVER SIMCOE, 2016 IMAGERY ACCESSED JANUARY 2019

CLIENT
CITY OF BARRIE

CONSULTANT
GOLDER

YYYY-MM-DD	2019-01-04
DESIGNED	
PREPARED	STB
REVIEWED	JEB
APPROVED	

PROJECT
SITE 06 HISTORIC LANDFILL
PASSIVE LANDFILL GAS BARRIER / VENTING SYSTEM

TITLE
SYSTEM LAYOUT / MONITORING LOCATIONS

PROJECT NO.	CONTROL	REV.	FIGURE
18109243	0006	A	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25 mm

APPENDIX A

ECA Air

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 3118-BD5KTE
Issue Date: June 14, 2019

The Corporation of the City of Barrie
70 Collier Street
Post Office Box, No. 400
Barrie, Ontario
L4M 4T5

Site Location: Part of Lots 33, 34, 63 to 67, Part of Lots 32, 68 and 69,
Part of Lots 25, 81 to 88, and Part of Lots 77 to 80,
Reference Plan 493
City of Barrie, County of Simcoe

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

- one (1) passive landfill gas venting system, discharging to the air through three (3) passive vents each equipped with wind turbines, and each having an exit diameter of 0.10 metre and extending approximately 6.0 metres above grade;

all in accordance with the Environmental Compliance Approval Application submitted by The Corporation of the City of Barrie, dated February 11, 2019 and signed by Sandra Brunet, Manager; and the supporting information including the Emission Summary and Dispersion Modelling Report, submitted by Golder Associates Ltd., dated February 13, 2019 and signed by Katherine Armstrong; and e-mails dated June 3 and June 6, 2019 from Katherine Armstrong of Golder Associates Ltd.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "*Annual Report*" means a report containing the results of the *Monitoring Plan* implementation for the preceding year;

2. "*Approval*" means this Environmental Compliance Approval, including the application and supporting documentation listed above;

3. "*Company*" means The Corporation of the City of Barrie, that is responsible for the construction or operation of the *Facility* and includes any successors and assigns;

4. "*Director*" means a person appointed for the purpose of section 20.3 of the *EPA* by the *Minister* pursuant to section 5 of the *EPA;*

5. "*District Manager*" means the District Manager of the appropriate local district office of the *Ministry* where the *Facility* is geographically located;

6. "*EPA*" means the Environmental Protection Act, R.S.O. 1990, c.E.19, as amended;

7. "*Equipment*" means the equipment and processes described in the *Company* 's application, this *Approval* and in the supporting documentation submitted with the application, to the extent approved by this *Approval;*

8. "*Facility*" means the entire operation located on the property where the *Equipment* is located;

9. "*Manual*" means a document or a set of documents that provide written instructions to staff of the *Company;*

10. "*Monitoring Plan*" means a written plan developed to monitor the landfill gas collected and discharged from the *Equipment* at the site;

11. "*Ministry*" means the ministry of the government of Ontario responsible for the *EPA* and includes all officials, employees or other persons acting on its behalf;

12. "*Publication NPC-300*" means the *Ministry* Publication NPC-300, "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300", August 2013, as amended.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. OPERATION AND MAINTENANCE

1. The *Company* shall ensure that the *Equipment* is properly operated and maintained at all times. The *Company* shall:

   a. prepare, not later than three (3) months after the date of this *Approval,* and update, as necessary, a *Manual* outlining the operating procedures and a maintenance program for the *Equipment,* including:

i. routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the *Equipment* suppliers;

ii. emergency procedures;

iii. procedures for any record keeping activities relating to operation and maintenance of the *Equipment;* and

iv. all appropriate measures to minimize noise and odorous emissions from all potential sources;

b. implement the recommendations of the *Manual.*

2. MONITORING AND REPORTING

1. The *Company* shall submit to the *District Manager,* not later than one (1) month prior to the commencement of operations at the site, a draft *Monitoring Plan* for the gas collected and discharged from the *Equipment.* The *Company* shall finalize the *Monitoring Plan* in consultation with the *District Manager.* The finalized *Monitoring Plan* shall be implemented upon commencement of operations at the site and include, as a minimum, the following:

    a. the frequency of monitoring agreed upon by the *District Manager;*

    b. a methodology to measure the concentrations of contaminants in the gas discharging to the air; and

    c. procedures to measure and record the wind speed and wind direction at the location where the *Equipment* is installed, at times of monitoring.

2. The *Company* shall submit, not later than **March 31, 2021** and each subsequent year thereafter, to the *District Manager* an *Annual Report* on the results of the *Monitoring Plan* implementation for the preceding year. Each *Annual Report* shall include, as a minimum, the following:

    a. the frequency of monitoring adopted;

    b. the concentrations of contaminants in the gas discharging to the air;

    c. the wind speeds and wind directions recorded at the times of monitoring; and

    d. the results of dispersion calculations, using one of the approved dispersion models listed in section 6 of O. Reg. 419/05 applicable to the *Facility,* indicating the maximum point of impingement concentrations of contaminants in the gas discharging to the air using the results of monitoring.

3. The *Company,* upon submission of the third *Annual Report,* with approval from the *District Manager,* may amend the monitoring and reporting requirements of this *Approval.*

3. RECORD RETENTION

1. The *Company* shall retain, for a minimum of two (2) years from the date of their creation, all records and information related to or resulting from the recording activities required by this *Approval,* and make these records available for review by staff of the *Ministry* upon request. The *Company* shall retain:

    a. all records on the maintenance, repair and inspection of the *Equipment;* and

    b. all records of any environmental complaints, including:

        i. a description, time and date of each incident to which the complaint relates;

        ii. wind direction at the time of the incident to which the complaint relates; and

        iii. a description of the measures taken to address the cause of the incident to which the complaint relates and to prevent a similar occurrence in the future.

4. NOTIFICATION OF COMPLAINTS

1. The *Company* shall notify the *District Manager,* in writing, of each environmental complaint within two (2) business days of the complaint. The notification shall include:

    a. a description of the nature of the complaint; and

    b. the time and date of the incident to which the complaint relates.

5. NOISE

1. The *Company* shall, at all times, ensure that the noise emissions from the *Facility* comply with the limits set out in *Ministry Publication NPC-300.*

The reasons for the imposition of these terms and conditions are as follows:

1. Condition No. 1 is included to emphasize that the *Equipment* must be maintained and operated according to a procedure that will result in compliance with the *EPA,* the Regulations and this *Approval.*

2. Condition No. 2 is included to require the *Company* to gather accurate information so that compliance with the *EPA,* the regulations and this *Approval* can be verified.

3. Condition No. 3 is included to require the *Company* to keep records and to provide information to staff of the *Ministry* so that compliance with the *EPA,* the Regulations and this *Approval* can be verified.

4. Condition No. 4 is included to require the *Company* to notify staff of the *Ministry* so as to assist the *Ministry* with the review of the site's compliance.

5. Condition No. 5 is included to provide the minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the *Facility*.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment,
Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 14th day of June, 2019

THIS APPROVAL WAS MAILED
ON JUN 19 2019
(Signed)

Jeffrey McKerrall, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

BR/
c: District Manager, MECP Barrie

Katherine Armstrong, Golder Associates Ltd.

golder.com

Ministry of the Environment, Conservation and Parks
Drinking Water and Environmental Compliance Division

Central Region

Barrie District Office
1201-54 Cedar Pointe Drive
Barrie ON L4N 5R7
Tel: (705) 739-6441
Toll Free: 1-800-890-8511
Fax: (705) 739-6440

Ministère de l'Environment de la Protection de la nature et des Parcs
Division de la conformité en matière d'eau potable et d'environnement

Région du Centre

Bureau du district de Barrie
1201-54 chemin Cedar Pointe
Barrie ON L4N 5R7
Téléphone: (705) 739-6441
Sans frais: 1-800-890-8511
Téléc: (705) 739-6440

Ontario

June 7, 2023

The Corporation of the City of Barrie
70 Collier Street
Post Office Box No. 400
Barrie, Ontario
L4M 4T5

Attention: Stephanie Huyssen

Re: **Landfill Gas Barrie and Passive Venting System**
Proposed Amendments to Landfill Gas Monitoring Plan – ECA No. 3118-BD5KTE
Dyment's Creek Historic Waste Site No. 6, Barrie, Ontario

This letter is in response to the City of Barrie's ("City") April 28, 2023 request to the ministry for modifications to the monitoring and reporting requirements for the landfill gas cut-off wall and passive venting system located at historic waste Site No. 6 along Dyment's Creek near John and Frederick Streets, all as approved under Environmental Compliance Approval No. 3118-BD5KTE ("ECA"). Specifically, this request is to reduce the monitoring and reporting requirements as originally approved under Item 2.0 of the ECA.

The original landfill gas barrier and passive venting monitoring and reporting program was approved by the District Manager on February 24, 2020 in accordance with Condition 2.1 of the ECA.

Condition 2.3 of the ECA allows for the City upon the submission of the third Annual Report, with approval of the District Manager, to amend the monitoring and reporting requirements under the ECA. With the submission of the 2022 Annual Monitoring Report in March 2023 being the third Annual Report, the City requested amendments to the monitoring and reporting requirements as originally approved under Condition 2.1 of the ECA.

In support of this request the City provided the following documents:

- the letter dated April 28, 2023 from Stephanie Huyssen of the City of Barrie to Chris Hyde of the ministry entitled "Notification of Operation Under ECA 3118-BD5KTE & Sampling Modification Request, West End – Frederick St, Part of Lots 33, 34, 63 to 67, Part of Lots 32, 68 and 69, Part of Lots 25, 81 to 88, and Part of Lots 77 to 80, Reference Plan 493, City of Barrie, County of Simcoe";

- the report entitled “Dyment’s Creek Historic Waste Sites, 2022 Annual Monitoring Report” by WSP dated March 30, 2023 which provides a summary of the monitoring program for the Dyment’s Creek historic waste sites, including the monitoring required under the above noted ECA; and
- the email dated May 12, 2023 from Stephanie Huyssen of the City of Barrie to John Kaasalainen of the ministry confirming that soil gas probe GP-D23 will be included as part of the on-going landfill gas monitoring program.

As outlined in the supporting information, over the last three years monitoring of the landfill gas passive venting system has shown that the measured levels of all contaminants have been consistently low and that the modelled concentrations of all the measured contaminants have also been consistently less than 1% of their respective O.Reg. 419/05 air quality limits at the point of impingement (“POI”) locations. As a result, this is indicating that the system has and is operating in compliance with the requirements under O.Reg. 419/05 and the ECA.

Based on the ministry’s review of the aforementioned request and supporting information, and pursuant to Condition 2.3 of the ECA, I hereby amend the monitoring and reporting requirements under Condition 2.0 of the ECA to remove the requirements for on-going modelling of the air quality under Condition 2.2 of the ECA and to reduce the landfill gas monitoring and reporting requirements to the following:

Probe Location	Frequency	Parameter
Probes located within Waste: GP-D1; GP-D2; GP-D3; GP-D8; GP-D13; GP-D14	Semi- Annual Sampling (one frozen ground)	Methane Carbon Dioxide Oxygen Ground Water level
Probes located outside of Waste: GP-D20; GP-D21; GP-D23	Semi- Annual Sampling (one frozen ground)	Methane Carbon Dioxide Oxygen Ground Water level
Passive Gas Venting System: GVP1; GVP2; GVP3	Semi- Annual Sampling (one frozen ground)	Methane Carbon Dioxide Oxygen

In addition, the results of the on-going landfill gas monitoring program as outlined above shall be included in an annual report summarizing the results for the preceding year and be submitted to the District Manager by March 31 of each following year. This information can be included as part of the overall annual monitoring and reporting program being completed for the Dyment’s Creek Historic Waste Sites.

If you have any questions or require additional information/clarification please contact John Kaasalainen, P.Eng. of this office at (705) 309-4304 or by email at john.kaasalainen@ontario.ca.

Sincerely,

Chris Hyde
District Manager
Barrie District Office

wsp.com