COUNTY OF OXFORD

2022 DUE DILIGENCE MONITORING PROGRAMS

OXFORD COUNTY CLOSED LANDFILL SITES

JANUARY 16, 2023

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PROJECT NO.: 191-06761-02
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January 16, 2023

COUNTY OF OXFORD
Supervisor of Waste Management
Oxford County
21 Reeve St., PO Box 1614
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Attention: Pamela Antonio, MPA, BES

Dear Ms. Antonio,

Subject: 2022 Due Diligence Monitoring Programs, Oxford County

We are pleased to forward our report documenting the results of the 2022 Due Diligence Monitoring Programs for two (2) closed landfill sites in Oxford County.

The report provides a summary of the drilling and monitoring programs completed as part of the 2022 due diligence monitoring at the Blandford-Blenheim and Gunn's Hill Closed Landfill Sites. The report includes all details of the work program completed; presentation and discussion of the results of the monitoring completed; and conclusions and recommendations. Technical data are appended.

We trust that this information is sufficient for your current needs. If you have any questions or require further information, please contact us.

Yours sincerely,

Albert Siertsema, P.Eng., PMP
Project Engineer

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This limitations statement is considered an integral part of this report.

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1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by Oxford County to conduct an inventory of seven closed municipal landfill sites located throughout Oxford County. It is our understanding that this undertaking was initiated by the County for due diligence purposes.

The main project objectives were as follows:

- Review and catalogue the historical records and reports, search for and collect data from pertinent government agencies (e.g. Ministry of Environment, Conservation and Parks Freedom of Information Requests) and conduct site visits at the seven closed landfills owned by Oxford County;
- Report on the condition of the closed landfills' records, identify data gaps and potential for risk for each of the seven closed landfills; and
- Compile all findings and recommendations in a single report.

A single report, submitted to Oxford County in November 2019, was prepared based on all the information obtained during the records review and site visits. The report endeavoured to develop an understanding of the potential risks at each closed landfill site and the possible need for additional works, investigations and/or monitoring.

Based upon the report, Oxford County chose to proceed with recommended medium and high priority action items at the Lakeside, Embro, and Thamesford closed landfills in 2021, followed by Blandford-Blenheim and Gunn's Hill closed landfills in 2022.

A proposal to complete the due diligence monitoring program was submitted to Oxford County on October 20, 2021. This report provides a summary of the drilling and monitoring programs completed as part of the 2022 due diligence monitoring at the Blandford-Blenheim and Gunn's Hill Closed Landfill Sites. The report includes all details of the work program completed; presentation and discussion of the results of the monitoring completed; and conclusions and recommendations.

The locations of the closed landfill sites are provided on Figure 1.

2 BLANDFORD-BLENHEIM LANDFILL

The work program at the Blandford-Blenheim Landfill Site consisted of the following medium and high priority items identified during the inventory of the closed municipal landfills in Oxford County (WSP, 2019):

- Landfill Gas: Installation of a shallow gas probe at the property limit adjacent to the closest residential property (medium priority);
- Surface Water: Initiate a surface water sampling program at locations in the wetland/swampy areas around the Site, including an upgradient station off-site to the northwest and a downgradient station within the ponded area in the southeastern corner of the property (medium priority);
- Surface Water: Inspection of the southeastern corner of the property for the existence of a culvert connecting the landfill property with the adjoining property (medium priority);

- Groundwater: Drilling and monitoring well installation program at locations around the perimeter of the property to determine the shallow soil characteristics and to assess the shallow ground water quality and flow direction. Investigate the existing monitoring well observed on site for inclusion into the sampling program (medium priority); and
- Contact the neighbouring property to the west to determine information regarding their water use (well type, depth, etc.). Depending on the neighbour's water use, consideration should be given to sampling their water source (high priority).

2.1 GAS PROBE AND MONITORING WELL INSTALLATION

The drilling program was completed on January 18 and 19, 2022 by Direct Environmental Drilling using a track-mounted CME 75 equipped with 108 mm (4 ¼ inch) inside diameter, 215 (8 ½ inch) outside diameter hollow stem augers. Drill cuttings were contained on-site in the vicinity of the borehole location. WSP field staff were on-site to oversee the drilling and monitoring well installation activities. Borehole logs are provided in Appendix A-1.

Four boreholes were advanced through the overburden to depths ranging from 4.57 to 8.23 meters using 108 mm (4¼ inch) inside diameter hollow stem augers and a 51 mm (2 inch) diameter split spoon sampler. Soil samples from the borehole drilling were logged in the field and then returned to the office for detailed logging and review by senior staff.

The gas probe was constructed of 51 mm (2 inch) diameter PVC riser pipe and slotted 3.05 m (10 foot) screen. The borehole annulus around the well screen was filled with No. 2 clean silica sand to 0.46 m above the well screen to provide a filter pack. The remainder of the borehole annulus was sealed with bentonite to surface. A lockable protective steel casing was installed at the surface.

The groundwater monitoring wells were constructed of 51 mm (2 inch) diameter PVC riser pipe and slotted 1.52 m (5 foot) screens, with 0.15 m (6 inch) slotted cone tips (sumps). The borehole annulus around the each well screen was filled with No. 2 clean silica sand to 0.61 m above the well screen to provide a filter pack. The remainder of each borehole annulus was sealed with bentonite to surface. Lockable protective steel casings were installed at the surface, for each monitoring well.

Monitor construction details for the gas probe and monitoring wells are summarized below:

Monitor Designation	Monitor Diameter	Ground Surface	Screened Interval	Filter Pack	Seal
	mm	mASL	mbgs	mbgs	mbgs
BB-GP1	51	304.20	1.52 – 4.57	1.07 – 4.57	0.00 – 1.07
BB-MW1	51	299.27	5.72 – 7.39	5.11 – 7.44	0.00 – 5.11
BB-MW2	51	302.97	6.45 – 8.13	5.84 – 8.23	0.00 – 5.84
BB-MW3	51	304.44	6.43 – 8.10	5.82 – 8.23	0.00 – 5.82

Notes: mASL – metres above sea level.
mbgs – metres below ground surface

The monitors were installed for the purpose of assessing landfill gas migration from the refuse and to assess the shallow groundwater quality and flow direction. The gas probe (BB-GP1) was installed within the unsaturated zone northwest of the refuse and east of the adjacent residential property. The shallow groundwater monitors were installed near the northwest, southwest and eastern boundaries of the Site, as shown on Figure 2-1.

A Ministry of the Environment, Conservation and Parks (MECP) well tag was affixed to one of the monitor installations and a single cluster well record was submitted to the MECP in accordance with O.Reg. 903. A survey of the reference elevations for the new monitors was completed by Oxford County.

Following completion of the new monitoring wells, dedicated sampling equipment was installed. The wells were developed to promote hydraulic connection to the geologic formations, to remove fine-grained material from the area of the well screen, and to ensure that the adjacent groundwater was representative of natural conditions.

2.2 MONITORING PROGRAM AND RESULTS

The monitoring program for the Blandford-Blenheim Landfill was based upon the recommendations that were provided in the Inventory of Closed Municipal Landfill Sites Report, completed by WSP in November 2019. These tasks included the following monitoring events:

- Gas monitoring of probe BB-GP1, BB-MW1, BB-MW2, BB-MW3, BB-BH1-1, and BB-BH1-2 on February 15, July 13, October 18, and December 12, 2022;
- Surface water monitoring at BB-SW1, BB-SW2, and BB-SW3 on March 22 and October 18, 2022;
- Groundwater sampling at BB-MW1, BB-MW2, BB-MW3, BB-BH1-1, and BB-BH1-2 in April and October/November 2022;
- Groundwater level monitoring at all on-site monitors during each monitoring event; and
- Private well monitoring at a residential property located at 846635 Township Road 9 (BB-P1) in April 2022.

The location of the landfill gas monitoring probe is shown on Figure 2-1. The gas monitoring was completed using an Elkins Earthworks Envision Landfill Gas Monitor. A groundwater level measurement was collected immediately following the gas measurement within the gas probe.

Surface water sampling was completed during the spring and fall at three surface water locations, as shown on Figures 2-1 and 2-2. It is noted that the each of the locations were not flowing (stagnant) or dry at the time of the sampling events. The samples were obtained directly from the surface water source at each monitoring location and submitted to SGS Canada Inc., located in Lakefield, Ontario.

Groundwater monitoring and sampling was completed during the spring and fall at the five groundwater monitoring wells, as shown on Figures 2-1 and 2-2. The samples were submitted to SGS Canada Inc. located in Lakefield, Ontario.

The private well sampling was completed during the spring at the residential property to the northwest of the landfill property, as shown on Figure 2-1. In discussions with the private well owner, the well was reported to be a dug well with a depth of approximately 40 foot (12.2 m). The presumed water well record was located and obtained from the MECP well record database, which is a database providing information from well contractors as prescribed by O.Reg. 903 and stored in the Water Well Information System (WWIS). The presumed water well record for the private well is provided in Appendix A-1. The owner mentioned that the well had been cleaned (sediment removal)

within the last five years. The sample was obtained from a tap located outside of the corner of the garage, prior to any water treatment systems (e.g. UV treatment, filters, softeners, etc.).

2.2.1 LANDFILL GAS

As identified in the Inventory of Closed Municipal Landfill Sites Report, completed by WSP in November 2019, monitoring for combustible gas was completed at various times (at least once each season) for a year. Monitoring occurred during the late winter/early spring (February 15, 2022), summer (July 13, 2022), fall (October 18, 2022) and early winter (December 12, 2022). Monitoring occurred in February and December 2022 to correspond to frozen ground conditions, as landfill gas preferentially migrates horizontally when the ground is frozen and cannot escape vertically in the vicinity of the waste. The combustible gas monitoring results are presented in Table 5.

Groundwater elevations were completed to ensure that the screen of gas probe BB-GP1 remained unsaturated, to allow the gas to accumulate in the gas probe. The monitor's well screen was not submerged for any of the monitoring events. Landfill gas monitoring and groundwater elevations were also collected within monitoring wells BB-MW1, BB-MW2 and BB-MW3, although these monitors' well screens were submerged for each of the monitoring events in 2022. Landfill gas monitoring and groundwater elevations were also collected within existing monitoring wells BB-BH1-1 and BB-BH1-2, but as the monitoring well details are unknown for these wells, it cannot be confirmed if the monitors' well screens were submerged or not.

During both frozen and unfrozen ground conditions, combustible gas was not detected at any of the monitors during the monitoring period. These results indicate that landfill gas does not appear to be present or migrating away from the property boundary, particularly toward the residential property to the northwest. Given the age and size of the landfill, it is unlikely that landfill gas will pose a risk to neighbouring properties. As such, further landfill gas monitoring is not recommended.

2.2.2 SURFACE WATER

SURFACE WATER FLOW

During the March 2022 sampling event at the Site, there was no apparent surface water flow (stagnant) at the designated monitoring stations. During the fall sampling event in October 2022, each of the stations were completely dry.

Some surface drainage from the refuse mound appears to collect in the wetland/swampy area in the southeastern corner of the Site (BB-SW2), which is assumed to drain to the adjoining swampland to the east (BB-SW3). An inspection of the southeastern corner of the property was also completed, to attempt to find the culvert that is presumed to connect the landfill property with the adjoining property. This culvert was unable to be found.

Station BB-SW1 is located within a wetland/swampy area to west of the Site and represents an upgradient location. There was also no surface water flow at this upgradient location in 2022.

SURFACE WATER QUALITY

Project quality assurance and control (QA/QC) was performed through each stage of sampling and analysis. QA/QC during data collection was ensured through the use of standard monitoring protocols and procedures. Field

equipment was calibrated regularly. Water samples collected in the field were placed in coolers with ice to maintain a constant temperature of about 4°C and delivered or couriered to the laboratory at the end of the day.

Analytical results for the field QA/QC sampling completed during the surface water sampling program were evaluated for the relative percent difference (RPD) of parameter concentrations. For concentrations greater than five times the reported detection limit (RDL), a concentration difference of less than or equal to 20% was deemed acceptable. For concentrations less than or equal to five times the RDL, a concentration difference of equal to or less than twice the RDL was deemed acceptable.

Laboratory reports were reviewed as part of the laboratory QA/QC program. The surface water duplicate sample results are provided in Table 4. The RPDs between the blind duplicates and original samples collected on March 22, 2022, were acceptable for the tested constituents, with the exception of cadmium (33% RPD) and chromium (26% RPD) at station BB-SW2.

The laboratory was consulted to validate the original and duplicate results for the samples noted above. The laboratory's response indicated that these concentrations were within acceptable laboratory QA/QC ranges and the chemical results stand.

The surface water samples were analyzed for parameters that are typically associated with municipal landfills, as listed in Schedule 5, Column 3 of the Landfill Standards guideline (MECP, 2012). Copies of the laboratory certificates of analysis are provided in Appendix B, with summarized field and laboratory results presented in Table 3.

Concentrations of typical landfill related parameters were compared between downgradient surface water quality at BB-SW2 and BB-SW3 to upgradient surface water quality at BB-SW1. In the spring of 2022, parameter concentrations generally increased in concentration moving from BB-SW1 to BB-SW2 and again to BB-SW3, indicating that the landfill may be influencing surface water quality. However, it is noted that chloride concentrations were lower at downstream BB-SW2 compared to upstream BB-SW1. Surface water was unable to be sampled in October 2022 due to dry conditions at the three stations. Concentrations of phenols at BB-SW2, un-ionized ammonia at BB-SW3, and iron at BB-SW2 and BB-SW3 exceeded their respective Provisional Water Quality Objective (PWQO) in March 2022. It is noted that further downstream at BB-SW3 (located on the adjoining swampland to the east) the phenols concentration no longer exceeded the PWQO.

Although several parameters exceeded the PWQO at the downstream surface water locations, it is plausible that these exceedances were the result of the stagnant wetland conditions at these locations. The general increase of parameter concentrations from the upstream to downstream locations does suggest that the landfill may be partially influencing surface water quality. Nonetheless, as the surface water stations were ephemeral in 2022 (dry in the fall), the downstream impact appears to be minimal. Additional surface water monitoring is recommended to corroborate these ephemeral conditions, and to determine whether the landfill is impacting downstream surface water quality.

2.2.3 GROUNDWATER

GROUNDWATER FLOW

According to the local Source Water Protection assessments, groundwater flow in the vicinity of the of the Site is inferred to flow towards the east to southeast. Based on the groundwater elevation measurements completed, the

groundwater flow direction of the shallow overburden matches the Source Water Protection assessment. The groundwater table elevations measured in April 2022 and the interpreted shallow groundwater table contours are presented on Figure 2-3.

As per the inferred groundwater flow direction, the groundwater quality observed at monitoring well BB-MW3 is considered representative of background/upgradient groundwater conditions, while the remaining monitoring wells are considered downgradient of the Site.

GROUNDWATER QUALITY

Project QA/QC was performed through each stage of sampling and analysis. QA/QC during data collection was ensured through the use of standard monitoring protocols and procedures. Field equipment was calibrated regularly. Water samples collected in the field were placed in coolers with ice to maintain a constant temperature of about 4°C and delivered or couriered to the laboratory at the end of the day.

Analytical results for the field QA/QC sampling completed during the groundwater sampling program were evaluated for the relative percent difference (RPD) of parameter concentrations. For concentrations greater than five times the reported detection limit (RDL), a concentration difference of less than or equal to 20% was deemed acceptable. For concentrations less than or equal to five times the RDL, a concentration difference of equal to or less than twice the RDL was deemed acceptable.

Laboratory reports were reviewed as part of the laboratory QA/QC program. The groundwater duplicate sample results are provided in Table 2. The RPDs between the blind duplicates and original samples collected on April 11 and October 18, 2022 were acceptable for the tested constituents, with the exception of chromium (36% RPD) at BB-P1 in April 2022. The laboratory was consulted to validate the original and duplicate results for the samples noted above. The laboratory's response indicated that these concentrations were within acceptable laboratory QA/QC ranges and the chemical results stand.

The groundwater samples were analyzed for parameters that are typically associated with municipal landfills as listed in Schedule 5, Column 1 of the Landfill Standards guideline (MECP, 2012). Copies of the laboratory certificates of analysis are provided in Appendix B, with summarized field and laboratory results presented in Table 1.

Parameter concentrations in the groundwater samples collected were generally highest at monitor BB-BH1-2 located within the landfill footprint, followed by concentrations at monitor BB-MW1 located downstream in the east corner of the Site. Concentrations at monitors BB-BH1-1 and BB-MW2 were also generally elevated compared to background concentrations at monitor BB-MW3, but less elevated than at monitors BB-BH1-2 and BB-MW1. Manganese concentrations at BB-BH1-1 were similar to BB-BH1-2 in April and greater than BB-BH1-2 in October/November.

Concentrations of volatile organic compounds (VOCs) were detected within the groundwater at monitor BB-BH1-2 for benzene, toluene and 1,4-dichlorobenzene during both 2022 monitoring events. VOCs were not detected in any of the other groundwater monitors.

It is noted that nested monitors BB-BH1-1 and BB-BH1-2 are existing monitoring wells within the landfill footprint, that were identified during the inventory of the closed municipal landfills in Oxford County (WSP, 2019). Well details were not available for these monitoring wells, but dedicated sampling equipment was installed by WSP in the spring of 2022 and the wells were developed to promote hydraulic connection to ensure that the adjacent

groundwater was representative of natural conditions. Well depths were recorded after development of these wells. It is apparent that monitor BB-BH1-2 is a shallow monitoring well, likely installed within the refuse, and is representative of the leachate quality at the Site. Monitor BB-BH1-1 is a deeper monitoring well, assumed to be installed below the refuse. Therefore, the elevated parameter concentrations at monitor BB-BH1-2 can be considered representative of leachate at the Site.

ONTARIO DRINKING WATER QUALITY STANDARDS

A review of the groundwater quality results indicates that all the parameters analyzed were within the ODWQS during 2022, with the exception of:

- Total dissolved solids (TDS), dissolved organic carbon (DOC), alkalinity and iron at monitors BB-MW1 and BB-BH1-2;
- Manganese at monitors BB-MW1, BB-BH1-1 and BB-BH1-2; and
- Benzene and 1-4-dichlorobenzene at BB-BH1-2.

All of the above exceedances occurred during both the spring and fall monitoring events, with the exception of alkalinity at BB-MW1 which only exceeded in April 2022.

As discussed above, BB-BH1-2 is likely installed within the refuse and is representative of the leachate quality at the Site.

TDS, DOC, iron, manganese and 1,4-dichlorobenzene have objectives or guidelines related to the aesthetic quality of the water and are not health related. Alkalinity is an operational guideline and is also not health related.

GUIDELINE B-7 COMPLIANCE ASSESSMENT

Guideline B-7 (GB-7) was established by the MECP as a mechanism to assess the acceptable level of leachate impacts on the groundwater system. Guideline B-7 is applied to groundwater quality at the property boundary, and is intended to protect both existing and potential reasonable uses of the groundwater on adjacent properties. The Guideline states that, for non-health related parameters, the impact from the landfill should not raise the concentration by more than half the difference between the background concentration and the ODWQS. For health related parameters, the impact from the landfill should not raise the concentration by more than quarter the difference between the background concentration and the ODWQS.

GB-7 criteria were calculated for parameters that have ODWQS. The groundwater chemistry results from background monitor BB-MW3 were used as reference concentrations for the calculations.

Table 6 provides a comparison of the calculated Guideline B-7 criteria and downgradient shallow wells on Site.

In summary, concentrations at the landfill property boundary complied with the GB-7 criteria, with the exception of:

- TDS at monitors BB-MW1 and BB-MW2 in April and October 2022;
- DOC, alkalinity, barium at monitor BB-MW1 in April and October 2022; and
- Iron and manganese at monitor BB-MW1 in April and October 2022 and monitor BB-MW2 in April 2022.

It is noted that most of these parameters have objectives or guidelines related to the aesthetic quality (TDS, DOC, iron and manganese) or operational treatment (alkalinity) of the water, and are not health related. Barium, which is

a health related criterion, exceeded the GB-7 criteria at BB-MW1 in April and October 2022. The concentration of barium detected at BB-MW1, however, was below the ODWQS criteria.

Based on the groundwater quality results, there is evidence of landfill impact to the shallow groundwater at the Site, particularly at eastern boundary well BB-MW1. This shallow groundwater may also influence the surface quality within the wetland areas to the east of the Site. It is noted that the adjacent property directly to the east of the Site was confirmed to be owned by Oxford County (WSP, 2019), and could be considered a buffer for landfill impacts to the east. If further lands to the east/southeast become available, the County may want to consider purchasing them for additional buffer and natural attenuation of shallow groundwater and surface water. Continued groundwater monitoring of the wells on-site may be prudent, to monitor for any changing parameter concentration trends.

2.2.4 PRIVATE WELL

Project QA/QC was performed through each stage of sampling and analysis. QA/QC during data collection was ensured through the use of standard monitoring protocols and procedures. Field equipment was calibrated regularly. Water samples collected in the field were placed in coolers with ice to maintain a constant temperature of about 4°C and delivered or couriered to the laboratory at the end of the day.

The private well groundwater sample was analyzed for parameters that are typically associated with municipal landfills as listed in Schedule 5, Column 1 of the Landfill Standards guideline (MECP, 2012). Copies of the laboratory certificates of analysis are provided in Appendix B, with summarized field and laboratory results presented in Table 1.

A review of the groundwater quality results indicates that all the parameters analyzed were within the Ontario Drinking Water Quality Standards (ODWQS) (MECP, revised June 2006). Concentrations of volatile organic compounds were not detected in the groundwater sample.

In summary, groundwater quality within the private well tested did not show evidence of a leachate influence. Given these results, further groundwater monitoring of the private water well is not recommended.

3 GUNN'S HILL LANDFILL

The work program at the Gunn's Hill Landfill Site consisted of the following priority items identified during the inventory of the closed municipal landfills in Oxford County (WSP, 2019):

- Landfill Gas: Installation of shallow gas probes at the property limits adjacent to the residential properties to the west and east (medium priority);
- Shallow Groundwater / Surface Water: Inspection of the south/southwest slope of the landfill for leachate seeps during periods of high ground saturation, such as late winter, early spring and late fall. If leachate seeps are observed, initiate a sampling program that includes sampling the seeps and the upstream and downstream wetland areas, to the south and west, respectively (high priority); and
- Contact the neighbouring properties to the west and east to determine information regarding their water use (well type, depth etc.). Depending on the neighbour's water use, consideration should be given to sampling their water source (medium priority).

3.1 GAS PROBE INSTALLATION PROGRAM

The drilling program was completed on January 19, 2022 by Direct Environmental Drilling using a track-mounted CME 75 equipped with 108 mm (4 ¼ inch) inside diameter, 215 (8 ½ inch) outside diameter hollow stem augers. Drill cuttings were contained on-site in the vicinity of the borehole location. WSP field staff were on-site to oversee the drilling and monitoring well installation activities. Borehole logs are provided in Appendix A-2.

Two boreholes were advanced through the overburden to a depth of 3.05 meters using 108 mm (4¼ inch) inside diameter hollow stem augers and a 51 mm (2 inch) diameter split spoon sampler. Soil samples from the borehole drilling were logged in the field and then returned to the office for detailed logging and review by senior staff.

The gas probes were constructed of 51 mm (2 inch) diameter PVC riser pipe and slotted 2.13 m (7 foot) screens. The borehole annulus around each well screen was filled with No. 2 clean silica sand to 0.30 m above the well screen to provide a filter pack. The remainder of the borehole annulus was sealed with bentonite to surface. A lockable protective steel casing was installed at the surface.

Monitor construction details for the gas probes are summarized below:

Monitor Designation	Monitor Diameter	Ground Surface	Screened Interval	Filter Pack	Seal
	mm	mASL	mbgs	mbgs	mbgs
GH-GP1	51	319.59	0.91 – 3.05	0.61 – 3.05	0.00 – 0.61
GH-GP2	51	312.57	0.91 – 3.05	0.61 – 3.05	0.00 – 0.61

Notes: mASL – metres above sea level.
mbgs – metres below ground surface

The monitors were installed for the purpose of assessing landfill gas migration from the refuse. The monitors were installed on the property boundary within the unsaturated zone on the east and west sides of the refuse mound, adjacent to the closest residential properties, as shown on Figures 3-1 and 3-2.

A survey of the reference elevations for the new monitors was completed by Oxford County.

3.2 MONITORING PROGRAM AND RESULTS

The monitoring program for the Gunn's Hill Landfill was based upon the recommendations that were provided in the Inventory of Closed Municipal Landfill Sites Report, completed by WSP in November 2019. These tasks included the following monitoring events:

- Gas monitoring of probe GH-GP1 and GH-GP2 on February 15, July 13, October 17, and December 12, 2022;
- Water level monitoring within the gas probes during gas monitoring events;
- Inspection of the south/southwest slopes of the landfill for seeps on February 15, March 22, March 30, April 11, July 13, October 17, and December 12; and

- Private well monitoring at three residential properties located on Gunn's Hill Road, at property numbers 445300 (GH-P1), 445297 (GH-P2) and 445262 (GH-P3A and GH-P3B).

The locations of the landfill gas monitoring probes are illustrated on Figures 3-1 and 3-2. The gas monitoring was completed using an Elkins Earthworks Envision Landfill Gas Monitor. Groundwater levels were collected immediately following the gas measurements within the gas probes.

The private well sampling was completed during the spring at the residential properties adjacent to the landfill property, as shown on Figure 3-1. In discussions with the private well owners, well construction details (well type, depth, etc.) were not readily available or known, but each well owner was willing to provide access to sample each well. The presumed water well records were located and obtained from the MECP well record database, following the sampling. The presumed water well records for the private wells are provided in Appendix A-2, and general construction details are summarized in the table below:

Water Well Record Designation	WSP Designation	Address	Date Constructed	Depth Completed	
				feet bgs	mbgs
4703235	GH-P1	445300 Gunn's Hill Road	August 17, 1971	213	64.9
4705875	GH-P2	445297 Gunn's Hill Road	April 24, 1986	248	75.6
7250526 (A188068)	GH-P3A	445262 Gunn's Hill Road	September 21, 2015	48	14.6
4706517	GH-P3B		December 6, 1989	40	12.2

The samples were obtained from the residences prior to any water treatment systems (e.g. UV treatment, filters, softeners, etc.).

3.2.1 LANDFILL GAS

As identified in the Inventory of Closed Municipal Landfill Sites Report, completed by WSP in November 2019, monitoring for combustible gas was completed at various times (at least once each season) for a year. Monitoring occurred during the late winter/early spring (February 15, 2022), summer (July 13, 2022), fall (October 17, 2022) and early winter (December 12, 2022). Monitoring occurred in February and December 2022 to correspond to frozen ground conditions, as landfill gas preferentially migrates horizontally when the ground is frozen and cannot escape vertically in the vicinity of the waste. The combustible gas monitoring results are presented in Table 5.

Groundwater elevations were completed to ensure that the screens of the two probes remained unsaturated to allow the gas to accumulate in the gas probes. The monitor well screens were not submerged during the monitoring events.

During both frozen and unfrozen ground conditions, combustible gas was not detected at monitors GH-GP1 or GH-GP2 during the monitoring period. These results indicate that landfill gas does not appear to be present or migrating towards the residential properties. Given the age and size of the landfill, it is unlikely that landfill gas will pose a risk to neighbouring properties. As such, further landfill gas monitoring is not recommended.

3.2.2 SEEP INSPECTION / SURFACE WATER

As noted earlier, inspection of the south/southwest slopes of the landfill for seeps occurred on February 15, March 22, March 30, July 13, October 17, and December 12. Attempts were made to attend the inspections on dates of high ground saturation (particularly in the spring), to maximize the chances of witnessing any seeps.

During each of these inspections, no seeps were discovered. As such, the surface water quality monitoring program was not initiated. It is noted that any surface water flow through the proposed surface water stations (both upstream and downstream) appears to be very ephemeral. During the inspection of the Site for seeps, no downstream surface water flow was visible from the Site.

Considering the ephemeral surface water flow, very little impact is anticipated from any surface water runoff from the site. Given these results, further surface water monitoring is not recommended.

3.2.3 PRIVATE WELLS

Project QA/QC was performed through each stage of sampling and analysis. QA/QC during data collection was ensured through the use of standard monitoring protocols and procedures. Field equipment was calibrated regularly. Water samples collected in the field were placed in coolers with ice to maintain a constant temperature of about 4ºC and delivered or couriered to the laboratory at the end of the day.

Analytical results for the field QA/QC sampling completed during the sampling program were evaluated for the relative percent difference (RPD) of parameter concentrations. For concentrations greater than five times the reported detection limit (RDL), a concentration difference of less than or equal to 20% was deemed acceptable. For concentrations less than or equal to five times the RDL, a concentration difference of equal to or less than twice the RDL was deemed acceptable.

Laboratory reports were reviewed as part of the laboratory QA/QC program. The groundwater duplicate sample results are provided in Table 2. The RPDs between the blind duplicate and original sample collected on April 11, 2022, were acceptable for the tested constituents, with the exception of sulphate (37% RPD) and copper (96%) at GH-P1. The laboratory was consulted to validate the original and duplicate results for the samples noted above. The laboratory's response indicated that these concentrations were within acceptable laboratory QA/QC ranges and the chemical results stand.

The four private well groundwater samples were analyzed for parameters that are typically associated with municipal landfills as listed in Schedule 5, Column 1 of the Landfill Standards guideline (MECP, 2012). Copies of the laboratory certificates of analysis are provided in Appendix B, with summarized field and laboratory results presented in Table 1.

A review of the groundwater quality results indicates that all the parameters analyzed were within the Ontario Drinking Water Quality Standards (ODWQS) (MECP, revised June 2006), with the exception of iron concentrations at each of the private wells, and manganese at GH-P3A. Iron is a naturally occurring parameter in groundwater and commonly exceeds the ODWQS. As iron exceeded the ODWQS at each of the locations at a similar concentration, it is apparent that iron-rich water is prevalent within the background water quality in the area. The ODWQS for this parameter relates to an aesthetic objective for water quality; therefore, it does not represent a health concern. The

manganese concentration at GH-P3A (0.0527 mg/L) was only marginally above the ODWQS of 0.05 mg/L, and also relates to an aesthetic objective for water quality; therefore, it does not represent a health concern.

Concentrations of volatile organic compounds were not detected in the groundwater samples.

The remaining parameter concentrations at GH-P1, GH-P2, GH-3A and GH-3B in April 2022 were relatively similar and below the ODWQS. In summary, groundwater quality within the private wells tested did not show evidence of a leachate influence. Given these results, further groundwater monitoring is not recommended.

4 CONCLUSIONS AND RECOMMENDATIONS

This report provides a summary of the drilling and monitoring programs completed as part of the 2022 due diligence monitoring at the Blandford-Blenheim and Gunn's Hill Closed Landfill Sites

The program was based upon the medium and high potential risks identified in the Inventory of Closed Municipal Landfill Sites Report, completed by WSP in November 2019.

BLANDFORD-BLENHEIM LANDFILL

Potential risks identified for the Blandford-Blenheim Landfill included:

- Landfill Gas (medium priority);
- Surface Water (medium priority);
- Groundwater (medium priority); and
- Private Wells / Domestic Groundwater (high priority).

Based on the monitoring program completed at the Blandford-Blenheim Landfill, the monitoring results do not appear to indicate landfill impacts via landfill gas movement, however continued monitoring is recommended to observe parameter concentration trends of potential historic landfill impacts to the surface water and shallow groundwater to the east of the Site.

GUNN'S HILL LANDFILL

Potential risks identified for the Gunn's Hill Landfill included:

- Landfill Gas (medium priority);
- Shallow Groundwater / Surface Water (high priority); and
- Private Wells / Domestic Groundwater (medium priority).

Based on the monitoring program completed at the Gunn's Hill Landfill, the monitoring results do not appear to indicate landfill impacts via landfill gas movement, leachate seeps (shallow groundwater/surface water) or to domestic well groundwater quality. Given the results presented within this report, further monitoring is not recommended at this time.

5 REFERENCES

Ministry of the Environment, 1994. *Water Management Policies, Guidelines, Provincial Water Quality Objectives of the Ministry of Environment and Energy*; July 1994. Reprinted February 1999.

Ministry of the Environment, 2004. *Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines*. Revised June 2006.

Ministry of the Environment, 2012. *Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites.* January 2012.

WSP Canada Inc., 2019. *Oxford County: Inventory of Closed Municipal Landfill Sites.* November 2019.

TABLES

Table 1: Groundwater Chemistry Results
Oxford County Closed Landfill Sites

Parameter	ODWQS	Blandford-Blenheim Landfill										
		BB-MW1		BB-MW2		BB-MW3		BB-BH1-1		BB-BH1-2		BB-P1
		11-Apr-22	18-Oct-22	11-Apr-22	18-Oct-22	11-Apr-22	18-Oct-22	18-Apr-22	25-Nov-22	18-Apr-22	25-Nov-22	11-Apr-22
pH (field - pH units)	6.5 - 8.5 OG	6.98	6.97	6.78	7.25	6.89	7.51	6.89	6.94	6.75	6.65	7.38
Conductivity (field - µS/cm)		1070	1000	595	634	351	382	740	671	2050	2100	527
Temperature (field - °C)	15 AO	8.35	11.10	8.52	10.11	9.25	10.29	9.7	9.60	9.3	9.75	4.58
pH (lab - pH units)	6.5 - 8.5 OG	7.93	8.16	8.13	8.09	8.20	8.16	7.86	7.72	7.15	7.20	8.08
Conductivity (lab - µS/cm)		1190	1080	651	627	381	372	573	687	2110	2100	557
Total Dissolved Solids	500 AO	**617**	**574**	420	394	234	206	331	369	**780**	**820**	346
Chemical Oxygen Demand		30	23	11	<8	<8	<8	<8	20	116	131	<8
Dissolved Organic Carbon	5 AO	**9.3**	**8**	1.1	3	1.3	<1	2	1.8	**27**	**30.5**	1.5
Alkalinity	30 - 500 OG	**597**	498	248	231	213	202	304	334	**1150**	**1070**	295
Chloride	250 AO	48	79	27	37	3	0.9	15	15	31	37	2
Sulphate	500 AO	22	24	73	82	7	3.5	12	4	<2	<20	5
Calcium		118	101	90.5	73.6	56.3	52.3	92.4	111	184	195	82.3
Magnesium		45.5	37.4	31.1	23.8	10.9	8.97	18.9	18.4	48.9	40.7	22.4
Sodium	200 AO	35.4	29.0	5.02	3.85	13.2	4.50	4.30	3.90	50.4	31.9	4.94
Potassium		15.4	9.69	1.34	1.16	0.833	0.652	3.81	4.56	70.4	60.7	5.12
Total Kjehldahl Nitrogen		24.6	16.2	<0.5	<0.5	1.6	<0.5	2.46	2.00	122	99.2	<0.5
Ammonia		23.9	15.2	0.2	0.1	<0.1	<0.1	<0.1	1.8	112	100	<0.1
Nitrate	10.0 MAC	<0.06	<0.06	0.70	0.45	0.34	0.32	2.53	0.56	<0.06	<0.06	5.28
Nitrite	1.0 MAC	<0.03	<0.03	0.14	0.11	<0.03	<0.03	<0.03	0.07	<0.3	<0.3	<0.03
Total Phosphorus		0.73	0.26	0.05	<0.03	<0.03	0.06	0.12	0.16	0.60	0.58	<0.03
Phenols		<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	0.008	0.016	<0.002
Arsenic	0.01 MAC	0.0005	0.0003	0.0011	0.0007	0.0009	0.0003	0.0004	0.0004	0.0014	0.0016	<0.0002
Barium	1.0 MAC	0.519	0.358	0.0633	0.0613	0.0104	0.00835	0.0398	0.0561	0.217	0.278	0.0304
Boron	5.0 IMAC	0.176	0.103	0.013	0.007	0.018	0.005	0.125	0.063	0.765	0.750	0.045
Cadmium	0.005 MAC	<0.000003	<0.000003	0.000005	<0.000003	0.000003	0.000010	0.000137	0.000004	0.000003	0.000010	0.000007
Chromium	0.05 MAC	0.00064	0.00044	0.00014	0.00013	0.00057	0.00037	0.00014	0.00019	0.00376	0.00377	0.00096
Copper	1 AO	0.0003	<0.0002	0.0008	<0.0002	0.0011	0.0006	0.0022	0.0010	0.0006	0.0008	0.0048
Iron	0.3 AO	**3.84**	**3.28**	0.198	0.095	<0.007	<0.007	0.045	0.08	**44.3**	**73.5**	<0.007
Lead	0.010 MAC	<0.00009	<0.00009	0.00019	<0.00009	<0.00009	<0.00009	0.00014	<0.001	<0.00009	<0.001	0.00017
Manganese	0.05 AO	**0.0972**	**0.0636**	0.0318	0.0190	0.00477	0.00041	**0.657**	**0.852**	**0.701**	**0.548**	0.00024
Mercury	0.001 MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Zinc	5.0 AO	0.002	<0.002	0.004	<0.002	0.003	<0.002	0.026	0.011	0.011	0.007	0.218
Benzene (µg/L)	1 MAC	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**5.9**	**5.7**	<0.5
1,4 - Dichlorobenzene (µg/L)	5 MAC, 1 AO	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**2.6**	**3.2**	<0.5
Dichloromethane (µg/L)	50 MAC	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene (µg/L)	60 MAC, 24 AO	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	1.2	<0.5
Vinyl Chloride (µg/L)	1 MAC	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Notes:
- All units in mg/L unless otherwise noted
- ODWQS - Ontario Drinking Water Quality Standard (June 2003)
- Bold values indicate exceedance of ODWQS
- All units in mg/L unless otherwise noted
- µS/cm - microSiemens per centimetre
- °C - degrees Celsius
- µg/L - micrograms per litre
- MAC - Maximum Acceptable Concentration
- IMAC - Interim Maximum Acceptable Concentration
- AO - Aesthetic Objective
- OG - Operational Guideline
- <value - parameter not detected above associated laboratory reported detection limit
- dry - sampling location dry at the time of sampling
- - or blank - parameter not analysed during sampling event

Table 1: Groundwater Chemistry Results
Oxford County Closed Landfill Sites

Parameter	ODWQS	Gunn's Hill Landfill			
		GH-P1	GH-P2	GH-P3A	GH-P3B
		11-Apr-22	11-Apr-22	11-Apr-22	11-Apr-22
pH (field - pH units)	6.5 - 8.5 OG	6.99	7.05	6.89	6.98
Conductivity (field - µS/cm)		429	439	483	472
Temperature (field - °C)	15 AO	13.26	10.99	11.20	11.68
pH (lab - pH units)	6.5 - 8.5 OG	8.04	8.00	8.04	8.01
Conductivity (lab - µS/cm)		462	493	517	525
Total Dissolved Solids	500 AO	223	260	337	303
Chemical Oxygen Demand		<8	<8	<8	8
Dissolved Organic Carbon	5 AO	1.0	<1.0	<1.0	1.3
Alkalinity	30 - 500 OG	254	267	244	246
Chloride	250 AO	2	4	8	8
Sulphate	500 AO	16	18	54	54
Calcium		61.9	65.4	78.9	74.8
Magnesium		22.9	24.0	24.3	23.5
Sodium	200 AO	15.0	15.2	4.04	3.83
Potassium		1.07	1.20	1.02	0.968
Total Kjehldahl Nitrogen		<0.5	<0.5	<0.5	<0.5
Ammonia		0.3	0.2	<0.1	<0.1
Nitrate	10.0 MAC	<0.06	<0.06	<0.06	0.6
Nitrite	1.0 MAC	<0.03	<0.03	<0.03	<0.03
Total Phosphorus		<0.03	<0.03	<0.03	<0.03
Phenols		<0.002	<0.002	<0.002	<0.002
Arsenic	0.01 MAC	0.0054	0.0004	0.0028	0.0046
Barium	1.0 MAC	0.131	0.179	0.186	0.194
Boron	5.0 IMAC	0.052	0.050	0.009	0.019
Cadmium	0.005 MAC	0.000003	<0.000003	0.000003	<0.000003
Chromium	0.05 MAC	0.00022	0.00009	0.00024	0.00010
Copper	1 AO	0.0017	0.0019	0.0029	0.0012
Iron	0.3 AO	**1.43**	**1.10**	**1.00**	**1.05**
Lead	0.010 MAC	<0.00009	<0.00009	<0.00009	<0.00009
Manganese	0.05 AO	0.0268	0.0223	**0.0527**	0.0341
Mercury	0.001 MAC	<0.00001	<0.00001	<0.00001	<0.00001
Zinc	5.0 AO	0.007	<0.002	0.018	0.026
Benzene (µg/L)	1 MAC	<0.5	<0.5	<0.5	<0.5
1,4 - Dichlorobenzene (µg/L)	5 MAC, 1 AO	<0.5	<0.5	<0.5	<0.5
Dichloromethane (µg/L)	50 MAC	<0.5	<0.5	<0.5	<0.5
Toluene (µg/L)	60 MAC, 24 AO	<0.5	<0.5	<0.5	<0.5
Vinyl Chloride (µg/L)	1 MAC	<0.2	<0.2	<0.2	<0.2

Notes:
- All units in mg/L unless otherwise noted
- ODWQS - Ontario Drinking Water Quality Standard (June 2003)
- Bold values indicate exceedance of ODWQS
- All units in mg/L unless otherwise noted
- µS/cm - microSiemens per centimetre
- °C - degrees Celsius
- µg/L - micrograms per litre
- MAC - Maximum Acceptable Concentration
- IMAC - Interim Maximum Acceptable Concentration
- AO - Aesthetic Objective
- OG - Operational Guideline
- <value - parameter not detected above associated laboratory reported detection limit
- dry - sampling location dry at the time of sampling
- - or blank - parameter not analysed during sampling event

Table 2: Summary of Groundwater Duplicate Sample Results
Oxford County Closed Landfill Sites

Parameter	Unit	RDL	April 11, 2022			RDL	April 11, 2022			RDL	October 18, 2022		
			Original	Duplicate	RPD		Original	Duplicate	RPD		Original	Duplicate	RPD
			BB-P1	BB-GWDUP			GH-P1	GH-GWDUP			BB-MW1	BB-GWDUP	
Conductivity (lab)	µS/cm	2	557	561	1	2	462	462	<1	2	1080	1100	<1
Total Dissolved Solids	mg/L	30	346	317	9	30	223	234	5	30	574	546	5
Chemical Oxygen Demand	mg/L	8	<8	<8	<2RDL	8	<8	9	<2RDL	8	23	23	<1
Dissolved Organic Carbon	mg/L	1.0	1.5	1.4	7	1.0	1	1	<1	1	8	8	<1
Alkalinity	mg/L	2	295	297	1	2	254	250	2	2	498	491	1
Chloride	mg/L	1	2	2	<2RDL	1	2	3	<2RDL	0.2	79	76	4
Sulphate	mg/L	2	5	5	<1	2	16	11	**37**	2	24	25	4
Calcium	mg/L	0.01	82.3	83.4	1	0.01	61.9	61.3	1	0.01	101	95.6	5
Magnesium	mg/L	0.001	22.4	22.3	<1	0.001	22.9	22.0	4	0.001	37.4	35.4	5
Sodium	mg/L	0.01	4.94	4.82	2	0.01	15.0	15.3	2	0.01	29.0	27.9	4
Potassium	mg/L	0.009	5.12	5.16	1	0.009	1.07	1.07	<1	0.009	9.69	9.25	5
Total Kjehldahl Nitrogen	mg/L	0.5	<0.5	<0.5	<2RDL	0.5	<0.5	<0.5	<2RDL	0.5	16.2	16.4	1
Ammonia	mg/L	0.1	<0.1	<0.1	<2RDL	0.1	0.3	0.2	<2RDL	0.1	15.2	15.3	1
Nitrate	mg/L	0.06	5.28	5.28	<1	0.06	<0.06	<0.06	<2RDL	0.06	<0.06	<0.06	<2RDL
Nitrite	mg/L	0.03	<0.03	<0.03	<2RDL	0.03	<0.03	<0.03	<2RDL	0.03	<0.03	<0.03	<2RDL
Total Phosphorus	mg/L	0.03	<0.03	<0.03	<2RDL	0.03	<0.03	<0.03	<2RDL	0.03	0.26	0.30	14
Phenols	mg/L	0.002	<0.002	<0.002	<2RDL	0.002	<0.002	<0.002	<2RDL	0.002	0.002	0.003	<2RDL
Arsenic	mg/L	0.0002	<0.0002	<0.0002	<2RDL	0.0002	0.0054	0.0058	7	0.0002	0.0003	0.0002	<2RDL
Barium	mg/L	0.00002	0.0304	0.0301	1	0.00002	0.131	0.136	4	0.00002	0.358	0.380	6
Boron	mg/L	0.002	0.045	0.046	2	0.002	0.052	0.062	18	0.002	0.103	0.108	5
Cadmium	mg/L	0.000003	0.000007	0.000006	<2RDL	0.000003	0.000003	0.000003	<1	0.000003	<0.000003	0.000003	<2RDL
Chromium	mg/L	0.00008	0.00096	0.00067	**36**	0.00008	0.00022	0.00014	<2RDL	0.00008	0.00044	0.00040	10
Copper	mg/L	0.0002	0.0048	0.0046	4	0.0002	0.0017	0.0006	**96**	0.0002	<0.0002	<0.0002	<2RDL
Iron	mg/L	0.007	<0.007	<0.007	<2RDL	0.007	1.43	1.38	4	0.007	3.28	3.12	5
Lead	mg/L	0.00009	0.00017	0.00017	<2RDL	0.00009	<0.00009	<0.00009	<2RDL	0.00009	<0.00009	<0.00009	<2RDL
Manganese	mg/L	0.00001	0.00024	0.00029	19	0.00001	0.0268	0.0269	<1	0.00001	0.064	0.060	5
Mercury	mg/L	0.00001	<0.00001	<0.00001	<2RDL	0.00001	<0.00001	<0.00001	<2RDL	0.00001	<0.00001	<0.00001	<2RDL
Zinc	mg/L	0.002	0.218	0.202	8	0.002	0.007	0.006	<2RDL	0.002	<0.002	<0.002	<2RDL

Notes:
- RDL - Reported Detection Limit
- RPD - Relative Percent Difference
- Bold indicates RPD >20% (or >2RDL)

Table 3: Surface Water Chemistry Results
Oxford County Closed Landfill Sites

Parameter	PWQO	Blandford-Blenheim Landfill					
		BB-SW1		BB-SW2		BB-SW3	
		22-Mar-22	18-Oct-22	22-Mar-22	18-Oct-22	22-Mar-22	18-Oct-22
pH (field - pH units)		7.32		7.34		7.91	
Conductivity (field - µS/cm)		174		278		501	
Temperature (field - °C)		5.02	DRY	2.96	DRY	5.24	DRY
Dissolved Oxygen (field)	4-7 (temp dependent)	7.58		12.94		11.94	
Flow Rate (L/s)		No Flow		No Flow		No Flow	
pH (lab - pH units)	6.5 - 8.5	7.83	-	7.91	-	7.66	-
Conductivity (lab - µS/cm)		182	-	310	-	437	-
Total Dissolved Solids		100	-	166	-	306	-
Chemical Oxygen Demand		<8	-	28	-	25	-
Biological Oxygen Demand		<4	-	4	-	<4	-
Total Suspended Solids		4	-	7	-	10	-
Alkalinity	<75% background	76	-	153	-	264	-
Chloride		11	-	6.5	-	13	-
Sulphate		2.0	-	2.2	-	5.0	-
TKN		<0.5	-	4.1	-	3.6	-
Ammonia		<0.1	-	3.8	-	3.2	-
Un-ionized Ammonia	0.02	<0.001	-	0.009	-	**0.033**	-
Nitrate		<0.03	-	<0.03	-	<0.03	-
Nitrite		<0.06	-	0.76	-	0.07	-
Total Phosphorus	0.03*	<0.03	-	<0.03	-	<0.03	-
Phenols	0.001	<0.002	-	**0.002**	-	<0.002	-
Arsenic	0.005*	0.0003	-	0.0003	-	0.0006	-
Barium		0.00911	-	0.0219	-	0.0445	-
Boron	0.200*	0.006	-	0.055	-	0.078	-
Cadmium	0.0001*	0.000008	-	0.000030	-	0.000009	-
Chromium	0.0089**	0.00026	-	0.00037	-	0.00024	-
Copper	0.005	0.0021	-	0.0029	-	0.0008	-
Iron	0.3	0.088	-	**1.26**	-	**1.41**	-
Lead	0.003*	0.00009	-	0.00125	-	0.00015	-
Mercury	0.0002	<0.00001	-	<0.00001	-	<0.00001	-
Zinc	0.02*	0.004	-	0.005	-	0.005	-
Benzene (µg/L)	100*	<0.5	-	<0.5	-	<0.5	-
1,4 - Dichlorobenzene (µg/L)	4	<0.5	-	<0.5	-	<0.5	-
Dichloromethane (µg/L)	100*	<0.5	-	<0.5	-	<0.5	-
Toluene (µg/L)	0.8*	<0.5	-	<0.5	-	<0.5	-
Vinyl Chloride (µg/L)	600*	<0.2	-	<0.2	-	<0.2	-

Notes:
- All concentrations are mg/L, unless otherwise noted.
- Un-ionized ammonia concentration calculated based on the fraction of NH_3 (f) in the total ammonia.
  - *where:* f = 1/(10^{pKa-pH})+1)
  - pKa=0.09018 + 2729.92/T
  - T = ambient water temperature in Kelvin (K = C + 273.16)
- Bold values exceed the PWQO.
- PWQO - Provincial Water Quality Objectives (July 1994 with updates)
- * indicates an interim PWQO.
- ** indicates PWQO for Chromium III
- <value - parameter not detected above associated laboratory reported detection limit
- dry - sampling location dry at the time of sampling
- - or blank - parameter not analysed during sampling event

Table 3: Surface Water Chemistry Results
Oxford County Closed Landfill Sites

Parameter	PWQO	Gunn's Hill Landfill		
		GH-SEEP	GH-SW1	GH-SW2
pH (field - pH units)		No seeps were observed on February 15, March 22, March 30, July 13, October 17, or December 12, 2022.	-	-
Conductivity (field - µS/cm)			-	-
Temperature (field - °C)			-	-
Dissolved Oxygen (field)	4-7 (temp dependent)		-	-
Flow Rate (L/s)			-	-
pH (lab - pH units)	6.5 - 8.5	-	-	-
Conductivity (lab - µS/cm)		-	-	-
Total Dissolved Solids		-	-	-
Chemical Oxygen Demand		-	-	-
Biological Oxygen Demand		-	-	-
Total Suspended Solids		-	-	-
Alkalinity	<75% background	-	-	-
Chloride		-	-	-
Sulphate		-	-	-
TKN		-	-	-
Ammonia		-	-	-
Un-ionized Ammonia	0.02	-	-	-
Nitrate		-	-	-
Nitrite		-	-	-
Total Phosphorus	0.03*	-	-	-
Phenols	0.001	-	-	-
Arsenic	0.005*	-	-	-
Barium		-	-	-
Boron	0.200*	-	-	-
Cadmium	0.0001*	-	-	-
Chromium	0.0089**	-	-	-
Copper	0.005	-	-	-
Iron	0.3	-	-	-
Lead	0.003*	-	-	-
Mercury	0.0002	-	-	-
Zinc	0.02*	-	-	-
Benzene (µg/L)	100*	-	-	-
1,4 - Dichlorobenzene (µg/L)	4	-	-	-
Dichloromethane (µg/L)	100*	-	-	-
Toluene (µg/L)	0.8*	-	-	-
Vinyl Chloride (µg/L)	600*	-	-	-

Notes:
- All concentrations are mg/L, unless otherwise noted.
- Un-ionized ammonia concentration calculated based on the fraction of NH_3 (f) in the total ammonia.
  where: f = 1/(10^{pKa-pH})+1)
  pKa=0.09018 + 2729.92/T
  T = ambient water temperature in Kelvin (K = C + 273.16)
- Bold values exceed the PWQO.
- PWQO - Provincial Water Quality Objectives (July 1994 with updates)
- * indicates an interim PWQO.
- ** indicates PWQO for Chromium III
- <value - parameter not detected above associated laboratory reported detection limit
- dry - sampling location dry at the time of sampling
- - or blank - parameter not analysed during sampling event

Table 4: Summary of Surface Water Duplicate Sample Results
Oxford County Closed Landfill Sites

Parameter	Unit	RDL	March 22, 2022		
			Original BB-SW2	Duplicate SW DUP	RPD
Conductivity (lab)	µS/cm	2	310	321	3
Total Dissolved Solids	mg/L	30	166	169	2
Chemical Oxygen Demand	mg/L	8	28	27	4
Biological Oxygen Demand	mg/L	2	4	<4	<2RDL
Total Suspended Solids	mg/L	2	7	7	<2RDL
Alkalinity	mg/L	2	153	158	3
Chloride	mg/L	0.2	6.5	6.5	<1
Sulphate	mg/L	0.2	2.2	2.2	<1
TKN	mg/L	0.5	4.1	4.1	<1
Ammonia	mg/L	0.1	3.8	3.8	<1
Un-ionized Ammonia	mg/L	0.001	0.009	0.009	<1
Nitrate	mg/L	0.06	<0.03	<0.03	<2RDL
Nitrite	mg/L	0.03	0.76	0.76	<1
Total Phosphorus	mg/L	0.03	<0.03	<0.03	<2RDL
Phenols	mg/L	0.002	0.002	<0.002	<2RDL
Arsenic	mg/L	0.0002	0.0003	0.0007	<2RDL
Barium	mg/L	0.0002	0.0219	0.0228	4
Boron	mg/L	0.002	0.055	0.060	9
Cadmium	mg/L	0.000003	0.000030	0.000042	**33**
Chromium	mg/L	0.00008	0.00037	0.00048	**26**
Copper	mg/L	0.0002	0.0029	0.0024	<1
Iron	mg/L	0.007	1.26	1.31	4
Lead	mg/L	0.00009	0.00125	0.00125	0
Mercury	mg/L	0.00001	<0.00001	<0.00001	<2RDL
Zinc	mg/L	0.002	0.005	0.006	<2RDL

Notes:
- RDL - Reported Detection Limit
- RPD - Relative Percent Difference
- Bold indicates RPD >20% (or >2RDL)

Table 5
Landfill Gas Measurements and Water Level Elevations
Oxford County Closed Landfills

Well ID	Date	% LEL	% O2	Relative Pressure (in H20)	Measuring Point (masl)	Water Level (mbMP)	Groundwater Elevation (masl)	Top of Screen Elevation (masl)	Well Screen Submerged
Blandford-Blenheim Landfill									
BB-GP1	15-Feb-22	0	20.9	0.00	304.95	4.24	300.71	302.68	No
	13-Jul-22	0	20.9	0.00	304.95	4.18	300.77	302.68	No
	18-Oct-22	0	20.9	0.00	304.95	4.84	300.11	302.68	No
	12-Dec-22	0	20.9	0.00	304.95	5.08	299.87	302.68	No
BB-MW1	15-Feb-22	0	20.9	0.00	300.08	2.41	297.67	293.55	Yes
	11-Apr-22	-	-	-	300.08	2.36	297.72	293.55	Yes
	13-Jul-22	0	20.9	0.00	300.08	2.47	297.61	293.55	Yes
	18-Oct-22	0	20.9	0.00	300.08	2.93	297.15	293.55	Yes
	12-Dec-22	0	20.9	0.00	300.08	2.71	297.37	293.55	Yes
BB-MW2	15-Feb-22	0	20.9	0.00	303.88	4.40	299.48	296.52	Yes
	11-Apr-22	-	-	-	303.88	3.99	299.89	296.52	Yes
	13-Jul-22	0	20.9	0.00	303.88	4.43	299.45	296.52	Yes
	18-Oct-22	0	20.9	0.00	303.88	4.94	298.94	296.52	Yes
	12-Dec-22	0	20.9	0.00	303.88	5.03	298.85	296.52	Yes
BB-MW3	15-Feb-22	0	20.9	0.00	305.22	4.52	300.70	298.02	Yes
	11-Apr-22	-	-	-	305.22	4.07	301.15	298.02	Yes
	13-Jul-22	0	20.9	0.00	305.22	4.56	300.66	298.02	Yes
	18-Oct-22	0	20.9	0.00	305.22	5.20	300.02	298.02	Yes
	12-Dec-22	0	20.9	0.00	305.22	5.42	299.80	298.02	Yes
BB-BH1-1	15-Feb-22	0	20.9	0.00	303.52	4.75	298.77	N/A	N/A
	11-Apr-22	-	-	-	303.52	5.94	297.58	N/A	N/A
	13-Jul-22	0	20.9	0.00	303.52	4.47	299.05	N/A	N/A
	18-Oct-22	0	20.9	0.00	303.52	6.58	296.94	N/A	N/A
	12-Dec-22	0	20.9	0.00	303.52	4.90	298.62	N/A	N/A
BB-BH1-2	15-Feb-22	0	20.9	0.00	303.50	4.36	299.14	N/A	N/A
	11-Apr-22	-	-	-	303.50	4.10	299.40	N/A	N/A
	13-Jul-22	0	20.9	0.00	303.50	4.16	299.34	N/A	N/A
	18-Oct-22	0	20.9	0.00	303.50	4.51	298.99	N/A	N/A
	12-Dec-22	0	20.9	0.00	303.50	4.41	299.09	N/A	N/A
Gunn's Hill Landfill									
GH-GP1	15-Feb-22	0	20.9	0.00	320.51	2.08	318.43	318.67	No
	13-Jul-22	0	20.9	0.00	320.51	2.55	317.96	318.67	No
	17-Oct-22	0	20.6	0.00	320.51	2.57	317.94	318.67	No
	12-Dec-22	0	20.9	0.00	320.51	2.62	317.89	318.67	No
GH-GP2	15-Feb-22	0	20.9	0.00	313.54	DRY	<309.52	311.66	No
	13-Jul-22	0	20.9	0.00	313.54	DRY	<309.52	311.66	No
	17-Oct-22	0	19.7	0.00	313.54	DRY	<309.52	311.66	No
	12-Dec-22	0	20.9	0.00	313.54	DRY	<309.52	311.66	No

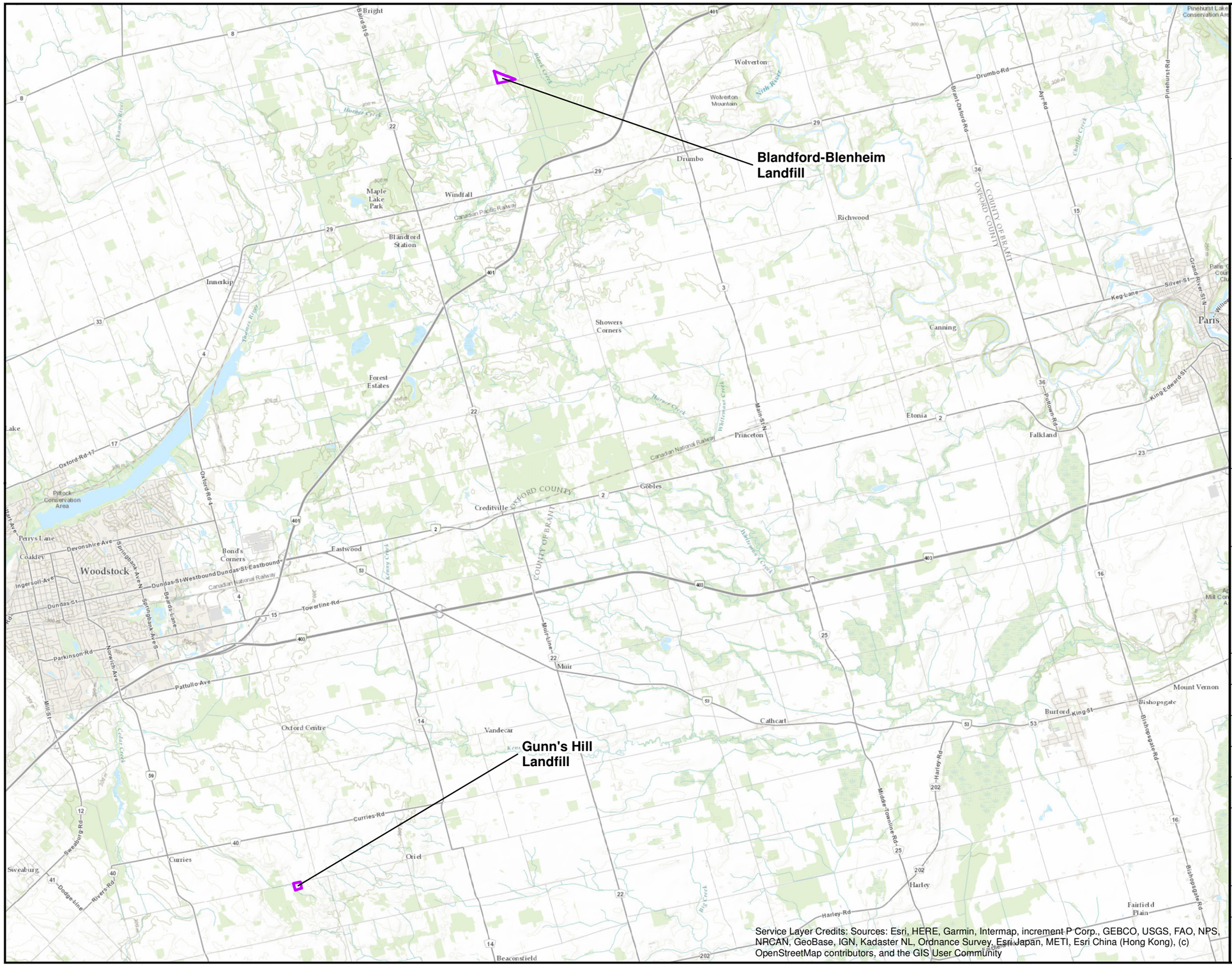
Notes:
LEL - Lower Explosive Limit for methane in air
in H20 - inches of water
masl - metres above sea level
mbMP - metres below measuring point (top of pipe)
NA - not applicable

Table 6: Guideline B-7 Compliance
Oxford County Closed Landfill Sites

Parameter	Reference Quality	ODWQS	Guideline B-7	BB-MW1		BB-MW2	
				11-Apr-22	18-Oct-22	11-Apr-22	18-Oct-22
Total Dissolved Solids	220	500 AO	360	**617**	**574**	**420**	**394**
Dissolved Organic Carbon	0.9	5 AO	3.0	**9.3**	**8**	1.1	3
Alkalinity	208	30 - 500 OG	354	**597**	**498**	248	231
Chloride	2	250 AO	126	48	79	27	37
Sulphate	5	500 AO	253	22	24	73	82
Sodium	8.85	200 AO	104	35.4	29.0	5.02	3.85
Nitrate	0.19	10.0 MAC	2.64	<0.06	<0.06	0.70	0.45
Nitrite	0.015	1.0 MAC	0.26	<0.03	<0.03	0.14	0.11
Arsenic	0.0006	0.01 MAC	0.0030	0.0005	0.0003	0.0011	0.0007
Barium	0.009	1.0 MAC	0.257	**0.519**	**0.358**	0.0633	0.0613
Boron	0.0115	5.0 IMAC	1.26	0.176	0.103	0.013	0.007
Cadmium	0.000007	0.005 MAC	0.0013	<0.000003	<0.000003	0.000005	<0.000003
Chromium	0.0005	0.05 MAC	0.013	0.00064	0.00044	0.00014	0.00013
Copper	0.00085	1 AO	0.50	0.0003	<0.0002	0.0008	<0.0002
Iron	0.0035	0.3 AO	0.15	**3.84**	**3.28**	**0.198**	0.095
Lead	0.00005	0.010 MAC	0.0025	<0.00009	<0.00009	0.00019	<0.00009
Manganese	0.0026	0.05 AO	0.026	**0.0972**	**0.0636**	**0.0318**	0.0190
Mercury	0.000005	0.001 MAC	0.00025	<0.00001	<0.00001	<0.00001	<0.00001
Zinc	0.001	5.0 AO	2.50	0.002	<0.002	0.004	<0.002
Benzene (µg/L)	0.25	1 MAC	0.44	<0.5	<0.5	<0.5	<0.5
1,4 - Dichlorobenzene (µg/L)	0.25	5 MAC	1.44	<0.5	<0.5	<0.5	<0.5
	0.25	1 AO	0.63				
Dichloromethane (µg/L)	0.25	50 MAC	12.7	<0.5	<0.5	<0.5	<0.5
Toluene (µg/L)	0.25	60 MAC	15.2	<0.5	<0.5	<0.5	<0.5
	0.25	24 AO	12.1				
Vinyl Chloride (µg/L)	0.1	1 MAC	0.33	<0.2	<0.2	<0.2	<0.2

Notes:
- All units in mg/L unless otherwise noted
- ODWQS - Ontario Drinking Water Quality Standard (June 2003)
- Bold values indicate exceedance of GB-7 value
- All units in mg/L unless otherwise noted
- µg/L - micrograms per litre
- MAC - Maximum Acceptable Concentration
- IMAC - Interim Maximum Acceptable Concentration
- AO - Aesthetic Objective
- OG - Operational Guideline
- <value - parameter not detected above associated laboratory reported detection limit
- Reference Quality based on 2022 groundwater quality measured from background observation well BB-MW3.

FIGURES



Document Path: C:\aProjects\191-06761-02\191-06761-02 Figure 1 Site Location Map.mxd

55 KING STREET, SUITE 700
ST. CATHARINES, ONTARIO CANADA L2R 3H5
TEL.: 905-687-1771 | FAX: 905-687-1773 | WWW.WSP.COM

LEGEND

CLOSED LANDFILL LOCATION

N
W E
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2 1 0 2 Kilometres

CLIENT:

OXFORD COUNTY

PROJECT:

OXFORD COUNTY CLOSED LANDFILLS

PROJECT NO:	DATE:
191-06761-02	JANUARY 2023

DESIGNED BY: -

DRAWN BY: T.P.

CHECKED BY: JM

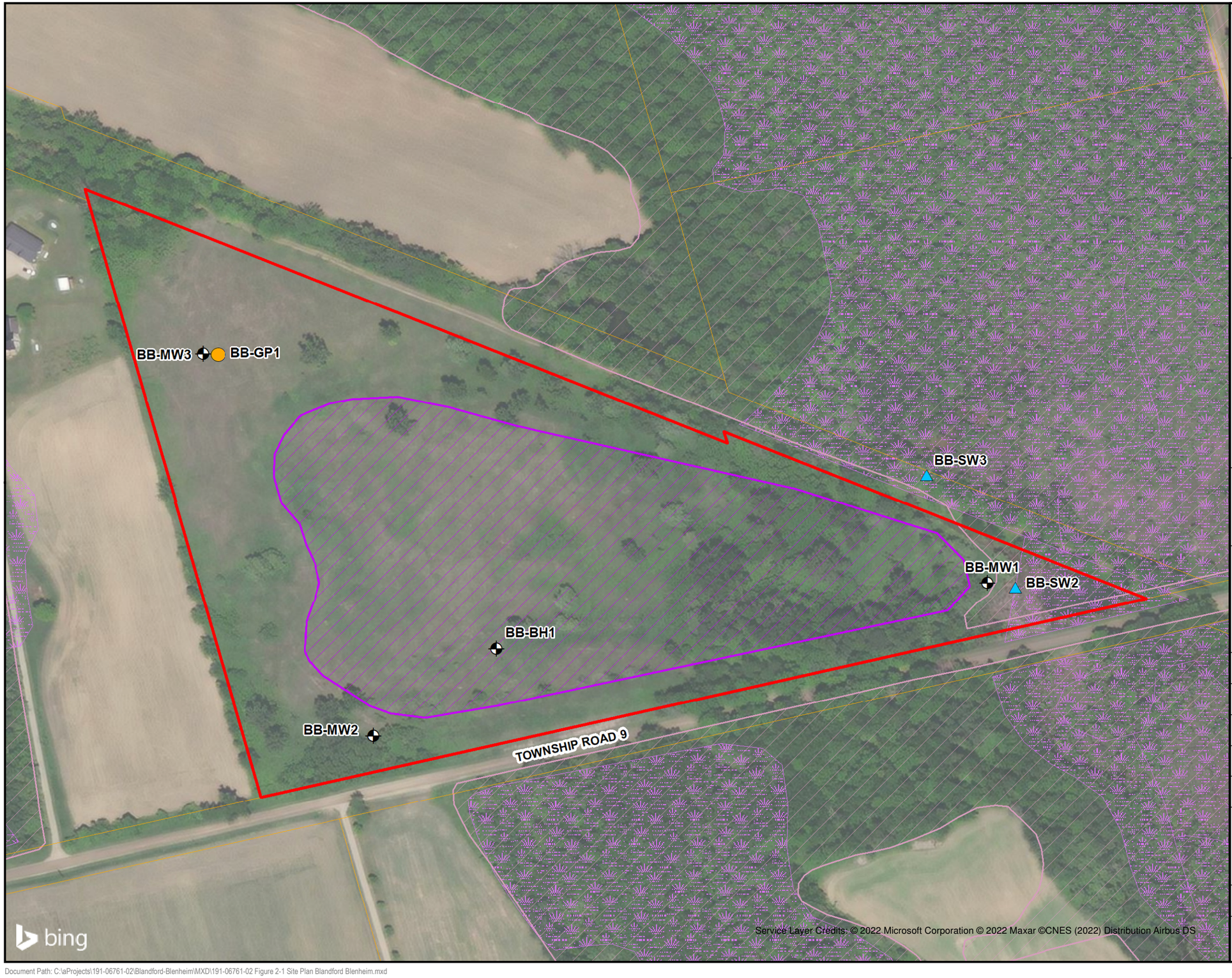
FIGURE NO:	SCALE:
1	1:100,000

TITLE:

SITE LOCATION PLAN

DISCIPLINE: ENVIRONMENT

ISSUE:	REV.:
-	-



wsp

55 KING STREET, SUITE 700
ST. CATHARINES, ONTARIO CANADA L2R 3H5
TEL.: 905-687-1771 | FAX: 905-687-1773 | WWW.WSP.COM

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- PROPERTY BOUNDARIES
- PROVINCIALLY SIGNIFICANT WETLAND
- ANSI
- ESTIMATED EXTENT OF REFUSE
- MONITORING WELL LOCATION
- GAS PROBE LOCATION
- SURFACE WATER SAMPLING LOCATION

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20 10 0 20 Metres

CLIENT:
OXFORD COUNTY

PROJECT:
OXFORD COUNTY CLOSED LANDFILLS

PROJECT NO:	DATE:
191-06761-02	JANUARY 2023

DESIGNED BY: -

DRAWN BY: T.P.

CHECKED BY: JM

FIGURE NO:	SCALE:
2-1	1:2,000

TITLE:
BLANDFORD-BLENHEIM
CLOSED LANDFILL SITE PLAN

DISCIPLINE:
ENVIRONMENT

ISSUE:	REV.:
-	-

Document Path: C:\aProjects\191-06761-02\Blandford-Blenheim\MXD\191-06761-02 Figure 2-1 Site Plan Blandford Blenheim.mxd

55 KING STREET, SUITE 700
ST. CATHARINES, ONTARIO CANADA L2R 3H5
TEL.: 905-687-1771 | FAX: 905-687-1773 | WWW.WSP.COM

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- PROPERTY BOUNDARIES
- WATERCOURSE
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERBODIES
- ANSI
- PRIVATE DRINKING WATER WELL
- SURFACE WATER SAMPLING LOCATION

N
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70 35 0 70 Metres

CLIENT:
OXFORD COUNTY

PROJECT:
OXFORD COUNTY CLOSED LANDFILLS

PROJECT NO:	DATE:
191-06761-02	JANUARY 2023

DESIGNED BY:
-

DRAWN BY:
T.P.

CHECKED BY:
JM

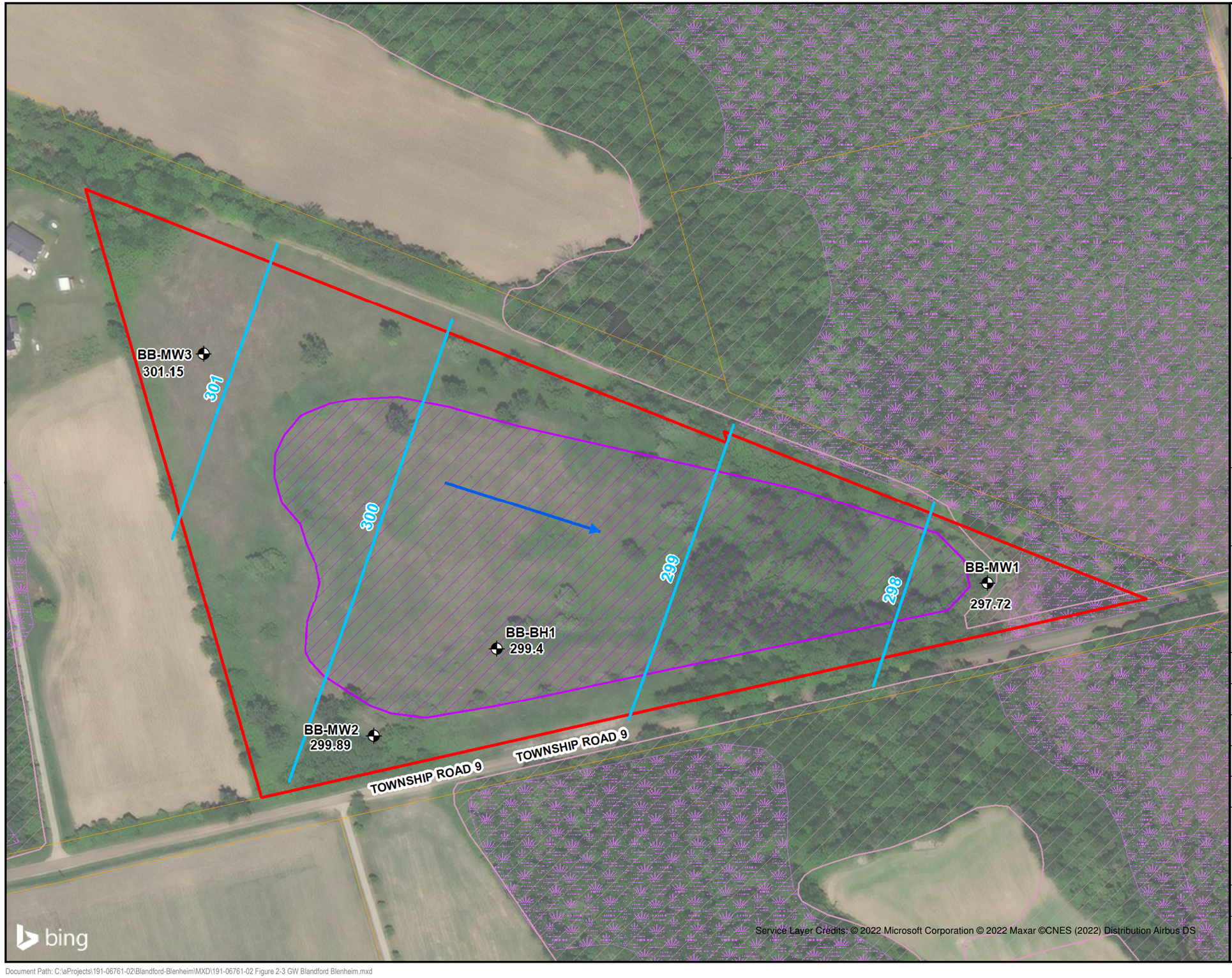
FIGURE NO:	SCALE:
2-2	1:6,000

TITLE:
BLANDFORD-BLENHEIM
CLOSED LANDFILL PRIVATE WELL AND
SURFACE WATER SAMPLING LOCATIONS

DISCIPLINE:
ENVIRONMENT

ISSUE:	REV.:
-	-

Document Path: C:\aProjects\191-06761-02\Blandford-Blenheim\MXD\191-06761-02 Figure 2-2 Study Area Blandford Blenheim.mxd



55 KING STREET, SUITE 700
ST. CATHARINES, ONTARIO CANADA L2R 3H5
TEL.: 905-687-1771 | FAX: 905-687-1773 | WWW.WSP.COM

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- PROPERTY BOUNDARIES
- PROVINCIALLY SIGNIFICANT WETLAND
- ANSI
- ESTIMATED EXTENT OF REFUSE
- MONITORING WELL LOCATION
- 301.15 GROUNDWATER ELEVATION FOR APRIL 2022 (mASL)
- INFERRED GROUNDWATER CONTOUR (mASL)
- INFERRED GROUNDWATER FLOW DIRECTION

N W E S

20 10 0 20 Metres

CLIENT:
OXFORD COUNTY

PROJECT:
OXFORD COUNTY CLOSED LANDFILLS

PROJECT NO:	DATE:
191-06761-02	JANUARY 2023

DESIGNED BY: -

DRAWN BY: T.P.

CHECKED BY: JM

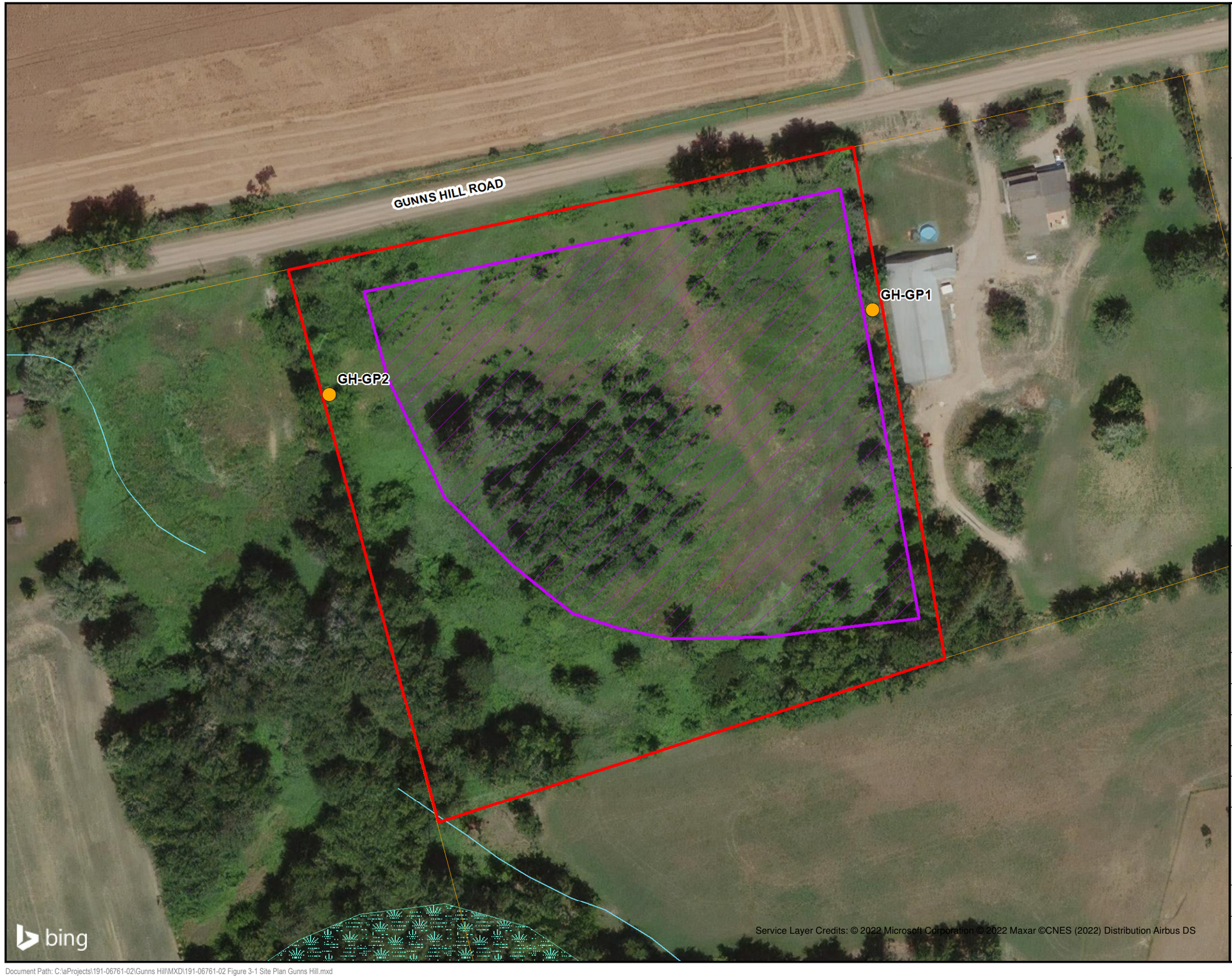
FIGURE NO:	SCALE:
2-3	1:2,000

TITLE:
BLANDFORD-BLENHEIM
CLOSED LANDFILL
GROUNDWATER ELEVATIONS - APRIL 2022

DISCIPLINE:
ENVIRONMENT

ISSUE:	REV.:
-	-

Document Path: C:\aProjects\191-06761-02\Blandford-Blenheim\MXD\191-06761-02 Figure 2-3 GW Blandford Blenheim.mxd



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ST. CATHARINES, ONTARIO CANADA L2R 3H5
TEL.: 905-687-1771 | FAX: 905-687-1773 | WWW.WSP.COM

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- PROPERTY BOUNDARIES
- WATERCOURSE
- EVALUATED WETLAND
- ESTIMATED EXTENT OF REFUSE
- GAS PROBE LOCATION

N
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12 6 0 12 Metres

CLIENT:
OXFORD COUNTY

PROJECT:
OXFORD COUNTY CLOSED LANDFILLS

PROJECT NO:	DATE:
191-06761-02	JANUARY 2023

DESIGNED BY: -

DRAWN BY: T.P.

CHECKED BY: JM

FIGURE NO:	SCALE:
3-1	1:1,250

TITLE:
GUNN'S HILL
CLOSED LANDFILL
SITE PLAN

DISCIPLINE:
ENVIRONMENT

ISSUE:	REV.:
-	-

Document Path: C:\aProjects\191-06761-02\Gunns Hill\MXD\191-06761-02 Figure 3-1 Site Plan Gunns Hill.mxd

55 KING STREET, SUITE 700
ST. CATHARINES, ONTARIO CANADA L2R 3H5
TEL.: 905-687-1771 | FAX: 905-687-1773 | WWW.WSP.COM

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- PROPERTY BOUNDARIES
- WATERCOURSE
- EVALUATED WETLAND
- PRIVATE DRINKING WATER WELL

N
W E
S

70 35 0 70 Metres

CLIENT:

OXFORD COUNTY

PROJECT:

OXFORD COUNTY CLOSED LANDFILLS

PROJECT NO:	DATE:
191-06761-02	JANUARY 2023

DESIGNED BY: -

DRAWN BY: T.P.

CHECKED BY: JM

FIGURE NO:	SCALE:
3-2	1:5,000

TITLE:

GUNN'S HILL
CLOSED LANDFILL
PRIVATE WELL SAMPLING LOCATIONS

DISCIPLINE:

ENVIRONMENT

ISSUE:	REV.:
-	-

Document Path: C:\aProjects\191-06761-02\Gunns Hill\MXD\191-06761-02 Figure 3-2 Study Area Gunns Hill.mxd

APPENDIX

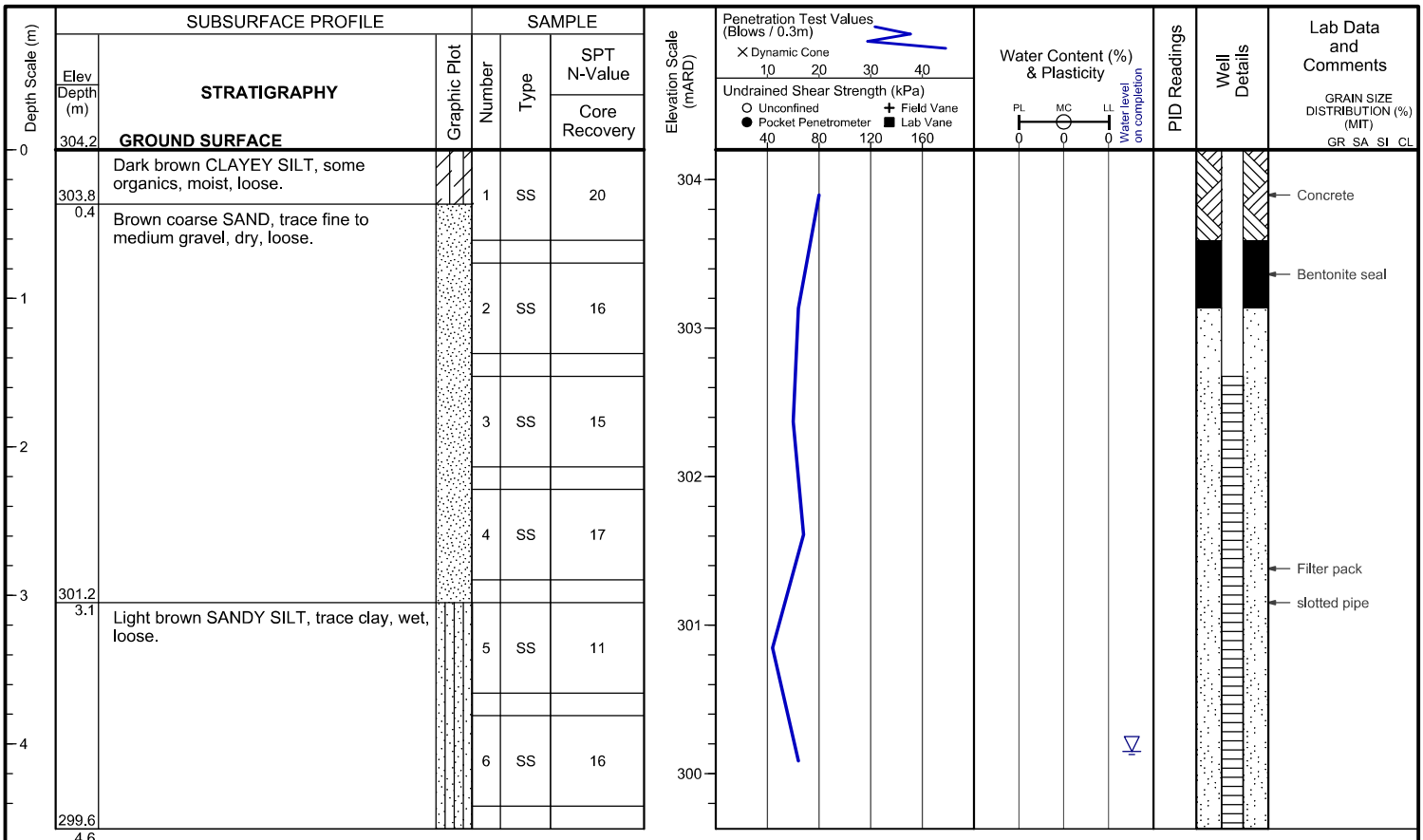
A BOREHOLE LOGS

APPENDIX

A-1 *BLANDFORD-BLENHEIM LANDFILL*

LOG OF BOREHOLE BB-GP1

project |	Oxford County Closed Landfills			**project no. |**	191-06761-02
client |	County of Oxford	**rig type |**	CME 75, track-mounted	**date started |**	2022-01-18
location |	Blandford-Blenheim Landfill, Ontario	**method |**	Hollow stem augers, 215 mm dia.	**supervisor |**	MEQ
position |		**coring |**	*n/a*	**reviewer |**	AMS

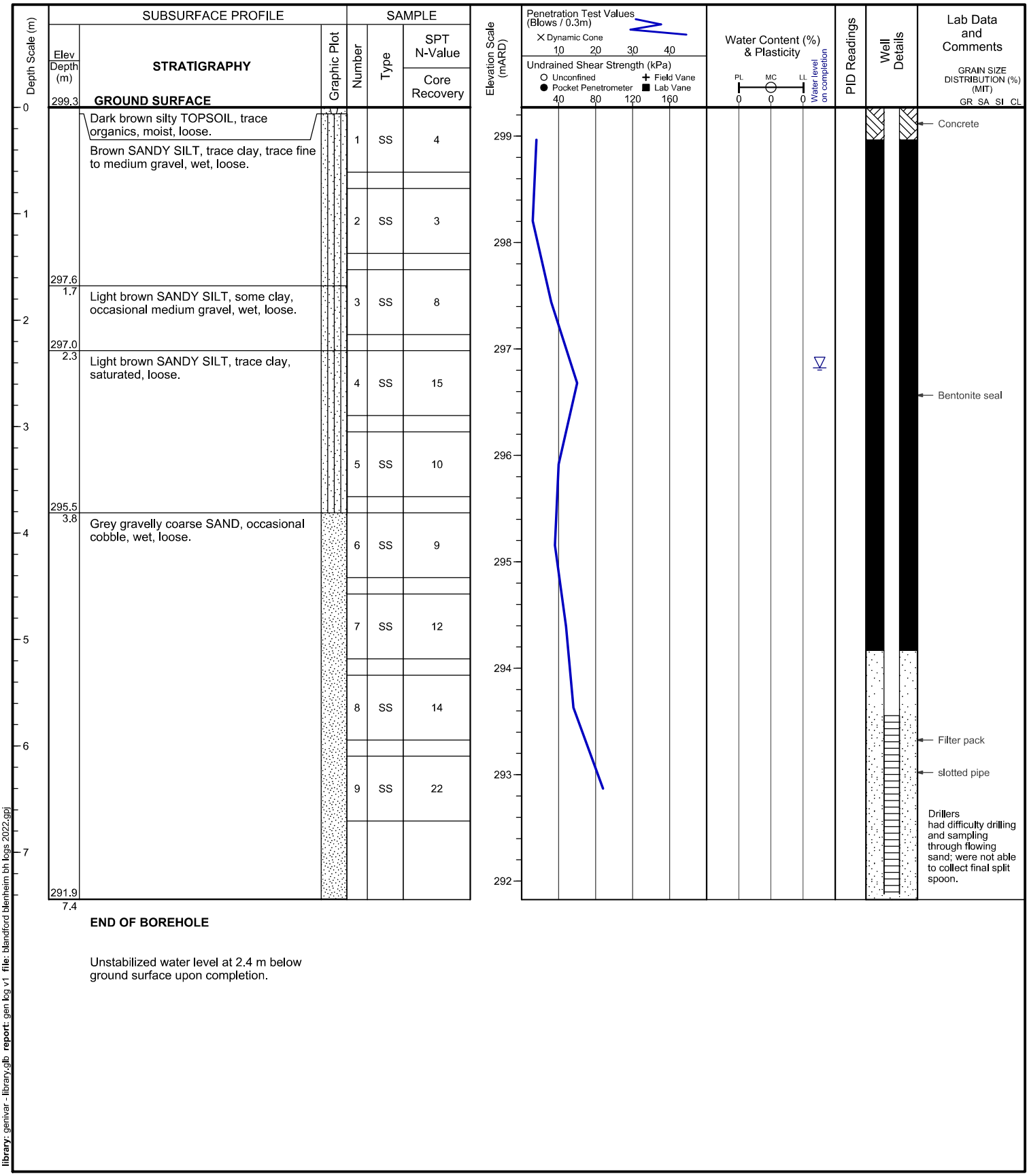


END OF BOREHOLE

Unstabilized water level at 4.1 m below ground surface upon completion.

LOG OF BOREHOLE BB-MW1

project |	Oxford County Closed Landfills			**project no. |**	191-06761-02
client |	County of Oxford	**rig type |**	CME 75, track-mounted	**date started |**	2022-01-19
location |	Blandford-Blenheim Landfill, Ontario	**method |**	Hollow stem augers, 215 mm dia.	**supervisor |**	MEQ
position |		**coring |**	*n/a*	**reviewer |**	AMS



Unstabilized water level at 2.4 m below ground surface upon completion.

LOG OF BOREHOLE BB-MW2

project | Oxford County Closed Landfills
project no. | 191-06761-02
client | County of Oxford
rig type | CME 75, track-mounted
date started | 2022-01-19
location | Blandford-Blenheim Landfill, Ontario
method | Hollow stem augers, 215 mm dia.
supervisor | MEQ
position |
coring | *n/a*
reviewer | AMS

Depth Scale (m)	Elev / Depth (m)	STRATIGRAPHY	Graphic Plot	Sample Number	Sample Type	SPT N-Value / Core Recovery
0	303.0	**GROUND SURFACE**				
	302.9 / 0.1	Dark brown clayey silt TOPSOIL, some organics, moist, loose.		1	SS	3
		Grey-brown fine to medium SAND, some refuse, moist, loose.		2	SS	7
1	301.3 / 1.7	Light brown fine to medium SAND, trace coarse gravel, trace clayey silt, occasional cobble, moist, loose.		3	SS	24
				4	SS	1
2	300.0 / 3.1	Red-brown SAND, some clayey silt, trace coarse gravel, moist, loose.		5	SS	3
3	299.2 / 3.8	Grey gravelly coarse SAND, wet, loose.				
	299.0 / 4.0	Light brown SANDY SILT, trace clay, wet, loose.		6	SS	10
4				7	SS	9
				8	SS	11
5	297.0 / 6.0	Grey CLAYEY SILT TILL, trace of fine to medium gravel, trace sand, occasional cobble, wet, stiff.		9	SS	10
6	296.1 / 7.0	Grey gravelly coarse SAND, wet, loose.		10	SS	9
	295.4 / 7.6	Grey SANDY SILT AND GRAVEL, trace clay, occasional cobble, wet, loose.		11	SS	26
7	294.8 / 8.2	**END OF BOREHOLE**				
8		Unstabilized water level at 4.2 m below ground surface upon completion.				

Elevation Scale (mASD): 302, 301, 300, 299, 298, 297, 296, 295

Penetration Test Values (Blows / 0.3m)
× Dynamic Cone
10 20 30 40

Undrained Shear Strength (kPa)
○ Unconfined + Field Vane
● Pocket Penetrometer ■ Lab Vane
40 80 120 160

Water Content (%) & Plasticity
PL MC LL
0 0 0
Water level on completion

PID Readings

Well Details
- Concrete
- Bentonite seal
- Filter pack
- slotted pipe

Lab Data and Comments
GRAIN SIZE DISTRIBUTION (%) (MIT)
GR SA SI CL

LOG OF BOREHOLE BB-MW3

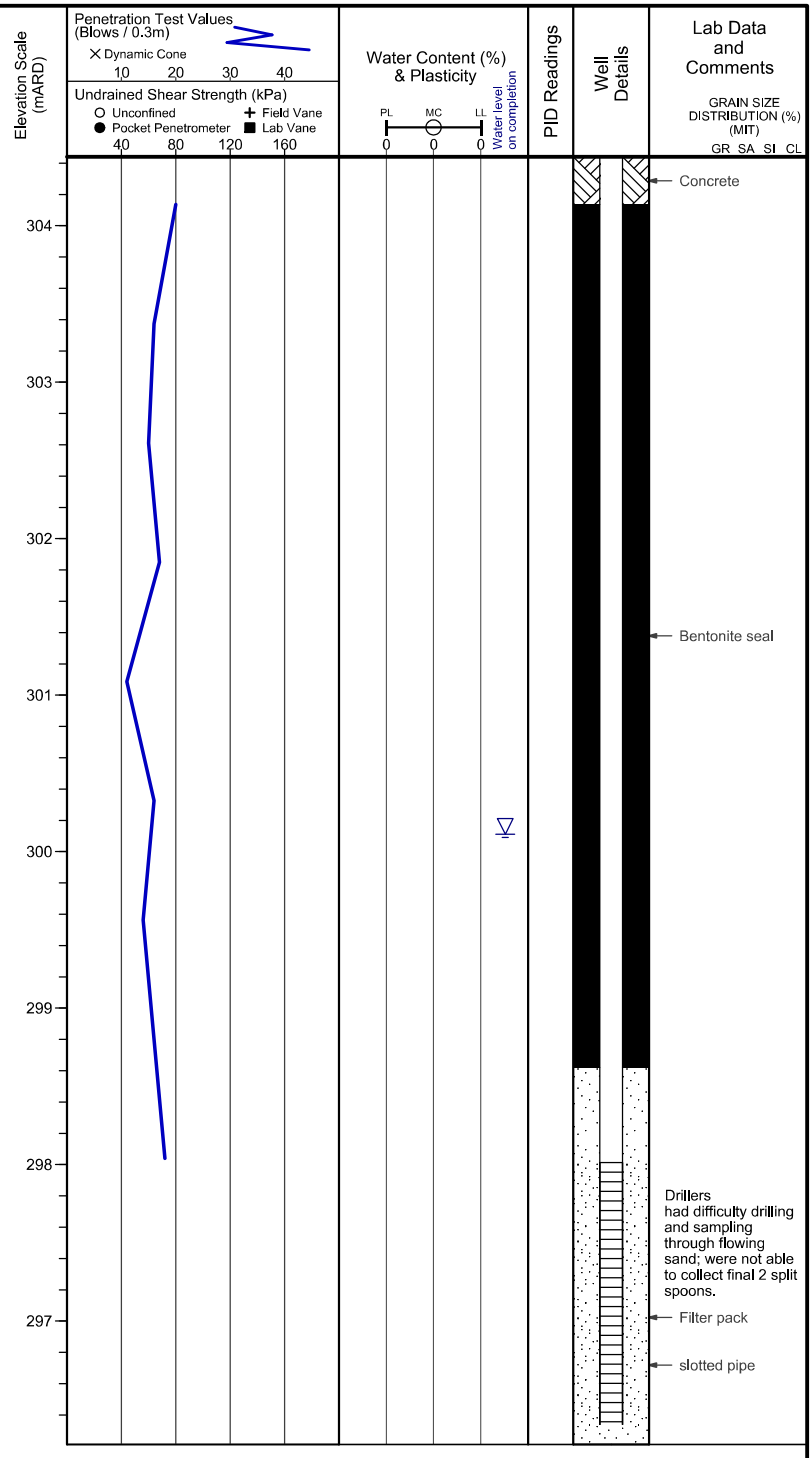
project | Oxford County Closed Landfills
client | County of Oxford
location | Blandford-Blenheim Landfill, Ontario
position |

rig type | CME 75, track-mounted
method | Hollow stem augers, 215 mm dia.
coring | *n/a*

project no. | 191-06761-02
date started | 2022-01-18
supervisor | MEQ
reviewer | AMS

Depth Scale (m)	Elev / Depth (m)	STRATIGRAPHY	Graphic Plot	SAMPLE Number	Type	SPT N-Value / Core Recovery
0	304.4	**GROUND SURFACE**				
	304.0 / 0.4	Dark brown CLAYEY SILT, some organics, moist, loose.		1	SS	20
1		Brown coarse SAND, trace fine to medium gravel, dry, loose.		2	SS	16
2				3	SS	15
				4	SS	17
3	301.4 / 3.1	Light brown SANDY SILT, trace clay, wet, loose.		5	SS	11
4				6	SS	16
5	299.2 / 5.2	Grey gravelly coarse SAND, occasional cobble, wet, loose.		7	SS	14
				8	SS	16
6				9	SS	18
7						
8	296.2 / 8.2	**END OF BOREHOLE**				

Unstabilized water level at 4.3 m below ground surface upon completion.



Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

4706488

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

MUNICIP 47002 | CON. CON | 109

COUNTY OR DISTRICT [redacted] | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE BLANDFORD-BLENHEIM | CON. BLOCK, TRACT, SURVEY, ETC 9 | LOT 19

RR # 3 BRIGHT

DATE COMPLETED DAY 15 MO 03 YR 89

[redacted] 89064 | RC. | ELEVATION 1000 | RC. | BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
				0	1
TOP SOIL					
BROWN	SAND	WITH	STONES	1	3
BROWN	SAND		COARSE DRY	3	4
BROWN	SAND			4	20
BROWN	SAND		FINE	20	40

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
20-40	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
36	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☒ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	3"	0'	40'
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE: GRAVEL

DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33	

71 PUMPING TEST

PUMPING TEST METHOD 1 ☐ PUMP 2 ☐ BAILER

PUMPING RATE GPM

DURATION OF PUMPING HOURS MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING (1 ☐ PUMPING 2 ☐ RECOVERY) 15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
20 FEET	FEET	FEET	FEET	FEET	FEET

IF FLOWING, GIVE RATE GPM

PUMP INTAKE SET AT FEET

WATER AT END OF TEST 1 ☐ CLEAR 2 ☐ CLOUDY

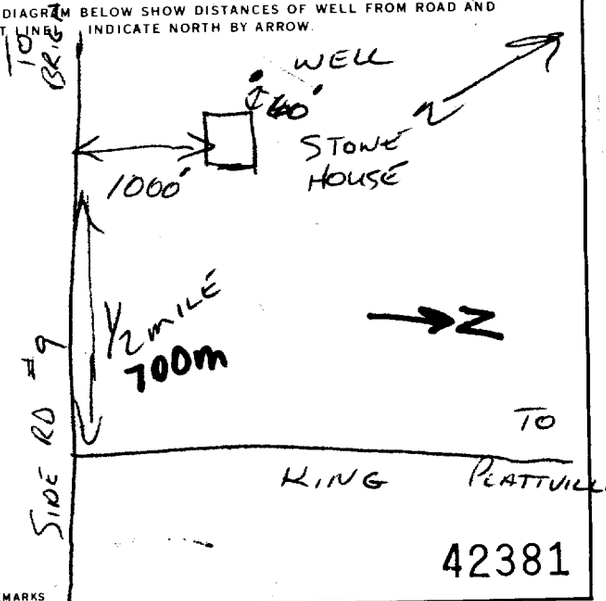
RECOMMENDED PUMP TYPE ☐ SHALLOW ☑ DEEP

RECOMMENDED PUMP SETTING 38 FEET

RECOMMENDED PUMPING RATE 1 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS: 42381

FINAL STATUS OF WELL

1 ☑ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED ☐ DEWATERING

WATER USE

1 ☑ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☑ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: ~~D~~ JOHNSON & BAETZ | WELL CONTRACTOR'S LICENCE NUMBER: 3030

ADDRESS: RR # 1 MT. PLEASANT

NAME OF WELL TECHNICIAN: DON BAETZ | WELL TECHNICIAN'S LICENCE NUMBER: T0338

SIGNATURE OF TECHNICIAN/CONTRACTOR: [signature] | SUBMISSION DATE DAY ____ MO ____ YR ____

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR 3030 | DATE RECEIVED APR 20 1989

DATE OF INSPECTION | INSPECTOR

REMARKS: CSS.S8

MINISTRY OF THE ENVIRONMENT COPY

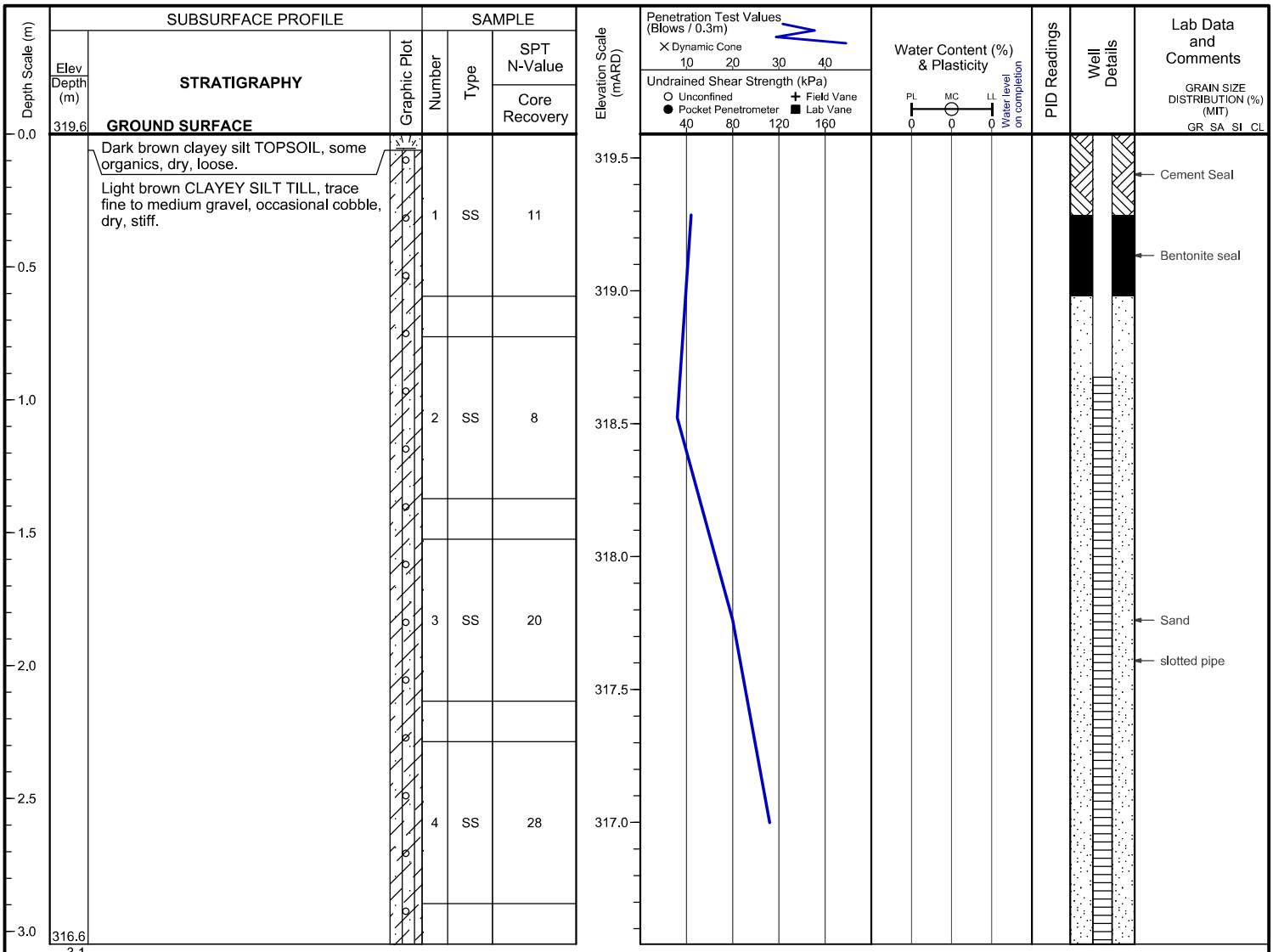
FORM NO. 0506 (11/86) FORM 9

APPENDIX

A-2 *GUNN'S HILL LANDFILL*

LOG OF BOREHOLE GH-GP1

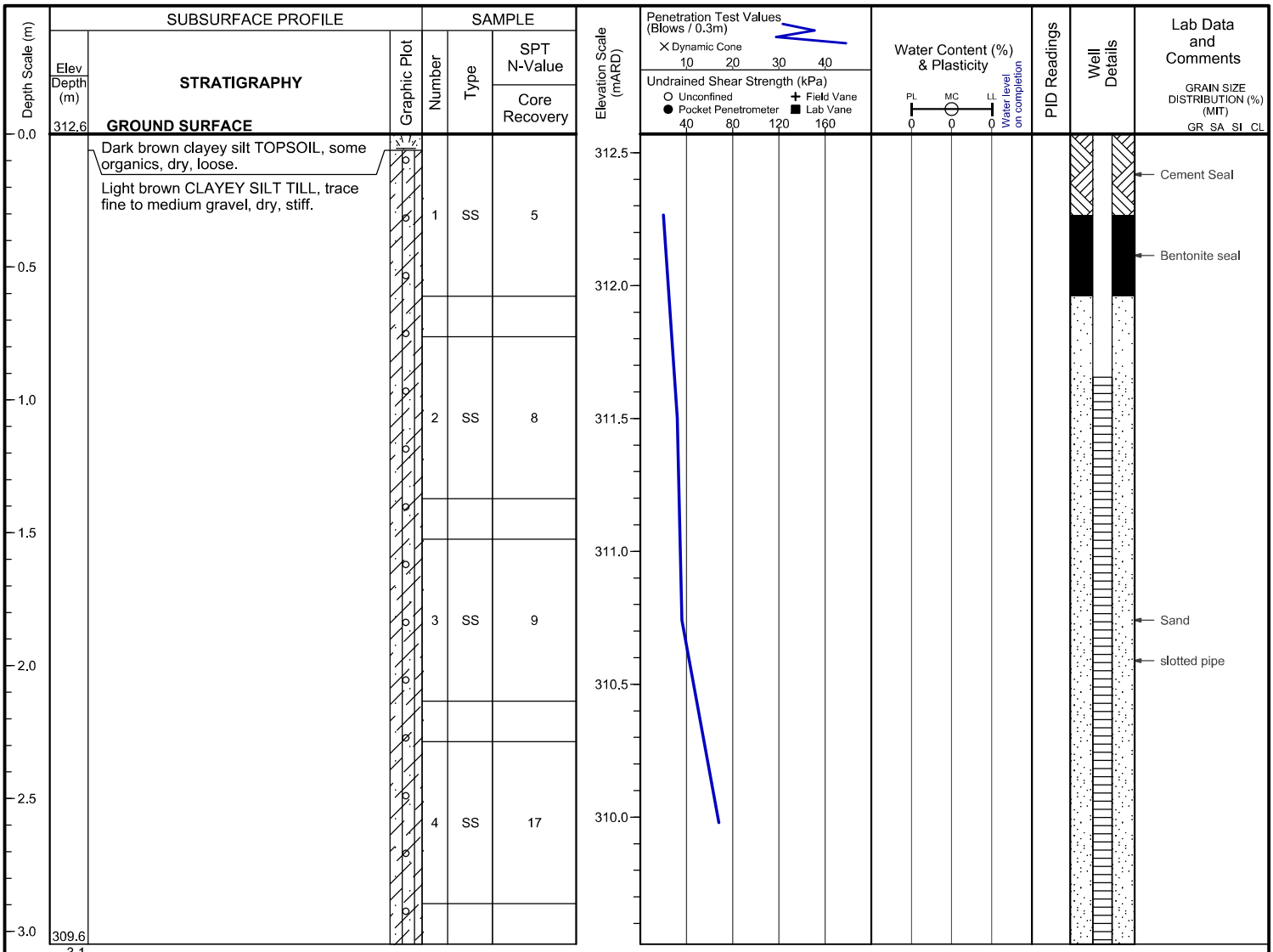
project | Oxford County Closed Landfills		**project no. |** 191-06761-02
client | County of Oxford	**rig type |** CME 75, track-mounted	**date started |** 2022-01-19
location | Gunn's Hill Landfill, Ontario	**method |** Hollow stem augers, 215 mm dia.	**supervisor |** MEQ
position |	**coring |** *n/a*	**reviewer |** AMS



Borehole was dry and open upon completion.

LOG OF BOREHOLE GH-GP2

project |	Oxford County Closed Landfills			**project no. |**	191-06761-02
client |	County of Oxford	**rig type |**	CME 75, track-mounted	**date started |**	2022-01-19
location |	Gunn's Hill Landfill, Ontario	**method |**	Hollow stem augers, 215 mm dia.	**supervisor |**	MEQ
position |		**coring |**	*n/a*	**reviewer |**	AMS



Borehole was open and dry upon completion.

40P2b

The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 4703235 | MUNICIP. 47007 | CON. CON 07

COUNTY ~~OR DISTRICT~~	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., ~~BLOCK, TRACT, SURVEY, ETC.~~	LOT
[redacted]	oxford E.	7	~~11/13~~ 014

[redacted]odstock R-4

DATE COMPLETED: DAY 17 MO 08 YR 71

[redacted] 67810 RC. 4 ELEVATION ~~1066~~ 1056 RC. 4 BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	TO
Yellowish	Clay		Hard	0	90
quicksand				90	160
grey	Clay	+ gravel mixture	hard	160	212
	Sand			212	213

31 | 0090505 | 0160 07 | 0212205N | 0213 09

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0212 (~~212-213~~)	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	TO
~~6~~ 06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	1.88	0	~~213~~ 0213
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET
MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER | PUMPING RATE: 0008 GPM. | DURATION OF PUMPING: 02 HOURS 00 MINS.

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY — 15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
080 FEET	090 (~~080~~) FEET	090 FEET	090 FEET	090 FEET	090 FEET

IF FLOWING, GIVE RATE: GPM. | PUMP INTAKE SET AT: 114 FEET | WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING: 114 FEET | RECOMMENDED PUMPING RATE: 0008 GPM.

0008 GPM./FT. SPECIFIC CAPACITY

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE

12

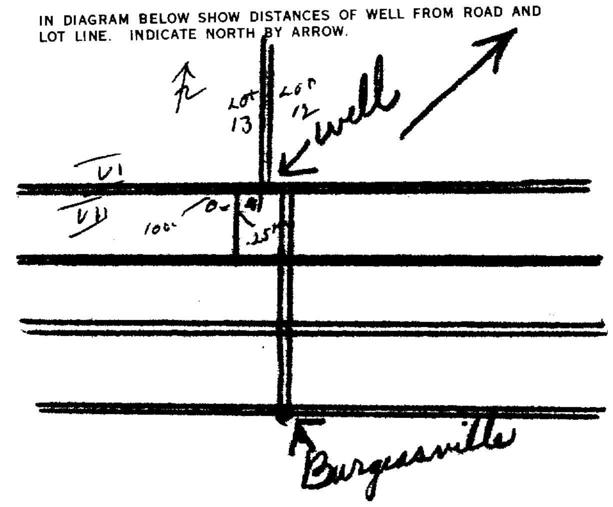
1 ☒ DOMESTIC 2 ☒ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING

1 ☒ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



Well is 100' S of Rd.
Well is 100' E of W. line

DRILLERS REMARKS:

CONTRACTOR

NAME OF WELL CONTRACTOR: Elgin Stewart | LICENCE NUMBER: 4804
ADDRESS: RR#3 Burgessville (Same)
NAME OF DRILLER OR BORER: Elgin Stewart | LICENCE NUMBER:
SIGNATURE OF CONTRACTOR | SUBMISSION DATE: DAY 17 MO 8 YR 71

OFFICE USE ONLY

DATA SOURCE: 1 | CONTRACTOR: 4804 | DATE RECEIVED: 080971
DATE OF INSPECTION: 6.12.71 | INSPECTOR: 21P
REMARKS:

OWRC COPY

Ministry of the Environment
Ontario

The Ontario Water Resources Act 40P/2B

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 4705875 | MUNICIP 47007 | CON. CON 06

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
OXFORD	EAST OXFORD	7 VI	13

[redacted] RR#4 Woodstock — DATE COMPLETED DAY 24 MO 4 YR 86

[redacted] 68010 | RC | ELEVATION 1070 | RC | BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

5 26220 4768010 1070

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BROWN	CLAY			0	4
GREY	CLAY	SAND	DENSE	4	89
GREY	CLAY	SAND STONES	CEMENTED	89	110
WHITE	SAND	STONES		110	215
GREY	CLAY	STONES		215	242
GREY	SHALE			242	244
GREY	LIMESTONE			244	248

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
247	☒ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
5½	☒ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE	188	0	244
5	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☒ OPEN HOLE		244	248
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET
MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

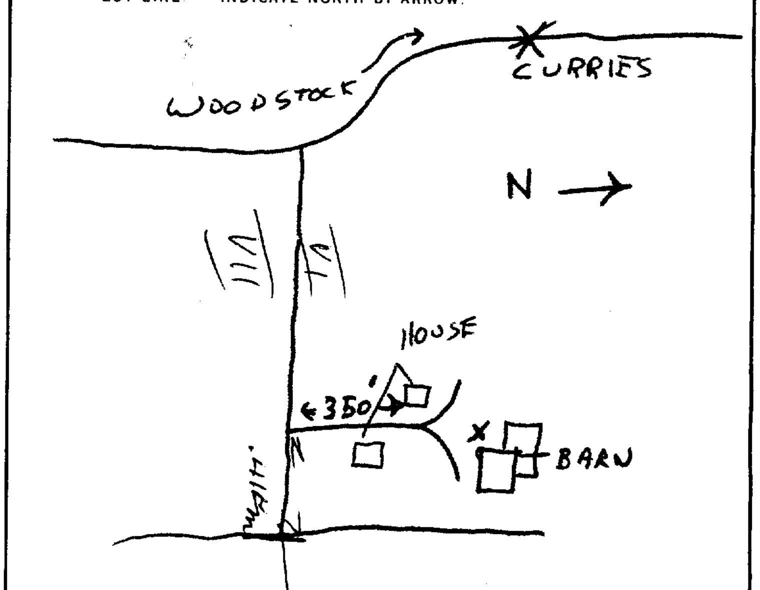
DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	AIR ☐ BAILER
PUMPING RATE	20 GPM
DURATION OF PUMPING	1 HOURS 30 MINS
STATIC LEVEL	90 FEET
WATER LEVEL END OF PUMPING	100 FEET
WATER LEVELS DURING	☒ PUMPING ☐ RECOVERY
15 MINUTES / 30 MINUTES / 45 MINUTES / 60 MINUTES	—
IF FLOWING, GIVE RATE	GPM
PUMP INTAKE SET AT	100 FEET
WATER AT END OF TEST	☒ CLEAR ☐ CLOUDY
RECOMMENDED PUMP TYPE	☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING	100 FEET
RECOMMENDED PUMPING RATE	20 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL

☒ WATER SUPPLY ☐ OBSERVATION WELL ☐ TEST HOLE ☐ RECHARGE WELL ☐ ABANDONED, INSUFFICIENT SUPPLY ☐ ABANDONED, POOR QUALITY ☐ UNFINISHED

WATER USE

☒ DOMESTIC ☐ STOCK ☐ IRRIGATION ☐ INDUSTRIAL ☐ OTHER ☐ COMMERCIAL ☐ MUNICIPAL ☐ PUBLIC SUPPLY ☐ COOLING OR AIR CONDITIONING ☐ NOT USED

METHOD OF DRILLING

☐ CABLE TOOL ☒ ROTARY (CONVENTIONAL) ☐ ROTARY (REVERSE) ☐ ROTARY (AIR) ☐ AIR PERCUSSION ☐ BORING ☐ DIAMOND ☐ JETTING ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: McLEOD WELL DRILLING LTD — LICENCE NUMBER 3563
ADDRESS: RR#4 INGERSOLL
NAME OF DRILLER OR BORER: DAVE OATMAN — LICENCE NUMBER 4009
SIGNATURE OF CONTRACTOR: Ralph McLeod
SUBMISSION DATE DAY ___ MO. ___ YR. ___

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR | DATE RECEIVED 010586
DATE OF INSPECTION 5 5 87 | INSPECTOR
REMARKS 7 7

CSS.58

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77 FORM 7

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. **Tag#: A188068**

A 188068

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
445262 GUNNSHILL ROAD	NORWICH	14	7

County/District/Municipality	City/Town/Village	Province	Postal Code
OXFORD	WOODSTOCK	Ontario	N4S7V8

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	525848	4767832		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
BRN	CLAY			0	13
BRN	CLAY	COBBLE	HARD	13	17
GRY	GRAVEL	SAND		17	42
GRY	SAND	GRAVEL		42	48

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	25	BENTONITE - BENSEAL	
25	48	GRAVEL	

Method of Construction

☐ Cable Tool ☐ Diamond
☑ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used
☑ Domestic ☐ Municipal ☐ Dewatering
☑ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 1/4	STEEL	.188	+2.5	38
6 1/4	STEEL	.188	46	48

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
6 5/8	STAINLESS STEEL	10	38	46

Status of Well

☑ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

Water Details

Water found at Depth (m/ft)	Gas	Kind of Water	Other, specify
38	☐	☑ Fresh ☐ Untested	
	☐	☐ Fresh ☐ Untested	
	☐	☐ Fresh ☐ Untested	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	48	9

Results of Well Yield Testing

After test of well yield, water was:
☑ Clear and sand free
☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM): 15

Duration of pumping: 2 hrs + 0 min

Final water level end of pumping (m/ft): 33

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft): 36

Recommended pump rate (l/min / GPM): 15

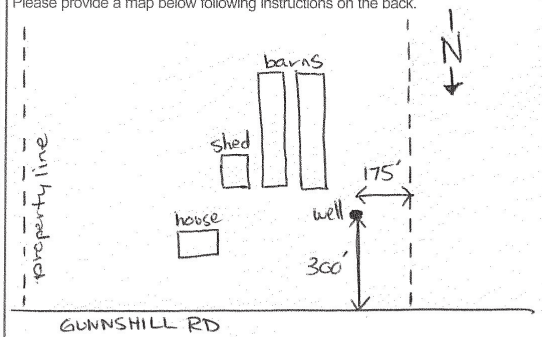
Well production (l/min / GPM): 18

Disinfected? ☑ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level		20.6		33.0
1		24.8	1	31.1
2		27.3	2	29.9
3		29.0	3	28.7
4		30.2	4	27.4
5		31.6	5	26.7
10		32.3	10	26.0
15		32.8	15	25.3
20		33.0	20	24.9
25		33.0	25	23.2
30		33.0	30	22.5
40		33.0	40	20.3
50		33.0	50	20.0
60		33.0	60	20.0

Map of Well Location

Please provide a map below following instructions on the back.



Comments: HIDDLETOWN LINE 3000' EAST

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
McLEOD WATER WELLS LTD.	7343

Business Address (Street Number/Name)	Municipality
9500 TOWNSEND LINE	KERWOOD

Province	Postal Code	Business E-mail Address
ONTARIO	N0M2B0	mcleodwaterwells@gmail.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5199473053	MITCHELL, WES

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3845		2015 09 22

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☑ Yes ☐ No	2015 09 21	2015 09 21

Ministry Use Only

Audit No Z221487

OCT 16 2015

506E (2014/11)

Ministry's Copy

Ministry of the Environment

Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 4706517 | MUNICIP 47007 | CON. CON 07

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC	LOT
[redacted]	[redacted]ORD	CON. 7	14

[redacted] R. 4, WOODSTOCK, ONTARIO

DATE COMPLETED: DAY 06 MO 12 YR 89

[redacted] 67763 | RC | ELEVATION 1000 | RC | BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BROWN	CLAY			0	3
GREY	CLAY	HARD		3	16
GREY	GRAVEL			16	37
GREY	GRAVEL	LOOSE		37	40

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
40	☑ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
5 ½	☑ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC	.188	0	37
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
10	6 INCHES	3 FEET

MATERIAL AND TYPE: Stainless Steel — DEPTH TO TOP OF SCREEN: 37-40 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: AIR ☐ BAILER	PUMPING RATE: 12 GPM	DURATION OF PUMPING: 1 HOURS 30 MINS	
STATIC LEVEL: 12 FEET	WATER LEVEL END OF PUMPING: 24 FEET	WATER LEVELS DURING ☐ PUMPING ☐ RECOVERY	15 MINUTES — 30 MINUTES — 45 MINUTES — 60 MINUTES —
IF FLOWING, GIVE RATE: GPM	PUMP INTAKE SET AT: 24 FEET	WATER AT END OF TEST: ☑ CLEAR ☐ CLOUDY	
RECOMMENDED PUMP TYPE: ☑ SHALLOW ☑ DEEP	RECOMMENDED PUMP SETTING: 24 FEET	RECOMMENDED PUMPING RATE: 12 GPM	

FINAL STATUS OF WELL

☑ WATER SUPPLY ☐ OBSERVATION WELL ☐ TEST HOLE ☐ RECHARGE WELL ☐ ABANDONED, INSUFFICIENT SUPPLY ☐ ABANDONED, POOR QUALITY ☐ UNFINISHED ☐ DEWATERING

WATER USE

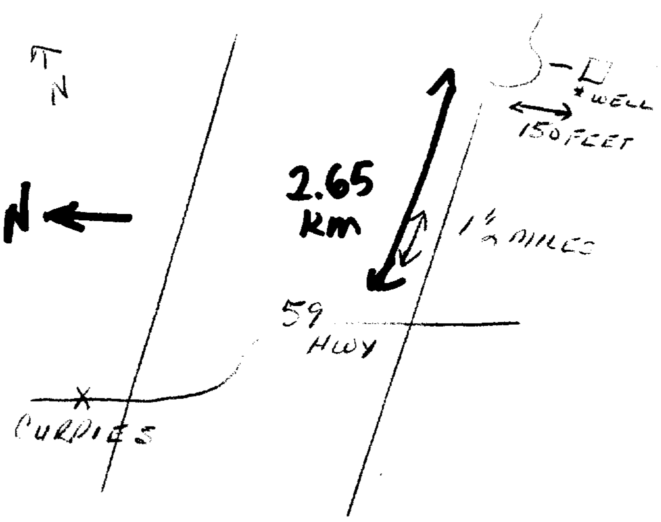
☑ DOMESTIC ☐ STOCK ☐ IRRIGATION ☐ INDUSTRIAL ☐ OTHER ☐ COMMERCIAL ☐ MUNICIPAL ☐ PUBLIC SUPPLY ☐ COOLING OR AIR CONDITIONING ☐ NOT USED

METHOD OF CONSTRUCTION

☐ CABLE TOOL ☑ ROTARY (CONVENTIONAL) ☐ ROTARY (REVERSE) ☑ ROTARY (AIR) ☐ AIR PERCUSSION ☐ BORING ☐ DIAMOND ☐ JETTING ☐ DRIVING ☐ DIGGING ☐ OTHER

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



46851

DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR: MC LEOD WELL DRILLING LTD	WELL CONTRACTOR'S LICENCE NUMBER: 3563
ADDRESS: R. R. 4, INGERSOLL, ONTARIO N5C 3J7	
NAME OF WELL TECHNICIAN: David D. Oatman	WELL TECHNICIAN'S LICENCE NUMBER: T-0067
SIGNATURE OF TECHNICIAN/CONTRACTOR: Ralph H. McLeod	SUBMISSION DATE: DAY MO. YR.

OFFICE USE ONLY

DATA SOURCE	CONTRACTOR 3563	DATE RECEIVED JUN 20 1989
DATE OF INSPECTION	INSPECTOR	
REMARKS		

CSS.38

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

APPENDIX

B

LABORATORY CERTIFICATES OF ANALYSIS

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

WSP Canada Inc.
Attn : Albert Siertsema

55 King Street, Suite 700
St. Catharines, ON
L2R 3H5, Canada

Phone: 905-687-1771 x 240
Fax:

Project : 191-06761-02-100-1002,
Blandford-Blenheim Landfill Site SW

30-March-2022

Date Rec. : 23 March 2022
LR Report: **CA40368-MAR22**
Reference: 191-06761-02-100-1002, Albert Siertsema

Copy: 1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: SW1	6: SW2	7: SW3	8: SW DUP	9: Trip Blank
Sample Date & Time					22-Mar-22 11:00	22-Mar-22 10:40	22-Mar-22 10:20	22-Mar-22	22-Mar-22
Temp Upon Receipt [°C]	***	***	***	***	***	***	***	***	***
BOD5 [mg/L]	23-Mar-22	17:18	28-Mar-22	15:20	< 4	4	< 4	< 4	---
Conductivity [uS/cm]	24-Mar-22	14:07	30-Mar-22	15:14	182	310	437	321	---
TSS [mg/L]	24-Mar-22	13:21	28-Mar-22	13:38	4	7	10	7	---
pH [No unit]	24-Mar-22	14:07	25-Mar-22	11:06	7.83	7.91	7.66	7.88	---
TDS [mg/L]	24-Mar-22	15:31	28-Mar-22	13:21	100	166	306	169	---
COD [mg/L]	25-Mar-22	09:55	28-Mar-22	15:20	< 8	28	25	27	---
Alkalinity [mg/L as CaCO3]	24-Mar-22	14:07	25-Mar-22	11:06	76	153	264	158	---
Cl [mg/L]	24-Mar-22	21:45	28-Mar-22	21:51	11	6.5	13	6.5	---
SO4 [mg/L]	24-Mar-22	21:45	28-Mar-22	16:39	2.0	2.2	5.0	2.2	---
NO2 [as N mg/L]	24-Mar-22	15:47	25-Mar-22	13:21	< 0.03	< 0.03	< 0.03	< 0.03	---
NO3 [as N mg/L]	24-Mar-22	15:47	25-Mar-22	13:21	< 0.06	0.76	0.07	0.76	---
NO2+NO3 [as N mg/L]	24-Mar-22	15:47	25-Mar-22	13:21	< 0.06	0.76	0.07	0.76	---
TKN [as N mg/L]	24-Mar-22	15:26	25-Mar-22	10:21	< 0.5	4.1	3.6	4.1	---
NH3+NH4 [as N mg/L]	24-Mar-22	16:21	25-Mar-22	12:25	< 0.1	3.8	3.2	3.8	---
Total P [mg/L]	26-Mar-22	10:42	28-Mar-22	11:22	< 0.03	< 0.03	< 0.03	< 0.03	---
4AAP-Phenolics [mg/L]	29-Mar-22	10:35	30-Mar-22	11:04	< 0.002	0.002	< 0.002	< 0.002	---
Hg (diss) [mg/L]	28-Mar-22	09:14	28-Mar-22	13:01	< 0.00001	< 0.00001	< 0.00001	< 0.00001	---
As (tot) [mg/L]	25-Mar-22	10:30	28-Mar-22	11:57	0.0003	0.0003	0.0006	0.0007	---

SGS Canada Inc.
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Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Project : 191-06761-02-100-1002, Blandford-Blenheim Landfill Site SW
LR Report : CA40368-MAR22

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: SW1	6: SW2	7: SW3	8: SW DUP	9: Trip Blank
Ba (tot) [mg/L]	25-Mar-22	10:30	28-Mar-22	11:57	0.00911	0.0219	0.0445	0.0228	---
B (tot) [mg/L]	25-Mar-22	10:30	30-Mar-22	13:45	0.006	0.055	0.078	0.060	---
Cd (tot) [mg/L]	25-Mar-22	10:30	28-Mar-22	11:57	0.000008	0.000030	0.000009	0.000042	---
Cr (tot) [mg/L]	25-Mar-22	10:30	28-Mar-22	11:57	0.00026	0.00037	0.00024	0.00048	---
Cu (tot) [mg/L]	25-Mar-22	10:30	28-Mar-22	11:57	0.0021	0.0029	0.0008	0.0024	---
Fe (tot) [mg/L]	25-Mar-22	10:30	28-Mar-22	11:57	0.088	1.26	1.41	1.31	---
Pb (tot) [mg/L]	25-Mar-22	10:30	28-Mar-22	11:57	0.00009	0.00125	0.00015	0.00125	---
Zn (tot) [mg/L]	25-Mar-22	10:30	28-Mar-22	11:57	0.004	0.005	0.005	0.006	---
Benzene [ug/L]	25-Mar-22	19:23	28-Mar-22	14:11	< 0.5	< 0.5	< 0.5	---	< 0.5
1,4-Dichlorobenzene [µg/L]	25-Mar-22	19:23	28-Mar-22	14:11	< 0.5	< 0.5	< 0.5	---	< 0.5
Dichloromethane [µg/L]	25-Mar-22	19:23	28-Mar-22	14:11	< 0.5	< 0.5	< 0.5	---	< 0.5
Toluene [ug/L]	25-Mar-22	19:23	28-Mar-22	14:11	< 0.5	< 0.5	< 0.5	---	< 0.5
Vinyl Chloride [µg/L]	25-Mar-22	19:23	28-Mar-22	14:11	< 0.2	< 0.2	< 0.2	---	< 0.2

Temperature of Sample upon Receipt: 3 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: N/A

Method Descriptions

Parameter	Description	SGS Method Code
1,4-Dichlorobenzene	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
4AAP-Phenolics	phenol by Skalar -solution	ME-CA-[ENV]SFA-LAK-AN-006
Alkalinity	Alkalinity by Titration	ME-CA-[ENV]EWL-LAK-AN-006
Ammonia+Ammonium (N)	NH3+NH4 by Skalar - solution	ME-CA-[ENV]SFA-LAK-AN-007
Arsenic (total)	Asby ICP-MS solution	ME-CA-[ENV]SPE-LAK-AN-006
Barium (total)	Ba by ICP-MS solution	ME-CA-[ENV]SPE-LAK-AN-006
Benzene	VOC wtr - BTEX	ME-CA-[ENV]GC-LAK-AN-004
Biochemical Oxygen Demand (BOD5)	Biochemical Oxygen Demand (BOD5)	ME-CA-[ENV]EWL-LAK-AN-007
Boron (total)	B by ICP-MS solution	ME-CA-[ENV]SPE-LAK-AN-006
Cadmium (total)	Cd by ICP-MS solution	ME-CA-[ENV]SPE-LAK-AN-006
Chemical Oxygen Demand	Chemical Oxygen Demand	ME-CA-[ENV]EWL-LAK-AN-009

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Parameter	Description	SGS Method Code
Chloride	Chloride by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
Chromium (total)	Cr by ICP-MS solution	ME-CA-[ENV]SPE-LAK-AN-006
Conductivity	Conductivity by Conductivity Meter	ME-CA-[ENV]EWL-LAK-AN-006
Copper (total)	Cu by ICP-MS solution	ME-CA-[ENV]SPE-LAK-AN-006
Dichloromethane	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
Iron (total)	Fe by ICP-MS solution	ME-CA-[ENV]SPE-LAK-AN-006
Lead (total)	Pb by ICP-MS solution	ME-CA-[ENV]SPE-LAK-AN-006
Mercury (dissolved)	Hg solutions by CVAAS	ME-CA-[ENV]SPE-LAK-AN-004
Nitrate (as N)	Nitrate by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
Nitrate + Nitrite (as N)	Total Nitrate/Nitrite by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
Nitrite (as N)	Nitrite by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
pH	pH - solution	ME-CA-[ENV]EWL-LAK-AN-006
Phosphorus (total)	Total Phos. By Skalar - complete digestion	ME-CA-[ENV]SFA-LAK-AN-003
Sulphate	Sulphate by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
Toluene	VOC wtr - BTEX	ME-CA-[ENV]GC-LAK-AN-004
Total Dissolved Solids	Total Dissolved Solids by Gravimetric	ME-CA-[ENV]EWL-LAK-AN-005
Total Kjeldahl Nitrogen	Tot. kjeldahl Nitrogen by Skalar	ME-CA-[ENV]SFA-LAK-AN-002
Total Suspended Solids	Total Suspended Solids	ME-CA-[ENV]EWL-LAK-AN-004
Vinyl Chloride	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
Zinc (total)	Zn by ICP-MS solution	ME-CA-[ENV]SPE-LAK-AN-006

Brad Moore Hon. B.Sc
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0002847042

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Project : 191-06761-02-100-1002, Blandford-Blenheim Landfill Site SW
LR Report : CA40368-MAR22

Quality Control Report

Organic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Volatile Organics - QCBatchID: GCM0469-MAR22														
1,4-Dichlorobenzene	0.5	ug/L	<0.5			ND	30	99	60	130	99	50	140	
Benzene	0.5	ug/L	<0.5			ND	30	100	60	130	100	50	140	
Dichloromethane	0.5	ug/L	<0.5			ND	30	99	60	130	99	50	140	
Toluene	0.5	ug/L	<0.5			ND	30	100	60	130	98	50	140	
Vinyl Chloride	0.2	ug/L	<0.2			ND	30	114	50	140	115	50	140	

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Alkalinity - QCBatchID: EWL0441-MAR22														
Alkalinity	2	mg/L as Ca	< 2			1	20	102	80	120	NA			
Alkalinity - QCBatchID: EWL0442-MAR22														
Alkalinity	2	mg/L as Ca	< 2			0	20	106	80	120	NA			
Ammonia by SFA - QCBatchID: SKA0217-MAR22														
Ammonia+Ammonium (N)	0.1	as N mg/L	<0.1			ND	10	100	90	110	93	75	125	
Anions by IC - QCBatchID: DIO0425-MAR22														
Nitrate (as N)	0.06	mg/L	<0.06			0	20	100	90	110	98	75	125	
Nitrate + Nitrite (as N)	0.06	mg/L	<0.06			NA		NA			NA			
Nitrite (as N)	0.03	mg/L	<0.03			ND	20	101	90	110	99	75	125	
Anions by IC - QCBatchID: DIO0465-MAR22														
Chloride	0.2	mg/L	<0.2			ND	20	103	90	110	108	75	125	
Anions by IC - QCBatchID: DIO0481-MAR22														
Sulphate	0.2	mg/L	<0.2			2	20	94	90	110	80	75	125	
Biochemical Oxygen Demand - QCBatchID: BOD0045-MAR22														
Biochemical Oxygen Demand (BOD5)	2	mg/L	< 2			17	30	108	70	130	97	70	130	
Chemical Oxygen Demand - QCBatchID: EWL0461-MAR22														
Chemical Oxygen Demand	8	mg/L	<8			11	20	90	80	120	110	75	125	
Conductivity - QCBatchID: EWL0441-MAR22														
Conductivity	2	uS/cm	< 2			9	20	99	90	110	NA			
Conductivity - QCBatchID: EWL0442-MAR22														
Conductivity	2	uS/cm	< 2			0	20	100	90	110	NA			
Mercury by CVAAS - QCBatchID: EHG0046-MAR22														
Mercury (dissolved)	0.00001	mg/L	< 0.00001			ND	20	82	80	120	116	70	130	
Metals in aqueous samples - ICP-MS - QCBatchID: EMS0196-MAR22														

SGS Canada Inc.
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Lakefield - Ontario - KOL 2HO
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Project : 191-06761-02-100-1002, Blandford-Blenheim Landfill Site SW
LR Report : CA40368-MAR22

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Arsenic (total)	0.0002	mg/L	<0.0002			ND	20	109	90	110	118	70	130	
Barium (total)	0.00002	mg/L	<0.00002			0	20	95	90	110	108	70	130	
Boron (total)	0.002	mg/L	<0.002			ND	20	100	90	110	91	70	130	
Cadmium (total)	0.000003	mg/L	<0.000003			ND	20	96	90	110	103	70	130	
Chromium (total)	0.00008	mg/L	<0.00008			ND	20	92	90	110	88	70	130	
Copper (total)	0.0002	mg/L	<0.0002			ND	20	99	90	110	108	70	130	
Iron (total)	0.007	mg/L	<0.007			ND	20	107	90	110	108	70	130	
Lead (total)	0.00009	mg/L	<0.00001			ND	20	95	90	110	89	70	130	
Zinc (total)	0.002	mg/L	<0.002			ND	20	108	90	110	108	70	130	
Metals in aqueous samples - ICP-MS - QCBatchID: EMS0206-MAR22														
Boron (total)	0.002	mg/L	<0.002			2	20	101	90	110	100	70	130	
pH - QCBatchID: EWL0441-MAR22														
pH	0.05	No unit	NA			0		100			NA			
pH - QCBatchID: EWL0442-MAR22														
pH	0.05	No unit	NA			0		100			NA			
Phenols by SFA - QCBatchID: SKA0253-MAR22														
4AAP-Phenolics	0.002	mg/L	<0.002			ND	10	96	80	120	93	75	125	
Phenols by SFA - QCBatchID: SKA0260-MAR22														
4AAP-Phenolics	0.002	mg/L	<0.002			ND	10	102	80	120	100	75	125	
Phosphorus by SFA - QCBatchID: SKA0234-MAR22														
Phosphorus (total)	0.03	mg/L	<0.03			ND	10	94	90	110	94	75	125	
Solids Analysis - QCBatchID: EWL0446-MAR22														
Total Dissolved Solids	30	mg/L	<30			2	20	92	90	110	NA			
Suspended Solids - QCBatchID: EWL0435-MAR22														
Total Suspended Solids	2	mg/L	< 2			1	10	104	90	110	NA			
Suspended Solids - QCBatchID: EWL0453-MAR22														
Total Suspended Solids	2	mg/L	< 2			1	10	95	90	110	NA			
Total Nitrogen - QCBatchID: SKA0220-MAR22														
Total Kjeldahl Nitrogen	0.5	as N mg/L	<0.5			1	10	103	90	110	103	75	125	

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
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Project : 191-06761-02-100-1002,
Gunn's Hill Landfill Site - GW

28-April-2022

WSP Canada Inc.
Attn : Albert Siertsema

55 King Street, Suite 700
St. Catharines, ON
L2R 3H5, Canada

Phone: 905-687-1771 x 240
Fax:

Date Rec. : 18 April 2022
LR Report: **CA12714-APR22**
Reference: 191-06761-02-100-1002,
Albert Siertsema

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	7: BB-BH 1-1	8: BB-BH 1-2
Sample Date & Time					18-Apr-22 09:45	18-Apr-22 10:00
Temp Upon Receipt [°C]	***	***	***	***	***	***
Alkalinity [mg/L as CaCO3]	19-Apr-22	15:05	20-Apr-22	15:25	304	1150
pH [No unit]	19-Apr-22	15:05	20-Apr-22	15:25	7.86	7.15
Conductivity [uS/cm]	19-Apr-22	15:05	20-Apr-22	15:25	573	2110
TDS [mg/L]	19-Apr-22	08:48	20-Apr-22	14:17	331	780
COD [mg/L]	20-Apr-22	12:16	20-Apr-22	16:02	< 8	116
NH3+NH4 [as N mg/L]	22-Apr-22	09:10	25-Apr-22	15:20	< 0.1	112
TKN [as N mg/L]	19-Apr-22	15:13	22-Apr-22	14:46	2.46	122
Total P [mg/L]	19-Apr-22	15:32	20-Apr-22	08:40	0.12	0.60
4AAP-Phenolics [mg/L]	21-Apr-22	09:33	21-Apr-22	18:41	< 0.002	0.008
SO4 [mg/L]	21-Apr-22	10:48	22-Apr-22	16:45	12	< 2
Cl [mg/L]	21-Apr-22	12:17	25-Apr-22	09:51	15	31
NO2 [as N mg/L]	20-Apr-22	07:27	22-Apr-22	14:40	< 0.03	< 0.3
NO3 [as N mg/L]	20-Apr-22	07:27	22-Apr-22	14:40	2.53	< 0.06
DOC [mg/L]	20-Apr-22	13:37	22-Apr-22	09:58	2	27
Hg (diss) [mg/L]	21-Apr-22	09:00	22-Apr-22	09:35	< 0.00001	< 0.00001
As (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	0.0004	0.0014
Ba (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	0.0398	0.217
B (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	0.125	0.765
Ca (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	92.4	184
Cd (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	0.000137	0.000003
Cr (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	0.00014	0.00376
Cu (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	0.0022	0.0006
Fe (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	0.045	44.3
K (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	3.81	70.4
Mg (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	18.9	48.9

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Project : 191-06761-02-100-1002, Gunn's Hill Landfill Site - GW
LR Report : CA12714-APR22

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	7: BB-BH 1-1	8: BB-BH 1-2
Mn (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	0.657	0.701
Na (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	4.30	50.4
Pb (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	0.00014	< 0.00009
Zn (diss) [mg/L]	22-Apr-22	19:46	25-Apr-22	10:19	0.026	0.011
Benzene [µg/L]	26-Apr-22	13:00	28-Apr-22	16:44	< 0.5	5.9
1,4-Dichlorobenzene [µg/L]	26-Apr-22	13:00	28-Apr-22	16:44	< 0.5	2.6
Dichloromethane [µg/L]	26-Apr-22	13:00	28-Apr-22	16:44	< 0.5	< 0.5
Toluene [ug/L]	26-Apr-22	13:00	28-Apr-22	16:44	< 0.5	0.5
Vinyl Chloride [µg/L]	26-Apr-22	13:00	28-Apr-22	16:44	< 0.2	< 0.2

Temperature of Sample upon Receipt: 2 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: N/A

Raised RL for NO2 on BB-BH 1-2 due to sample matrix

Method Descriptions

Parameter	Description	SGS Method Code
1,4-Dichlorobenzene	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
4AAP-Phenolics	phenol by Skalar -solution	ME-CA-[ENV]SFA-LAK-AN-006
Alkalinity	Alkalinity by Titration	ME-CA-[ENV]EWL-LAK-AN-006
Ammonia+Ammonium (N)	NH3+NH4 by Skalar - solution	ME-CA-[ENV]SFA-LAK-AN-007
Arsenic (dissolved)	As by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Barium (dissolved)	Ba by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Benzene	VOC wtr - BTEX	ME-CA-[ENV]GC-LAK-AN-004
Boron (dissolved)	B by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Cadmium (dissolved)	Cd by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Calcium (dissolved)	Ca by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Chemical Oxygen Demand	Chemical Oxygen Demand	ME-CA-[ENV]EWL-LAK-AN-009
Chloride	Chloride by discrete colourmetric analysis	ME-CA-[ENV]EWL-LAK-AN-026
Chromium (dissolved)	Cr by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Conductivity	Conductivity by Conductivity Meter	ME-CA-[ENV]EWL-LAK-AN-006
Copper (dissolved)	Cu by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Dichloromethane	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
Dissolved Organic Carbon	DOC by Skalar	ME-CA-[ENV]SFA-LAK-AN-009
Iron (dissolved)	Fe by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Lead (dissolved)	Pb by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Magnesium (dissolved)	Mg by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Manganese (dissolved)	Mn by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Mercury (dissolved)	Hg solutions by CVAAS	ME-CA-[ENV]SPE-LAK-AN-004
Nitrate (as N)	Nitrate by Dionex - solution	ME-CA-[ENV]IC-LAK-AN-001
Nitrite (as N)	Nitrite by Dionex - solution	ME-CA-[ENV]IC-LAK-AN-001
pH	pH - solution	ME-CA-[ENV]EWL-LAK-AN-006

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Parameter	Description	SGS Method Code
Phosphorus (total)	Total Phos. By Skalar - complete digestion	ME-CA-[ENV]SFA-LAK-AN-003
Potassium (dissolved)	K by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Sodium (dissolved)	Na by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Sulphate	Sulphate by discrete colourmetric analysis	ME-CA-[ENV]EWL-LAK-AN-026
Toluene	VOC wtr - BTEX	ME-CA-[ENV]GC-LAK-AN-004
Total Dissolved Solids	Total Dissolved Solids by Gravimetric	ME-CA-[ENV]EWL-LAK-AN-005
Total Kjeldahl Nitrogen (N)	Tot. kjeldahl Nitrogen by Skalar - drinking water	ME-CA-[ENV]SFA-LAK-AN-002
Vinyl Chloride	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
Zinc (dissolved)	Zn by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006

Maarit Wolfe, Hon.B.Sc
Project Specialist,
Environment, Health & Safety

OnLine LIMS

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Project : 191-06761-02-100-1002, Gunn's Hill Landfill Site - GW
LR Report : CA12714-APR22

Quality Control Report

Organic Analysis													
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material		
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
							%		Low	High		Low	High
Volatile Organics - QCBatchID: GCM0448-APR22													
1,4-Dichlorobenzene	0.5	ug/L	<0.5			ND	30	100	60	130	99	50	140
Benzene	0.5	µg/L	<0.5			ND	30	96	60	130	98	50	140
Dichloromethane	0.5	ug/L	<0.5			ND	30	94	60	130	96	50	140
Toluene	0.5	ug/L	<0.5			ND	30	97	60	130	97	50	140
Vinyl Chloride	0.2	ug/L	<0.2			ND	30	94	50	140	95	50	140

Inorganic Analysis													
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material		
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
							%		Low	High		Low	High
Alkalinity - QCBatchID: EWL0359-APR22													
Alkalinity	2	mg/L as Ca	< 2			1	20	109	80	120	NA		
Ammonia by SFA - QCBatchID: SKA0218-APR22													
Ammonia+Ammonium (N)	0.1	as N mg/L	<0.1			0	10	97	90	110	98	75	125
Ammonia by SFA - QCBatchID: SKA0241-APR22													
Ammonia+Ammonium (N)	0.1	as N mg/L	<0.1			1	10	101	90	110	NV	75	125
Anions by discrete analyzer - QCBatchID: DIO5065-APR22													
Sulphate	2	mg/L	<2			0	20	100	80	120	93	75	125
Anions by discrete analyzer - QCBatchID: DIO5067-APR22													
Chloride	1	mg/L	<1			0	20	94	80	120	80	75	125
Anions by IC - QCBatchID: DIO0356-APR22													
Nitrate (as N)	0.06	mg/L	<0.06			ND	20	99	90	110	100	75	125
Nitrite (as N)	0.03	mg/L	<0.03			ND	20	98	90	110	101	75	125
Anions by IC - QCBatchID: DIO0371-APR22													
Nitrite (as N)	0.03	mg/L	<0.03			6	20	100	90	110	101	75	125
Carbon by SFA - QCBatchID: SKA0209-APR22													
Dissolved Organic Carbon	1	mg/L	<1			1	20	103	90	110	93	75	125
Chemical Oxygen Demand - QCBatchID: EWL0382-APR22													
Chemical Oxygen Demand	8	mg/L	<8			3	20	116	80	120	115	75	125
Conductivity - QCBatchID: EWL0359-APR22													
Conductivity	2	uS/cm	< 2			1	20	98	90	110	NA		
Mercury by CVAAS - QCBatchID: EHG0040-APR22													
Mercury (dissolved)	0.00001	mg/L	< 0.00001			0	20	83	80	120	91	70	130
Metals in aqueous samples - ICP-MS - QCBatchID: EMS0159-APR22													
Arsenic (dissolved)	0.0002	mg/L	<0.0002			ND	20	100	90	110	102	70	130

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LR Report : **CA12714-APR22**

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Barium (dissolved)	0.00008	mg/L	<0.00002			1	20	100	90	110	102	70	130	
Boron (dissolved)	0.002	mg/L	<0.002			1	20	94	90	110	102	70	130	
Cadmium (dissolved)	0.000003	mg/L	<0.000003			8	20	103	90	110	110	70	130	
Calcium (dissolved)	0.01	mg/L	<0.01			2	20	102	90	110	84	70	130	
Chromium (dissolved)	0.00008	mg/L	<0.00008			ND	20	99	90	110	91	70	130	
Copper (dissolved)	0.0002	mg/L	<0.0002			ND	20	98	90	110	97	70	130	
Iron (dissolved)	0.007	mg/L	<0.007			4	20	100	90	110	75	70	130	
Lead (dissolved)	0.00009	mg/L	<0.00001			2	20	99	90	110	96	70	130	
Magnesium (dissolved)	0.001	mg/L	<0.001			1	20	103	90	110	93	70	130	
Manganese (dissolved)	0.00001	mg/L	<0.00001			1	20	105	90	110	103	70	130	
Potassium (dissolved)	0.009	mg/L	<0.009			3	20	101	90	110	90	70	130	
Sodium (dissolved)	0.01	mg/L	<0.01			15	20	106	90	110	98	70	130	
Zinc (dissolved)	0.002	mg/L	<0.002			2	20	107	90	110	100	70	130	
pH - QCBatchID: EWL0359-APR22														
pH	0.05	No unit	NA			0		100			NA			
Phenols by SFA - QCBatchID: SKA0202-APR22														
4AAP-Phenolics	0.002	mg/L	<0.002			ND	10	103	80	120	99	75	125	
Phosphorus by SFA - QCBatchID: SKA0173-APR22														
Phosphorus (total)	0.03	mg/L	<0.03			ND	10	100	90	110	86	75	125	
Solids Analysis - QCBatchID: EWL0344-APR22														
Total Dissolved Solids	30	mg/L	<30			2	20	91	80	120	NA			
Total Nitrogen - QCBatchID: SKA0197-APR22														
Total Kjeldahl Nitrogen (N)	0.05	mg/L	<0.05			6	10	100	90	110	93	75	125	
Total Nitrogen - QCBatchID: SKA0217-APR22														
Total Kjeldahl Nitrogen (N)	0.05	mg/L	<0.05			ND	10	100	90	110	93	75	125	

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06-May-2022

WSP Canada Inc.
Attn : Albert Siertsema

55 King Street, Suite 700
St. Catharines, ON
L2R 3H5, Canada

Phone: 905-687-1771 x 240
Fax:

Date Rec. : 12 April 2022
LR Report: **CA40213-APR22**
Reference: 191-06761-02-100-1002, Albert Siertsema

Copy: 1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: RL	6: BB-MW1
Sample Date & Time						11-Apr-22 09:00
Temp Upon Receipt [°C]	***	***	***	***	***	***
Total P [mg/L]	02-May-22	17:19	03-May-22	16:19	0.03	0.73
pH [No unit]	14-Apr-22	13:18	18-Apr-22	10:04	0.05	7.93
Conductivity [uS/cm]	14-Apr-22	13:18	18-Apr-22	10:04	2	1190
Alkalinity [mg/L as CaCO3]	14-Apr-22	13:18	18-Apr-22	10:04	2	597
DOC [mg/L]	27-Apr-22	14:27	06-May-22	09:59	1.0	9.3
Cl [mg/L]	18-Apr-22	08:54	20-Apr-22	14:10	1	48
SO4 [mg/L]	21-Apr-22	10:48	27-Apr-22	14:40	2	22
NO2 [as N mg/L]	15-Apr-22	07:03	20-Apr-22	14:44	0.03	< 0.03
NO3 [as N mg/L]	15-Apr-22	07:03	20-Apr-22	14:44	0.06	< 0.06
4AAP-Phenolics [mg/L]	18-Apr-22	10:37	18-Apr-22	15:28	0.002	< 0.002
Hg (diss) [mg/L]	18-Apr-22	08:03	18-Apr-22	11:30	1e-005	< 0.00001
Ca (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17	0.01	118
Mg (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17	0.001	45.5
Na (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17	0.01	35.4
K (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17	0.009	15.4
Hardness [mg/L as CaCO3]	18-Apr-22	21:30	19-Apr-22	10:17		483
As (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17		0.0005
Ba (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17		0.519
B (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17		0.176
Cd (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17		< 0.000003
Cr (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17		0.00064
Cu (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17		0.0003
Fe (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17		3.84
Pb (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17		< 0.00009
Mn (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17		0.0972

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Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: RL	6: BB-MW1
Zn (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:17		0.002
TDS [mg/L]	13-Apr-22	18:14	18-Apr-22	13:24	30	617
COD [mg/L]	14-Apr-22	08:00	18-Apr-22	12:55	8	30
TKN [as N mg/L]	13-Apr-22	16:05	18-Apr-22	13:12	0.5	24.6
NH3+NH4 [as N mg/L]	13 Apr 22	20:45	18-Apr-22	11:31	0.1	23.9
Benzene [ug/L]	20-Apr-22	18:22	26-Apr-22	13:56		< 0.5
1,4-Dichlorobenzene [µg/L]	20-Apr-22	18:22	26-Apr-22	13:56		< 0.5
Dichloromethane [µg/L]	20-Apr-22	18:22	26-Apr-22	13:56		< 0.5
Toluene [ug/L]	20-Apr-22	18:22	26-Apr-22	13:56		< 0.5
Vinyl Chloride [µg/L]	20-Apr-22	18:22	26-Apr-22	13:56		< 0.2

Analysis	7: BB-MW2	8: BB-MW3	9: BB-P1	10: BB-BWDUP	11: Trip Blank
Sample Date & Time	11-Apr-22 11:00	11-Apr-22 11:45	11-Apr-22 10:30	11-Apr-22	11-Apr-22
Temp Upon Receipt [°C]	***	***	***	***	***
Total P [mg/L]	0.05	< 0.03	< 0.03	< 0.03	---
pH [No unit]	8.13	8.20	8.08	8.06	---
Conductivity [uS/cm]	651	381	557	561	---
Alkalinity [mg/L as CaCO3]	248	213	295	297	---
DOC [mg/L]	1.1	1.3	1.5	1.4	---
Cl [mg/L]	27	3	2	2	---
SO4 [mg/L]	73	7	5	5	---
NO2 [as N mg/L]	0.14	< 0.03	< 0.03	< 0.03	---
NO3 [as N mg/L]	0.70	0.34	5.28	5.28	---
4AAP-Phenolics [mg/L]	< 0.002	< 0.002	< 0.002	< 0.002	---
Hg (diss) [mg/L]	< 0.00001	< 0.00001	< 0.00001	< 0.00001	---
Ca (diss) [mg/L]	90.5	56.3	82.3	83.4	---
Mg (diss) [mg/L]	31.1	10.9	22.4	22.3	---
Na (diss) [mg/L]	5.02	13.2	4.94	4.82	---
K (diss) [mg/L]	1.34	0.833	5.12	5.16	---
Hardness [mg/L as CaCO3]	354	186	298	300	---
As (diss) [mg/L]	0.0011	0.0009	< 0.0002	< 0.0002	---
Ba (diss) [mg/L]	0.0633	0.0104	0.0304	0.0301	---
B (diss) [mg/L]	0.013	0.018	0.045	0.046	---
Cd (diss) [mg/L]	0.000005	0.000003	0.000007	0.000006	---
Cr (diss) [mg/L]	0.00014	0.00057	0.00096	0.00067	---
Cu (diss) [mg/L]	0.0008	0.0011	0.0048	0.0046	---
Fe (diss) [mg/L]	0.198	< 0.007	< 0.007	< 0.007	---
Pb (diss) [mg/L]	0.00019	< 0.00009	0.00017	0.00017	---
Mn (diss) [mg/L]	0.0318	0.00477	0.00024	0.00029	---

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LR Report : CA40213-APR22

Analysis	7: BB-MW2	8: BB-MW3	9: BB-P1	10: BB-BWDUP	11: Trip Blank
Zn (diss) [mg/L]	0.004	0.003	0.218	0.202	---
TDS [mg/L]	420	234	346	317	---
COD [mg/L]	11	< 8	< 8	< 8	---
TKN [as N mg/L]	< 0.5	1.6	< 0.5	< 0.5	---
NH3+NH4 [as N mg/L]	0.2	< 0.1	< 0.1	< 0.1	---
Benzene [ug/L]	< 0.5	< 0.5	< 0.5	---	< 0.5
1,4-Dichlorobenzene [µg/L]	< 0.5	< 0.5	< 0.5	---	< 0.5
Dichloromethane [µg/L]	< 0.5	< 0.5	< 0.5	---	< 0.5
Toluene [ug/L]	< 0.5	< 0.5	< 0.5	---	< 0.5
Vinyl Chloride [µg/L]	< 0.2	< 0.2	< 0.2	---	< 0.2

Temperature of Sample upon Receipt: 7 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Method Descriptions

Parameter	Description	SGS Method Code
1,4-Dichlorobenzene	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
4AAP-Phenolics	phenol by Skalar -solution	ME-CA-[ENV]SFA-LAK-AN-006
Alkalinity	Alkalinity by Titration	ME-CA-[ENV]EWL-LAK-AN-006
Ammonia+Ammonium (N)	NH3+NH4 by Skalar - solution	ME-CA-[ENV]SFA-LAK-AN-007
Arsenic (dissolved)	As by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Barium (dissolved)	Ba by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Benzene	VOC wtr - BTEX	ME-CA-[ENV]GC-LAK-AN-004
Boron (dissolved)	B by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Cadmium (dissolved)	Cd by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Calcium (dissolved)	Ca by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Chemical Oxygen Demand	Chemical Oxygen Demand	ME-CA-[ENV]EWL-LAK-AN-009
Chloride	Chloride by discrete colourmetric analysis	ME-CA-[ENV]EWL-LAK-AN-026
Chromium (dissolved)	Cr by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Conductivity	Conductivity by Conductivity Meter	ME-CA-[ENV]EWL-LAK-AN-006
Copper (dissolved)	Cu by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Dichloromethane	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
Dissolved Organic Carbon	DOC by Combustion/Oxidation	ME-CA-[ENV]EWL-LAK-AN-023
Hardness (dissolved)	Hardness (CaCO3) by ICP-MS dissolved	ME-CA-[ENV]SPE-LAK-AN-006
Iron (dissolved)	Fe by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Lead (dissolved)	Pb by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Magnesium (dissolved)	Mg by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Manganese (dissolved)	Mn by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Mercury (dissolved)	Hg solutions by CVAAS	ME-CA-[ENV]SPE-LAK-AN-004
Nitrate (as N)	Nitrate by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
Nitrite (as N)	Nitrite by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
pH	pH - solution	ME-CA-[ENV]EWL-LAK-AN-006
Phosphorus (total)	Total Phos. By Skalar - complete digestion	ME-CA-[ENV]SFA-LAK-AN-003
Potassium (dissolved)	K by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006

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Project : 191-06761-02-100-1002, Blandford-Blenheim Landfill Site - GW
LR Report : CA40213-APR22

Parameter	Description	SGS Method Code
Sodium (dissolved)	Na by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Sulphate	Sulphate by discrete colourmetric analysis	ME-CA-[ENV]EWL-LAK-AN-026
Toluene	VOC wtr - BTEX	ME-CA-[ENV]GC-LAK-AN-004
Total Dissolved Solids	Total Dissolved Solids by Gravimetric	ME-CA-[ENV]EWL-LAK-AN-005
Total Kjeldahl Nitrogen	Tot. kjeldahl Nitrogen by Skalar	ME-CA-[ENV]SFA-LAK-AN-002
Vinyl Chloride	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
Zinc (dissolved)	Zn by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006

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SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Project : 191-06761-02-100-1002, Blandford-Blenheim Landfill Site - GW
LR Report : CA40213-APR22

Quality Control Report

Organic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Volatile Organics - QCBatchID: GCM0339-APR22														
1,4-Dichlorobenzene	0.5	ug/L	<0.5			ND	30	91	60	130	93	50	140	
Benzene	0.5	ug/L	<0.5			ND	30	90	60	130	94	50	140	
Dichloromethane	0.5	ug/L	<0.5			ND	30	89	60	130	88	50	140	
Toluene	0.5	ug/L	<0.5			ND	30	90	60	130	92	50	140	
Vinyl Chloride	0.2	ug/L	<0.2			ND	30	90	50	140	92	50	140	

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Alkalinity - QCBatchID: EWL0285-APR22														
Alkalinity	2	mg/L as Ca	< 2			0	20	104	80	120	NA			
Ammonia by SFA - QCBatchID: SKA0125-APR22														
Ammonia+Ammonium (N)	0.1	as N mg/L	<0.1			0	10	96	90	110	98	75	125	
Ammonia by SFA - QCBatchID: SKA0140-APR22														
Ammonia+Ammonium (N)	0.1	as N mg/L	< 0.1			6	10	100	90	110	93	75	125	
Anions by discrete analyzer - QCBatchID: DIO5050-APR22														
Chloride	1	mg/L	<1			1	20	109	80	120	100	75	125	
Anions by discrete analyzer - QCBatchID: DIO5052-APR22														
Chloride	1	mg/L	<1			0	20	108	80	120	101	75	125	
Anions by discrete analyzer - QCBatchID: DIO5065-APR22														
Sulphate	2	mg/L	<2			0	20	100	80	120	93	75	125	
Anions by discrete analyzer - QCBatchID: DIO5078-APR22														
Sulphate	2	mg/L	<2			ND	20	97	80	120	106	75	125	
Anions by IC - QCBatchID: DIO0265-APR22														
Nitrate (as N)	0.06	mg/L	<0.06			ND	20	99	90	110	99	75	125	
Nitrite (as N)	0.03	mg/L	<0.03			ND	20	98	90	110	101	75	125	
Anions by IC - QCBatchID: DIO0274-APR22														
Nitrate (as N)	0.06	mg/L	<0.06			0	20	98	90	110	95	75	125	
Nitrite (as N)	0.03	mg/L	<0.03			0	20	101	90	110	101	75	125	
Anions by IC - QCBatchID: DIO0275-APR22														
Nitrate (as N)	0.06	mg/L	<0.06			ND	20	100	90	110	100	75	125	
Nitrite (as N)	0.03	mg/L	<0.03			ND	20	93	90	110	95	75	125	
Chemical Oxygen Demand - QCBatchID: EWL0268-APR22														
Chemical Oxygen Demand	8	mg/L	<8			0	20	108	80	120	97	75	125	

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LR Report : CA40213-APR22

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Chemical Oxygen Demand - QCBatchID: EWL0269-APR22														
Chemical Oxygen Demand	8	mg/L	<8			ND	20	118	80	120	110	75	125	
Conductivity - QCBatchID: EWL0285-APR22														
Conductivity	2	uS/cm	< 2			0	20	97	90	110	NA			
Mercury by CVAAS - QCBatchID: EHG0031-APR22														
Mercury (dissolved)	0.00001	mg/L	< 0.00001			ND	20	117	80	120	97	70	130	
Metals in aqueous samples - ICP-MS - QCBatchID: EMS0121-APR22														
Arsenic (dissolved)	0.0002	mg/L	<0.0002			6	20	101	90	110	111	70	130	
Barium (dissolved)	0.00002	mg/L	<0.00002			0	20	100	90	110	95	70	130	
Boron (dissolved)	0.002	mg/L	<0.002			1	20	94	90	110	94	70	130	
Cadmium (dissolved)	0.000003	mg/L	<0.000003			ND	20	105	90	110	87	70	130	
Calcium (dissolved)	0.01	mg/L	<0.01			3	20	100	90	110	81	70	130	
Chromium (dissolved)	0.00008	mg/L	<0.00008			10	20	101	90	110	79	70	130	
Copper (dissolved)	0.0002	mg/L	<0.0002			1	20	103	90	110	101	70	130	
Iron (dissolved)	0.007	mg/L	<0.007			0	20	102	90	110	125	70	130	
Lead (dissolved)	0.00009	mg/L	<0.00001			2	20	96	90	110	78	70	130	
Magnesium (dissolved)	0.001	mg/L	<0.001			2	20	99	90	110	97	70	130	
Manganese (dissolved)	0.00001	mg/L	<0.00001			0	20	103	90	110	103	70	130	
Potassium (dissolved)	0.009	mg/L	<0.009			2	20	99	90	110	102	70	130	
Sodium (dissolved)	0.01	mg/L	<0.01			5	20	100	90	110	100	70	130	
Zinc (dissolved)	0.002	mg/L	<0.002			12	20	103	90	110	104	70	130	
pH - QCBatchID: EWL0285-APR22														
pH	0.05	No unit	NA			0		100			NA			
Phenols by SFA - QCBatchID: SKA0154-APR22														
4AAP-Phenolics	0.002	mg/L	<0.002			ND	10	111	80	120	NV	75	125	
Phosphorus by SFA - QCBatchID: SKA0011-MAY22														
Phosphorus (total)	0.03	mg/L	<0.03			ND	10	100	90	110	94	75	125	
Phosphorus by SFA - QCBatchID: SKA0035-MAY22														
Phosphorus (total)	0.03	mg/L	<0.03			1	10	105	90	110	NV	75	125	
Solids Analysis - QCBatchID: EWL0241-APR22														
Total Dissolved Solids	30	mg/L	<30			6	20	101	80	120	NA			
Solids Analysis - QCBatchID: EWL0262-APR22														
Total Dissolved Solids	30	mg/L	<30			5	20	95	80	120	NA			
Total Nitrogen - QCBatchID: SKA0124-APR22														
Total Kjeldahl Nitrogen	0.5	as N mg/L	<0.5			4	10	105	90	110	80	75	125	
Total Nitrogen - QCBatchID: SKA0138-APR22														
Total Kjeldahl Nitrogen	0.5	as N mg/L	<0.5			ND	10	105	90	110	105	75	125	

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Project : 191-06761-02-100-1002,
Gunn's Hill Landfill Site - GW

06-May-2022

WSP Canada Inc.
Attn : Albert Siertsema

55 King Street, Suite 700, St. Catharines
Canada, L2R 3H5
Phone: 905-687-1771 x 240, Fax:

Date Rec. : 12 April 2022
LR Report: **CA40214-APR22**
Reference: 191-06761-02-100-1002,
Albert Siertsema

Copy: 1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: RL	6: GH-P1
Sample Date & Time						11-Apr-22 12:45
Temp Upon Receipt [°C]	***	***	***	***	***	***
pH [No unit]	13-Apr-22	13:16	13-Apr-22	15:44	0.05	8.04
Conductivity [uS/cm]	13-Apr-22	13:16	13-Apr-22	15:44	2	462
Alkalinity [mg/L as CaCO3]	13-Apr-22	13:16	13-Apr-22	15:44	2	254
DOC [mg/L]	27-Apr-22	14:27	06-May-22	10:02		1.0
Cl [mg/L]	16-Apr-22	12:51	19-Apr-22	15:20	1	2
SO4 [mg/L]	20-Apr-22	07:07	26-Apr-22	16:57	2	16
NO2 [as N mg/L]	14-Apr-22	20:21	19-Apr-22	14:44	0.03	< 0.03
NO3 [as N mg/L]	14-Apr-22	20:21	19-Apr-22	14:44	0.06	< 0.06
4AAP-Phenolics [mg/L]	18-Apr-22	10:37	19-Apr-22	11:02	0.002	< 0.002
Total P [mg/L]	27-Apr-22	14:23	28-Apr-22	11:14	0.03	< 0.03
Hg (diss) [mg/L]	18-Apr-22	08:03	18-Apr-22	11:30	1e-005	< 0.00001
Ca (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:18	0.01	61.9
Mg (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:18	0.001	22.9
Na (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:18	0.01	15.0
K (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:18	0.009	1.07
Hardness [mg/L as CaCO3]	18-Apr-22	21:30	19-Apr-22	10:18		249
As (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:18		0.0054
Ba (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:18		0.131
B (diss) [mg/L]	18-Apr-22	21:30	25-Apr-22	11:44		0.052
Cd (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:18		0.000003
Cr (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:18		0.00022
Cu (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:18		0.0017
Fe (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:18		1.43
Pb (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:18		< 0.00009
Mn (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:18		0.0268

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Project : 191-06761-02-100-1002, Gunn's Hill Landfill Site - GW
LR Report : CA40214-APR22

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: RL	6: GH-P1
Zn (diss) [mg/L]	18-Apr-22	21:30	19-Apr-22	10:18		0.007
TDS [mg/L]	13-Apr-22	08:58	18-Apr-22	13:16	30	223
COD [mg/L]	14-Apr-22	08:00	18-Apr-22	12:55	8	< 8
TKN [as N mg/L]	13-Apr-22	16:05	14-Apr-22	11:17	0.5	< 0.5
NH3+NH4 [as N mg/L]	13 Apr 22	20:45	14-Apr-22	10:58	0.1	0.3
Benzene [ug/L]	20-Apr-22	18:22	26-Apr-22	13:55		< 0.5
1,4-Dichlorobenzene [µg/L]	20-Apr-22	18:22	26-Apr-22	13:55		< 0.5
Dichloromethane [µg/L]	20-Apr-22	18:22	26-Apr-22	13:55		< 0.5
Toluene [ug/L]	20-Apr-22	18:22	26-Apr-22	13:55		< 0.5
Vinyl Chloride [µg/L]	20-Apr-22	18:22	26-Apr-22	13:55		< 0.2

Analysis	7: GH-P2	8: GH-P3A	9: GH-P3B	10: GH-GWDUP	11: Trip Blank
Sample Date & Time	11-Apr-22 14:30	11-Apr-22 13:20	11-Apr-22 13:45	11-Apr-22	11-Apr-22
Temp Upon Receipt [°C]	***	***	***	***	***
pH [No unit]	8.00	8.04	8.01	8.11	---
Conductivity [uS/cm]	493	517	525	462	---
Alkalinity [mg/L as CaCO3]	267	244	246	250	---
DOC [mg/L]	< 1.0	< 1.0	1.3	1.0	---
Cl [mg/L]	4	8	8	3	---
SO4 [mg/L]	18	54	54	11	---
NO2 [as N mg/L]	< 0.03	< 0.03	< 0.03	< 0.03	---
NO3 [as N mg/L]	< 0.06	< 0.06	0.56	< 0.06	---
4AAP-Phenolics [mg/L]	< 0.002	< 0.002	< 0.002	< 0.002	---
Total P [mg/L]	< 0.03	< 0.03	< 0.03	< 0.03	---
Hg (diss) [mg/L]	< 0.00001	< 0.00001	< 0.00001	< 0.00001	---
Ca (diss) [mg/L]	65.4	78.9	74.8	61.3	---
Mg (diss) [mg/L]	24.0	24.3	23.5	22.0	---
Na (diss) [mg/L]	15.2	4.04	3.83	15.3	---
K (diss) [mg/L]	1.20	1.02	0.968	1.07	---
Hardness [mg/L as CaCO3]	262	297	284	244	---
As (diss) [mg/L]	0.0004	0.0028	0.0046	0.0058	---
Ba (diss) [mg/L]	0.179	0.186	0.194	0.136	---
B (diss) [mg/L]	0.050	0.009	0.019	0.062	---
Cd (diss) [mg/L]	< 0.000003	0.000003	< 0.000003	0.000003	---
Cr (diss) [mg/L]	0.00009	0.00024	0.00010	0.00014	---
Cu (diss) [mg/L]	0.0019	0.0029	0.0012	0.0006	---
Fe (diss) [mg/L]	1.10	1.00	1.05	1.38	---
Pb (diss) [mg/L]	< 0.00009	< 0.00009	< 0.00009	< 0.00009	---
Mn (diss) [mg/L]	0.0223	0.0527	0.0341	0.0269	---

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LR Report : CA40214-APR22

Analysis	7: GH-P2	8: GH-P3A	9: GH-P3B	10: GH-GWDUP	11: Trip Blank
Zn (diss) [mg/L]	< 0.002	0.018	0.026	0.006	---
TDS [mg/L]	260	337	303	234	---
COD [mg/L]	< 8	< 8	8	9	---
TKN [as N mg/L]	< 0.5	< 0.5	< 0.5	< 0.5	---
NH3+NH4 [as N mg/L]	0.2	< 0.1	< 0.1	0.2	---
Benzene [ug/L]	< 0.5	< 0.5	< 0.5	---	< 0.5
1,4-Dichlorobenzene [µg/L]	< 0.5	< 0.5	< 0.5	---	< 0.5
Dichloromethane [µg/L]	< 0.5	< 0.5	< 0.5	---	< 0.5
Toluene [ug/L]	< 0.5	< 0.5	< 0.5	---	< 0.5
Vinyl Chloride [µg/L]	< 0.2	< 0.2	< 0.2	---	< 0.2

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Method Descriptions

Parameter	Description	SGS Method Code
1,4-Dichlorobenzene	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
4AAP-Phenolics	phenol by Skalar -solution	ME-CA-[ENV]SFA-LAK-AN-006
Alkalinity	Alkalinity by Titration	ME-CA-[ENV]EWL-LAK-AN-006
Ammonia+Ammonium (N)	NH3+NH4 by Skalar - solution	ME-CA-[ENV]SFA-LAK-AN-007
Arsenic (dissolved)	As by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Barium (dissolved)	Ba by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Benzene	VOC wtr - BTEX	ME-CA-[ENV]GC-LAK-AN-004
Boron (dissolved)	B by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Cadmium (dissolved)	Cd by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Calcium (dissolved)	Ca by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Chemical Oxygen Demand	Chemical Oxygen Demand	ME-CA-[ENV]EWL-LAK-AN-009
Chloride	Chloride by discrete colourmetric analysis	ME-CA-[ENV]EWL-LAK-AN-026
Chromium (dissolved)	Cr by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Conductivity	Conductivity by Conductivity Meter	ME-CA-[ENV]EWL-LAK-AN-006
Copper (dissolved)	Cu by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Dichloromethane	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
Dissolved Organic Carbon	DOC by Combustion/Oxidation	ME-CA-[ENV]EWL-LAK-AN-023
Hardness (dissolved)	Hardness (CaCO3) by ICP-MS dissolved	ME-CA-[ENV]SPE-LAK-AN-006
Iron (dissolved)	Fe by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Lead (dissolved)	Pb by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Magnesium (dissolved)	Mg by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Manganese (dissolved)	Mn by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Mercury (dissolved)	Hg solutions by CVAAS	ME-CA-[ENV]SPE-LAK-AN-004
Nitrate (as N)	Nitrate by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
Nitrite (as N)	Nitrite by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
pH	pH - solution	ME-CA-[ENV]EWL-LAK-AN-006
Phosphorus (total)	Total Phos. By Skalar - complete digestion	ME-CA-[ENV]SFA-LAK-AN-003
Potassium (dissolved)	K by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006

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Parameter	Description	SGS Method Code
Sodium (dissolved)	Na by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Sulphate	Sulphate by discrete colourmetric analysis	ME-CA-[ENV]EWL-LAK-AN-026
Toluene	VOC wtr - BTEX	ME-CA-[ENV]GC-LAK-AN-004
Total Dissolved Solids	Total Dissolved Solids by Gravimetric	ME-CA-[ENV]EWL-LAK-AN-005
Total Kjeldahl Nitrogen	Tot. kjeldahl Nitrogen by Skalar	ME-CA-[ENV]SFA-LAK-AN-002
Vinyl Chloride	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
Zinc (dissolved)	Zn by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006

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Project : 191-06761-02-100-1002, Gunn's Hill Landfill Site - GW
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Quality Control Report

Organic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Volatile Organics - QCBatchID: GCM0339-APR22														
1,4-Dichlorobenzene	0.5	ug/L	<0.5			ND	30	91	60	130	93	50	140	
Benzene	0.5	ug/L	<0.5			ND	30	90	60	130	94	50	140	
Dichloromethane	0.5	ug/L	<0.5			ND	30	89	60	130	88	50	140	
Toluene	0.5	ug/L	<0.5			ND	30	90	60	130	92	50	140	
Vinyl Chloride	0.2	ug/L	<0.2			ND	30	90	50	140	92	50	140	

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Alkalinity - QCBatchID: EWL0248-APR22														
Alkalinity	2	mg/L as Ca	< 2			2	20	102	80	120	NA			
Ammonia by SFA - QCBatchID: SKA0125-APR22														
Ammonia+Ammonium (N)	0.1	as N mg/L	<0.1			0	10	96	90	110	98	75	125	
Anions by discrete analyzer - QCBatchID: DIO5048-APR22														
Chloride	1	mg/L	<1			2	20	106	80	120	112	75	125	
Anions by discrete analyzer - QCBatchID: DIO5057-APR22														
Chloride	1	mg/L	<1			0	20	111	80	120	114	75	125	
Anions by discrete analyzer - QCBatchID: DIO5063-APR22														
Sulphate	2	mg/L	<2			ND	20	110	80	120	123	75	125	
Anions by discrete analyzer - QCBatchID: DIO5077-APR22														
Sulphate	2	mg/L	<2			1	20	102	80	120	93	75	125	
Anions by IC - QCBatchID: DIO0263-APR22														
Nitrate (as N)	0.06	mg/L	<0.06			0	20	99	90	110	97	75	125	
Nitrite (as N)	0.03	mg/L	<0.03			ND	20	98	90	110	99	75	125	
Anions by IC - QCBatchID: DIO0269-APR22														
Nitrate (as N)	0.06	mg/L	<0.06			0	20	98	90	110	116	75	125	
Nitrite (as N)	0.03	mg/L	<0.03			ND	20	100	90	110	124	75	125	
Chemical Oxygen Demand - QCBatchID: EWL0268-APR22														
Chemical Oxygen Demand	8	mg/L	<8			0	20	108	80	120	97	75	125	
Chemical Oxygen Demand - QCBatchID: EWL0269-APR22														
Chemical Oxygen Demand	8	mg/L	<8			ND	20	118	80	120	110	75	125	
Conductivity - QCBatchID: EWL0248-APR22														
Conductivity	2	uS/cm	< 2			0	20	98	90	110	NA			
Mercury by CVAAS - QCBatchID: EHG0031-APR22														

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Project : 191-06761-02-100-1002, Gunn's Hill Landfill Site - GW
LR Report : CA40214-APR22

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Mercury (dissolved)	0.00001	mg/L	< 0.00001			ND	20	117	80	120	97	70	130	
Metals in aqueous samples - ICP-MS - QCBatchID: EMS0121-APR22														
Arsenic (dissolved)	0.0002	mg/L	<0.0002			6	20	101	90	110	111	70	130	
Barium (dissolved)	0.00002	mg/L	<0.00002			0	20	100	90	110	95	70	130	
Boron (dissolved)	0.002	mg/L	<0.002			1	20	94	90	110	94	70	130	
Cadmium (dissolved)	0.000003	mg/L	<0.000003			ND	20	105	90	110	87	70	130	
Calcium (dissolved)	0.01	mg/L	<0.01			3	20	100	90	110	81	70	130	
Chromium (dissolved)	0.00008	mg/L	<0.00008			10	20	101	90	110	79	70	130	
Copper (dissolved)	0.0002	mg/L	<0.0002			1	20	103	90	110	101	70	130	
Iron (dissolved)	0.007	mg/L	<0.007			0	20	102	90	110	125	70	130	
Lead (dissolved)	0.00009	mg/L	<0.00001			2	20	96	90	110	78	70	130	
Magnesium (dissolved)	0.001	mg/L	<0.001			2	20	99	90	110	97	70	130	
Manganese (dissolved)	0.00001	mg/L	<0.00001			0	20	103	90	110	103	70	130	
Potassium (dissolved)	0.009	mg/L	<0.009			2	20	99	90	110	102	70	130	
Sodium (dissolved)	0.01	mg/L	<0.01			5	20	100	90	110	100	70	130	
Zinc (dissolved)	0.002	mg/L	<0.002			12	20	103	90	110	104	70	130	
Metals in aqueous samples - ICP-MS - QCBatchID: EMS0185-APR22														
Boron (dissolved)	0.002	mg/L	<0.002			5	20	93	90	110	99	70	130	
pH - QCBatchID: EWL0248-APR22														
pH	0.05	No unit	NA			NV		100			NA			
Phenols by SFA - QCBatchID: SKA0165-APR22														
4AAP-Phenolics	0.002	mg/L	<0.002			ND	10	97	80	120	NV	75	125	
Phosphorus by SFA - QCBatchID: SKA0282-APR22														
Phosphorus (total)	0.03	mg/L	<0.03			4	10	100	90	110	100	75	125	
Solids Analysis - QCBatchID: EWL0241-APR22														
Total Dissolved Solids	30	mg/L	<30			6	20	101	80	120	NA			
Total Nitrogen - QCBatchID: SKA0124-APR22														
Total Kjeldahl Nitrogen	0.5	as N mg/L	<0.5			4	10	105	90	110	80	75	125	

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Project : 191-06761-02-100-1002, Blandford-Blenheim Landfill Site GW

17-November-2022

WSP Canada Inc.
Attn : Albert Siertsema

55 King Street, Suite 700
St. Catharines, ON
L2R 3H5, Canada

Phone: 905-687-1771 x 240
Fax:

Date Rec. : 20 October 2022
LR Report: **CA40152-OCT22**
Reference: 191-06761-02-100-1002, Albert Siertsema

Copy: 1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: BB-MW1	6: BB-MW2
Sample Date & Time					18-Oct-22 11:43	18-Oct-22 13:10
Temp Upon Receipt [°C]	***	***	***	***	***	***
BOD5 [mg/L]	20-Oct-22	17:08	25-Oct-22	13:33	---	---
TSS [mg/L]	21-Oct-22	14:28	24-Oct-22	16:13	---	---
TDS [mg/L]	20-Oct-22	08:48	21-Oct-22	17:05	574	394
pH [No unit]	20-Oct-22	09:28	24-Oct-22	15:02	8.16	8.09
Conductivity [uS/cm]	20-Oct-22	09:28	24-Oct-22	15:02	1080	627
Alkalinity [mg/L as CaCO3]	20-Oct-22	09:28	24-Oct-22	15:02	498	231
COD [mg/L]	25-Oct-22	06:16	27-Oct-22	12:01	23	< 8
Cl [mg/L]	13-Nov-22	17:43	17-Nov-22	14:56	79	37
SO4 [mg/L]	13-Nov-22	17:43	17-Nov-22	14:56	24	82
NO2 [as N mg/L]	24-Oct-22	07:00	31-Oct-22	13:55	< 0.03	0.11
NO3 [as N mg/L]	24-Oct-22	07:00	31-Oct-22	13:55	< 0.06	0.45
NO2+NO3 [as N mg/L]	24-Oct-22	07:00	31-Oct-22	13:55	< 0.06	0.55
DOC [mg/L]	25-Oct-22	20:25	26-Oct-22	13:19	8	3
TKN [as N mg/L]	24-Oct-22	17:45	25-Oct-22	14:48	16.2	< 0.5
NH3+NH4 [as N mg/L]	25-Oct-22	18:34	26-Oct-22	14:01	15.2	0.1
Total P [mg/L]	21-Oct-22	12:31	27-Oct-22	08:27	0.26	< 0.03
4AAP-Phenolics [mg/L]	20-Oct-22	08:08	24-Oct-22	09:46	0.002	< 0.002
Hg (diss) [mg/L]	21-Oct-22	08:39	21-Oct-22	12:30	< 0.00001	< 0.00001
Ca (diss) [mg/L]	26-Oct-22	12:00	03-Nov-22	12:51	101	73.6
Mg (diss) [mg/L]	26-Oct-22	12:00	03-Nov-22	12:51	37.4	23.8
Na (diss) [mg/L]	26-Oct-22	12:00	03-Nov-22	12:51	29.0	3.85
K (diss) [mg/L]	26-Oct-22	12:00	03-Nov-22	12:51	9.69	1.16
As (diss) [mg/L]	26-Oct-22	12:00	28-Oct-22	17:03	0.0003	0.0007
Ba (diss) [mg/L]	26-Oct-22	12:00	28-Oct-22	17:03	0.358	0.0613
B (diss) [mg/L]	26-Oct-22	12:00	28-Oct-22	17:03	0.103	0.007

OnLine LIMS

0003124785

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Project : 191-06761-02-100-1002, Blandford-Blenheim Landfill Site GW
LR Report : CA40152-OCT22

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: BB-MW1	6: BB-MW2
Cd (diss) [mg/L]	26-Oct-22	12:00	28-Oct-22	17:03	< 0.000003	< 0.000003
Cr (diss) [mg/L]	26-Oct-22	12:00	28-Oct-22	17:03	0.00044	0.00013
Cu (diss) [mg/L]	26-Oct-22	12:00	28-Oct-22	17:03	< 0.0002	< 0.0002
Fe (diss) [mg/L]	26-Oct-22	12:00	28-Oct-22	17:03	3.28	0.095
Pb (diss) [mg/L]	26-Oct-22	12:00	28-Oct-22	17:03	< 0.00009	< 0.00009
Mn (diss) [mg/L]	26-Oct-22	12:00	28-Oct-22	17:03	0.0636	0.0190
Zn (diss) [mg/L]	26-Oct-22	12:00	28-Oct-22	17:03	< 0.002	< 0.002
Benzene [ug/L]	21-Oct-22	11:30	07-Nov-22	15:46	< 0.5	< 0.5
1,4-Dichlorobenzene [µg/L]	21-Oct-22	11:30	07-Nov-22	15:46	< 0.5	< 0.5
Dichloromethane [µg/L]	21-Oct-22	11:30	07-Nov-22	15:46	< 0.5	< 0.5
Toluene [ug/L]	21-Oct-22	11:30	07-Nov-22	15:46	< 0.5	< 0.5
Vinyl Chloride [µg/L]	21-Oct-22	11:30	07-Nov-22	15:46	< 0.2	< 0.2

Analysis	7: BB-MW3	8: BB-BH1-1	9: BB-BH1-2	10: BB-GW DUP	11: Trip Blank
Sample Date & Time	18-Oct-22 12:30	18-Oct-22 14:00	18-Oct-22 14:15	18-Oct-22	18-Oct-22
Temp Upon Receipt [°C]	***	***	***	***	***
BOD5 [mg/L]	---	< 4	28	---	---
TSS [mg/L]	---	238	1590	---	---
TDS [mg/L]	206	---	---	546	---
pH [No unit]	8.16	---	---	8.16	---
Conductivity [uS/cm]	372	---	---	1100	---
Alkalinity [mg/L as CaCO3]	202	---	---	491	---
COD [mg/L]	< 8	---	---	23	---
Cl [mg/L]	0.9	---	---	76	---
SO4 [mg/L]	3.5	---	---	25	---
NO2 [as N mg/L]	< 0.03	---	---	< 0.03	---
NO3 [as N mg/L]	0.32	---	---	< 0.06	---
NO2+NO3 [as N mg/L]	0.32	---	---	< 0.06	---
DOC [mg/L]	< 1	---	---	8	---
TKN [as N mg/L]	< 0.5	---	---	16.4	---
NH3+NH4 [as N mg/L]	< 0.1	---	---	15.3	---
Total P [mg/L]	0.06	---	---	0.30	---
4AAP-Phenolics [mg/L]	< 0.002	---	---	0.003	---
Hg (diss) [mg/L]	< 0.00001	---	---	< 0.00001	---
Ca (diss) [mg/L]	52.3	---	---	95.6	---
Mg (diss) [mg/L]	8.97	---	---	35.4	---
Na (diss) [mg/L]	4.50	---	---	27.9	---
K (diss) [mg/L]	0.652	---	---	9.25	---
As (diss) [mg/L]	0.0003	---	---	0.0002	---

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Project : 191-06761-02-100-1002, Blandford-Blenheim Landfill Site GW
LR Report : CA40152-OCT22

Analysis	7: BB-MW3	8: BB-BH1-1	9: BB-BH1-2	10: BB-GW DUP	11: Trip Blank
Ba (diss) [mg/L]	0.00835	---	---	0.380	---
B (diss) [mg/L]	0.005	---	---	0.108	---
Cd (diss) [mg/L]	0.000010	---	---	0.000003	---
Cr (diss) [mg/L]	0.00037	---	---	0.00040	---
Cu (diss) [mg/L]	0.0006	---	---	< 0.0002	---
Fe (diss) [mg/L]	< 0.007	---	---	3.12	---
Pb (diss) [mg/L]	< 0.00009	---	---	< 0.00009	---
Mn (diss) [mg/L]	0.00041	---	---	0.0602	---
Zn (diss) [mg/L]	< 0.002	---	---	< 0.002	---
Benzene [ug/L]	< 0.5	< 0.5	---	---	< 0.5
1,4-Dichlorobenzene [µg/L]	< 0.5	< 0.5	---	---	< 0.5
Dichloromethane [µg/L]	< 0.5	< 0.5	---	---	< 0.5
Toluene [ug/L]	< 0.5	< 0.5	---	---	< 0.5
Vinyl Chloride [µg/L]	< 0.2	< 0.2	---	---	< 0.2

Temperature of Sample upon Receipt: 4 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: N/A

Method Descriptions

Units	Description	SGS Method Code
ug/L	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
mg/L	phenol by Skalar -solution	ME-CA-[ENV]SFA-LAK-AN-006
mg/L as CaCO3	Alkalinity by Titration	ME-CA-[ENV]EWL-LAK-AN-006
as N mg/L	NH3+NH4 by Skalar - solution	ME-CA-[ENV]SFA-LAK-AN-007
mg/L	As by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Ba by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
ug/L	VOC wtr - BTEX	ME-CA-[ENV]GC-LAK-AN-004
mg/L	Biochemical Oxygen Demand (BOD5)	ME-CA-[ENV]EWL-LAK-AN-007
mg/L	B by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Cd by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Ca by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Chemical Oxygen Demand	ME-CA-[ENV]EWL-LAK-AN-009
mg/L	Chloride by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
mg/L	Cr by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
uS/cm	Conductivity by Conductivity Meter	ME-CA-[ENV]EWL-LAK-AN-006
mg/L	Cu by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
ug/L	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
mg/L	DOC by Skalar	ME-CA-[ENV]SFA-LAK-AN-009
mg/L	Fe by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Pb by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Mg by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Mn by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Hg solutions by CVAAS	ME-CA-[ENV]SPE-LAK-AN-004
mg/L	Nitrate by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
mg/L	Total Nitrate/Nitrite by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
mg/L	Nitrite by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
No unit	pH - solution	ME-CA-[ENV]EWL-LAK-AN-006
mg/L	Total Phos. By Skalar - complete digestion	ME-CA-[ENV]SFA-LAK-AN-003
mg/L	K by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
mg/L	Na by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006

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Project : 191-06761-02-100-1002, Blandford-Blenheim Landfill Site GW
LR Report : CA40152-OCT22

Units	Description	SGS Method Code
mg/L	Sulphate by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
ug/L	VOC wtr - BTEX	ME-CA-[ENV]GC-LAK-AN-004
mg/L	Total Dissolved Solids by Gravimetric	ME-CA-[ENV]EWL-LAK-AN-005
as N mg/L	Tot. kjeldahl Nitrogen by Skalar	ME-CA-[ENV]SFA-LAK-AN-002
mg/L	Total Suspended Solids	ME-CA-[ENV]EWL-LAK-AN-004
ug/L	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
mg/L	Zn by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006

Maarit Wolfe, Hon.B.Sc
Project Specialist,
Environment, Health & Safety

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Project : 191-06761-02-100-1002, Blandford-Blenheim Landfill Site GW
LR Report : CA40152-OCT22

Quality Control Report

Organic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Volatile Organics - QCBatchID: GCM0294-OCT22														
1,4-Dichlorobenzene	0.5	ug/L	<0.5			ND	30	98	60	130	98	50	140	
Benzene	0.5	ug/L	<0.5			ND	30	102	60	130	100	50	140	
Dichloromethane	0.5	ug/L	<0.5			ND	30	98	60	130	99	50	140	
Toluene	0.5	ug/L	<0.5			ND	30	103	60	130	100	50	140	
Vinyl Chloride	0.2	ug/L	<0.2			ND	30	110	50	140	108	50	140	
Volatile Organics - QCBatchID: GCM0392-OCT22														
1,4-Dichlorobenzene	0.5	ug/L	<0.5			ND	30	98	60	130	97	50	140	
Benzene	0.5	ug/L	<0.5			ND	30	100	60	130	101	50	140	
Dichloromethane	0.5	ug/L	<0.5			ND	30	95	60	130	103	50	140	
Toluene	0.5	ug/L	<0.5			ND	30	98	60	130	101	50	140	
Vinyl Chloride	0.2	ug/L	<0.2			ND	30	107	50	140	113	50	140	

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Alkalinity - QCBatchID: EWL0464-OCT22														
Alkalinity	2	mg/L as Ca	< 2			2	20	104	80	120	NA			
Ammonia by SFA - QCBatchID: SKA0249-OCT22														
Ammonia+Ammonium (N)	0.1	as N mg/L	<0.1			ND	10	100	90	110	94	75	125	
Ammonia by SFA - QCBatchID: SKA0262-OCT22														
Ammonia+Ammonium (N)	0.1	as N mg/L	<0.1			0	10	102	90	110	83	75	125	
Anions by IC - QCBatchID: DIO0310-NOV22														
Chloride	0.2	mg/L	<0.2			ND	20	99	90	110	107	75	125	
Sulphate	0.2	mg/L	<0.2			2	20	96	90	110	98	75	125	
Anions by IC - QCBatchID: DIO0393-NOV22														
Chloride	0.2	mg/L	<0.2			ND	20	97	90	110	98	75	125	
Sulphate	0.2	mg/L	<0.2			1	20	92	90	110	88	75	125	
Anions by IC - QCBatchID: DIO0468-OCT22														
Nitrate (as N)	0.06	mg/L	<0.06			ND	20	98	90	110	99	75	125	
Nitrate + Nitrite (as N)	0.06	mg/L	<0.06			NA		NA			NA			
Nitrite (as N)	0.03	mg/L	<0.03			ND	20	98	90	110	102	75	125	
Biochemical Oxygen Demand - QCBatchID: BOD0043-OCT22														
Biochemical Oxygen Demand (BOD5)	2	mg/L	< 2			10	30	96	70	130	NV	70	130	
Carbon by SFA - QCBatchID: SKA0260-OCT22														

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Project : 191-06761-02-100-1002, Blandford-Blenheim Landfill Site GW
LR Report : CA40152-OCT22

Inorganic Analysis															
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank				Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)			Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High			Low	High	
Dissolved Organic Carbon	1	mg/L	<1			2	20	103	90	110		104	75	125	
Chemical Oxygen Demand - QCBatchID: EWL0557-OCT22															
Chemical Oxygen Demand	8	mg/L	<8			ND	20	96	80	120		95	75	125	
Chemical Oxygen Demand - QCBatchID: EWL0558-OCT22															
Chemical Oxygen Demand	8	mg/L	<8			2	20	96	80	120		102	75	125	
Conductivity - QCBatchID: EWL0464-OCT22															
Conductivity	2	uS/cm	< 2			0	20	98	90	110		NA			
Mercury by CVAAS - QCBatchID: EHG0038-OCT22															
Mercury (dissolved)	0.00001	mg/L	< 0.00001			ND	20	90	80	120		NV	70	130	
Metals in aqueous samples - ICP-MS - QCBatchID: EMS0177-OCT22															
Arsenic (dissolved)	0.0002	mg/L	<0.0002			1	20	100	90	110		100	70	130	
Barium (dissolved)	0.00008	mg/L	<0.00002			1	20	102	90	110		103	70	130	
Boron (dissolved)	0.002	mg/L	<0.002			14	20	91	90	110		82	70	130	
Cadmium (dissolved)	0.000003	mg/L	<0.000003			20	20	99	90	110		125	70	130	
Calcium (dissolved)	0.01	mg/L	<0.01			2	20	96	90	110		94	70	130	
Chromium (dissolved)	0.00008	mg/L	<0.00008			6	20	100	90	110		109	70	130	
Copper (dissolved)	0.0002	mg/L	<0.0002			1	20	98	90	110		113	70	130	
Iron (dissolved)	0.007	mg/L	<0.007			11	20	99	90	110		108	70	130	
Lead (dissolved)	0.00009	mg/L	<0.00001			6	20	101	90	110		109	70	130	
Magnesium (dissolved)	0.001	mg/L	<0.001			1	20	97	90	110		91	70	130	
Manganese (dissolved)	0.00001	mg/L	<0.00001			1	20	98	90	110		106	70	130	
Potassium (dissolved)	0.009	mg/L	<0.009			2	20	98	90	110		89	70	130	
Sodium (dissolved)	0.01	mg/L	<0.01			2	20	95	90	110		92	70	130	
Zinc (dissolved)	0.002	mg/L	<0.002			3	20	97	90	110		108	70	130	
pH - QCBatchID: EWL0464-OCT22															
pH	0.05	No unit	NA			0		100				NA			
Phenols by SFA - QCBatchID: SKA0214-OCT22															
4AAP-Phenolics	0.002	mg/L	<0.002			9	10	101	80	120		99	75	125	
Phenols by SFA - QCBatchID: SKA0233-OCT22															
4AAP-Phenolics	0.002	mg/L	<0.002			ND	10	107	80	120		124	75	125	
Phosphorus by SFA - QCBatchID: SKA0232-OCT22															
Phosphorus (total)	0.03	mg/L	<0.03			ND	10	101	90	110		97	75	125	
Phosphorus by SFA - QCBatchID: SKA0266-OCT22															
Phosphorus (total)	0.03	mg/L	<0.03			1	10	101	90	110		92	75	125	
Solids Analysis - QCBatchID: EWL0461-OCT22															
Total Dissolved Solids	30	mg/L	<30			4	20	97	80	120		NA			
Suspended Solids - QCBatchID: EWL0517-OCT22															
Total Suspended Solids	2	mg/L	< 2			5	10	105	90	110		NA			
Total Nitrogen - QCBatchID: SKA0250-OCT22															

OnLine LIMS

0003124785

SGS Canada Inc.
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Project : 191-06761-02-100-1002, Blandford-Blenheim Landfill Site GW
LR Report : CA40152-OCT22

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
							%		Low	High		Low	High
Total Kjeldahl Nitrogen	0.5	as N mg/L	<0.5			5	10	100	90	110	102	75	125

OnLine LIMS

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Project : 191-06761-02-100-1002, Blandford-Blenheim LF Site GW

05-December-2022

WSP Canada Inc.
Attn : Albert Siertsema

55 King Street, Suite 700
St. Catharines, ON
L2R 3H5, Canada

Phone: 905-687-1771 x 240
Fax:

Date Rec. : 28 November 2022
LR Report: **CA40332-NOV22**
Reference: 191-06761-02-100-1002, Albert Siertsema

Copy: 1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	3: Analysis Completed Date	5: RL	6: BB-BH1-1	7: BB-BH1-2	8: Trip Blank
Sample Date & Time				25-Nov-22 10:00	25-Nov-22 10:30	25-Nov-22
Temp Upon Receipt [°C]	***	***	***	***	***	***
BOD5 [mg/L]	29-Nov-22	05-Dec-22	2	22	8	---
pH [No unit]	29-Nov-22	30-Nov-22	0.05	7.72	7.20	---
Conductivity [uS/cm]	29-Nov-22	30-Nov-22	2	687	2100	---
Alkalinity [mg/L as CaCO3]	29-Nov-22	30-Nov-22	2	334	1070	---
TDS [mg/L]	29-Nov-22	01-Dec-22	30	369	820	---
COD [mg/L]	29-Nov-22	05-Dec-22	8	20	131	---
DOC [mg/L]	29-Nov-22	01-Dec-22	1.0	1.8	30.5	---
Cl [mg/L]	01-Dec-22	04-Dec-22	1	15	37	---
SO4 [mg/L]	01-Dec-22	05-Dec-22	2	4	<20	---
NO2 [as N mg/L]	30-Nov-22	05-Dec-22	0.03	0.07	< 0.3	---
NO3 [as N mg/L]	30-Nov-22	05-Dec-22	0.06	0.56	< 0.06	---
NO2+NO3 [as N mg/L]	30-Nov-22	05-Dec-22	0.06	0.62	<0.3	---
NH3+NH4 [as N mg/L]	29-Nov-22	02-Dec-22	0.1	1.8	100	---
TKN [as N mg/L]	29-Nov-22	01-Dec-22	0.5	2.0	99.2	---
TSS [mg/L]	29-Nov-22	30-Nov-22	2	89	238	---
4AAP-Phenolics [mg/L]	30-Nov-22	30-Nov-22	0.002	0.003	0.016	---
Total P [mg/L]	29-Nov-22	01-Dec-22	0.03	0.16	0.58	---
Hg (diss) [mg/L]	30-Nov-22	01-Dec-22	1e-005	< 0.00001	< 0.00001	---
Ca (diss) [mg/L]	01-Dec-22	02-Dec-22	0.01	111	195	---
Mg (diss) [mg/L]	01-Dec-22	02-Dec-22	0.001	18.4	40.7	---
Na (diss) [mg/L]	01-Dec-22	02-Dec-22	0.01	3.90	31.9	---
K (diss) [mg/L]	01-Dec-22	02-Dec-22	0.009	4.56	60.7	---
As (diss) [mg/L]	01-Dec-22	02-Dec-22	0.0002	0.0004	0.0016	---
Ba (diss) [mg/L]	01-Dec-22	02-Dec-22	2e-005	0.0561	0.278	---
B (diss) [mg/L]	01-Dec-22	02-Dec-22	---	0.063	0.750	---

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Project : 191-06761-02-100-1002, Blandford-Blenheim LF Site GW
LR Report : CA40332-NOV22

Analysis	1: Analysis Start Date	3: Analysis Completed Date	5: RL	6: BB-BH1-1	7: BB-BH1-2	8: Trip Blank
Cd (diss) [mg/L]	01-Dec-22	02-Dec-22	0.0001	0.000004	0.000010	---
Cr (diss) [mg/L]	01-Dec-22	02-Dec-22	0.003	0.00019	0.00377	---
Cu (diss) [mg/L]	01-Dec-22	02-Dec-22	0.001	0.0010	0.0008	---
Fe (diss) [mg/L]	01-Dec-22	02-Dec-22	---	0.08	73.5	---
Pb (diss) [mg/L]	01-Dec-22	02-Dec-22	1e-005	< 0.001	< 0.001	---
Mn (diss) [mg/L]	01-Dec-22	02-Dec-22	---	0.852	0.548	---
Zn (diss) [mg/L]	01-Dec-22	02-Dec-22	0.002	0.011	0.007	---
Benzene [mg/L]	01-Dec-22	02-Dec-22	0.5	< 0.0005	0.0057	< 0.0005
1,4-Dichlorobenzene [mg/L]	01-Dec-22	02-Dec-22	0.5	< 0.0005	0.0032	< 0.0005
Dichloromethane [mg/L]	01-Dec-22	02-Dec-22	0.5	< 0.0005	< 0.0005	< 0.0005
Toluene [mg/L]	01-Dec-22	02-Dec-22	0.5	< 0.0005	0.0012	< 0.0005
Vinyl Chloride [mg/L]	01-Dec-22	02-Dec-22	0.2	< 0.0002	< 0.0002	< 0.0002

Temperature of Sample upon Receipt: 4 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

SO4 for sample 7 RL increased due to sample matrix

Method Descriptions

Parameter	Description	SGS Method Code
1,4-Dichlorobenzene	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
4AAP-Phenolics	phenol by Skalar -solution	ME-CA-[ENV]SFA-LAK-AN-006
Alkalinity	Alkalinity by Titration	ME-CA-[ENV]EWL-LAK-AN-006
Ammonia+Ammonium (N)	NH3+NH4 by Skalar - solution	ME-CA-[ENV]SFA-LAK-AN-007
Arsenic (dissolved)	As by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Barium (dissolved)	Ba by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Benzene	VOC wtr - BTEX	ME-CA-[ENV]GC-LAK-AN-004
Biochemical Oxygen Demand (BOD5)	Biochemical Oxygen Demand (BOD5)	ME-CA-[ENV]EWL-LAK-AN-007
Boron (dissolved)	B by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Cadmium (dissolved)	Cd by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Calcium (dissolved)	Ca by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Chemical Oxygen Demand	Chemical Oxygen Demand	ME-CA-[ENV]EWL-LAK-AN-009
Chloride	Chloride by discrete colourmetric analysis	ME-CA-[ENV]EWL-LAK-AN-026
Chromium (dissolved)	Cr by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Conductivity	Conductivity by Conductivity Meter	ME-CA-[ENV]EWL-LAK-AN-006
Copper (dissolved)	Cu by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Dichloromethane	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
Dissolved Organic Carbon	DOC by Combustion/Oxidation	ME-CA-[ENV]EWL-LAK-AN-023
Iron (dissolved)	Fe by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Lead (dissolved)	Pb by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Magnesium (dissolved)	Mg by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Manganese (dissolved)	Mn by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Mercury (dissolved)	Hg solutions by CVAAS	ME-CA-[ENV]SPE-LAK-AN-004
Nitrate (as N)	Nitrate by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001

OnLine LIMS

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Project : 191-06761-02-100-1002, Blandford-Blenheim LF Site GW
LR Report : CA40332-NOV22

Parameter	Description	SGS Method Code
Nitrate + Nitrite (as N)	Total Nitrate/Nitrite by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
Nitrite (as N)	Nitrite by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
pH	pH - solution	ME-CA-[ENV]EWL-LAK-AN-006
Phosphorus (total)	Total Phos. By Skalar - complete digestion	ME-CA-[ENV]SFA-LAK-AN-003
Potassium (dissolved)	K by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Sodium (dissolved)	Na by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006
Sulphate	Sulphate by discrete colourmetric analysis	ME-CA-[ENV]EWL-LAK-AN-026
Toluene	VOC wtr - BTEX	ME-CA-[ENV]GC-LAK-AN-004
Total Dissolved Solids	Total Dissolved Solids by Gravimetric	ME-CA-[ENV]EWL-LAK-AN-005
Total Kjeldahl Nitrogen	Tot. kjeldahl Nitrogen by Skalar	ME-CA-[ENV]SFA-LAK-AN-002
Total Suspended Solids	Total Suspended Solids	ME-CA-[ENV]EWL-LAK-AN-004
Vinyl Chloride	VOC wtr	ME-CA-[ENV]GC-LAK-AN-004
Zinc (dissolved)	Zn by ICP-MS solution (dissolved)	ME-CA-[ENV]SPE-LAK-AN-006

Jill Campbell

Jill Campbell, B.Sc.,GISAS
Project Specialist,
Environment, Health & Safety

OnLine LIMS

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Quality Control Report

Organic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Volatile Organics - QCBatchID: GCM0006-DEC22														
1,4-Dichlorobenzene	0.0005	mg/L	<0.0005			ND	30	84	60	130	101	50	140	
Benzene	0.0005	mg/L	<0.0005			ND	30	83	60	130	102	50	140	
Dichloromethane	0.0005	mg/L	<0.0005			ND	30	83	60	130	99	50	140	
Toluene	0.0005	mg/L	<0.0005			ND	30	83	60	130	104	50	140	
Vinyl Chloride	0.0002	mg/L	<0.0002			ND	30	74	50	140	94	50	140	

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Alkalinity - QCBatchID: EWL0646-NOV22														
Alkalinity	2	mg/L as Ca	< 2			3	20	100	80	120	NA			
Ammonia by SFA - QCBatchID: SKA0012-DEC22														
Ammonia+Ammonium (N)	0.1	as N mg/L	<0.1			0	10	106	90	110	95	75	125	
Ammonia by SFA - QCBatchID: SKA0293-NOV22														
Ammonia+Ammonium (N)	0.1	as N mg/L	<0.1			6	10	104	90	110	97	75	125	
Anions by discrete analyzer - QCBatchID: DIO5003-DEC22														
Chloride	1	mg/L	<1			ND	20	107	80	120	114	75	125	
Sulphate	2	mg/L	<2			ND	20	104	80	120	110	75	125	
Anions by discrete analyzer - QCBatchID: DIO5006-DEC22														
Sulphate	2	mg/L	<2			1	20	104	80	120	102	75	125	
Anions by IC - QCBatchID: DIO0727-NOV22														
Nitrate (as N)	0.06	mg/L	<0.06			0	20	98	90	110	99	75	125	
Nitrate + Nitrite (as N)	0.06	mg/L	<0.06			NA		NA			NA			
Nitrite (as N)	0.03	mg/L	<0.03			2	20	94	90	110	96	75	125	
Anions by IC - QCBatchID: DIO0760-NOV22														
Nitrite (as N)	0.03	mg/L	<0.03			ND	20	97	90	110	94	75	125	
Biochemical Oxygen Demand - QCBatchID: BOD0051-NOV22														
Biochemical Oxygen Demand (BOD5)	2	mg/L	< 2			6	30	106	70	130	NV	70	130	
Carbon by Combustion/Oxidation - QCBatchID: EWL0656-NOV22														
Dissolved Organic Carbon	1.0	mg/L	<1.0			ND	20	100	90	110	93	75	125	
Chemical Oxygen Demand - QCBatchID: EWL0638-NOV22														
Chemical Oxygen Demand	8	mg/L	<8			5	20	104	80	120	103	75	125	
Conductivity - QCBatchID: EWL0646-NOV22														
Conductivity	2	uS/cm	< 2			0	20	100	90	110	NA			

OnLine LIMS

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Project : 191-06761-02-100-1002, Blandford-Blenheim LF Site GW
LR Report : CA40332-NOV22

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
							%		Low	High		Low	High
Mercury by CVAAS - QCBatchID: EHG0068-NOV22													
Mercury (dissolved)	0.00001	mg/L	< 0.00001			15	20	108	80	120	120	70	130
Metals in aqueous samples - ICP-MS - QCBatchID: EMS0183-NOV22													
Arsenic (dissolved)	0.0002	mg/L	<0.0002			7	20	103	90	110	100	70	130
Barium (dissolved)	0.00008	mg/L	<0.00002			4	20	98	90	110	99	70	130
Boron (dissolved)	0.002	mg/L	<0.002			7	20	109	90	110	101	70	130
Cadmium (dissolved)	0.000003	mg/L	<0.000003			ND	20	105	90	110	106	70	130
Calcium (dissolved)	0.01	mg/L	<0.01			10	20	97	90	110	97	70	130
Chromium (dissolved)	0.00008	mg/L	<0.00008			10	20	103	90	110	101	70	130
Copper (dissolved)	0.0002	mg/L	<0.0002			8	20	104	90	110	97	70	130
Iron (dissolved)	0.01	mg/L	<0.007			11	20	96	90	110	NV	70	130
Lead (dissolved)	0.001	mg/L	<0.00001			ND	20	101	90	110	103	70	130
Magnesium (dissolved)	0.001	mg/L	<0.001			6	20	95	90	110	98	70	130
Manganese (dissolved)	0.002	mg/L	<0.00001			8	20	107	90	110	103	70	130
Potassium (dissolved)	0.009	mg/L	<0.009			9	20	95	90	110	94	70	130
Sodium (dissolved)	0.01	mg/L	<0.01			7	20	91	90	110	98	70	130
Zinc (dissolved)	0.002	mg/L	<0.002			10	20	103	90	110	103	70	130
pH - QCBatchID: EWL0646-NOV22													
pH	0.05	No unit	NA			2		100			NA		
Phenols by SFA - QCBatchID: SKA0296-NOV22													
4AAP-Phenolics	0.002	mg/L	<0.002			ND	10	94	80	120	85	75	125
Phosphorus by SFA - QCBatchID: SKA0003-DEC22													
Phosphorus (total)	0.03	mg/L	<0.03			3	10	107	90	110	94	75	125
Solids Analysis - QCBatchID: EWL0636-NOV22													
Total Dissolved Solids	30	mg/L	<30			0	20	100	80	120	NA		
Suspended Solids - QCBatchID: EWL0639-NOV22													
Total Suspended Solids	2	mg/L	< 2			0	10	102	90	110	NA		
Total Nitrogen - QCBatchID: SKA0005-DEC22													
Total Kjeldahl Nitrogen	0.5	as N mg/L	<0.5			2	10	101	90	110	102	75	125
Total Nitrogen - QCBatchID: SKA0291-NOV22													
Total Kjeldahl Nitrogen	0.5	as N mg/L	<0.5			ND	10	107	90	110	92	75	125

OnLine LIMS

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