



# FINAL 2025 Annual Monitoring Report

Hibbert Landfill  
Township of Hibbert, Ontario

Prepared for:

## Corporation of the Municipality of West Perth

160 Wellington Street, P.P. Box 609  
Mitchell, ON N0K 1N0

November 27, 2025

Pinchin File: 333568.002

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November 27, 2025

Mr. Adam Ryan and Mr. Richard Wright  
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Re: 2025 Annual Monitoring Report  
Hibbert Landfill  
Pinchin Reference No. 333568.002

Pinchin Ltd. (Pinchin) is pleased to provide this 2025 Annual Monitoring Report for the Hibbert Landfill.

This report provides details of the monitoring program completed in 2025, an interpretation of the 2025 monitoring data, as well as our conclusions and recommendations.

Appended to this report are all the relevant technical data, as well as the Monitoring and Screening Checklist from the Ministry of the Environmental, Conservation and Parks' Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water – Technical Guidance Document (November 2010), which provides certification for the Competent Environmental Practitioner (CEP). The above-noted checklist is provided in Appendix H.

We trust that this report satisfies your requirements. If you have any questions or comments, please contact us.

Yours truly,

Pinchin

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## EXECUTIVE SUMMARY

The Hibbert Landfill (Site) has a licensed area of 1.2 hectares (ha) and is located in the Municipality of West Perth (Municipality) on Lot 22, Concession 9, in the former Township of Hibbert, Ontario. The Site is surrounded by agricultural land and the McMillan Drain (Drain), which flows southwesterly along the western boundary of the Site.

According to information provided in previous reports, the Site operated since 1980 under the Waste Disposal Site Environmental Compliance Approval (ECA) number A151301, issued on March 24, 1980. The ECA was amended on September 18, 2008 (Notice No.1) to incorporate requirements for Site operations and monitoring, and then again on September 20, 2010 (Notice No. 2) (Waste ECA), to acknowledge Site closure and outline the requirements for post closure care and monitoring. Closure of the Site was completed by the Municipality between 2009 and 2012, in accordance with the Ministry of the Environment, Conservation and Parks (MECP) approved Closure Plan.

The monitoring program for the Site has been conducted in accordance with Condition 3.0 of the Waste ECA since 2008. Based on the findings of the 2025 Monitoring Program for the Site, the following conclusions were generated:

- Locally, the shallow groundwater flow is influenced by surficial features such as the Drain, which flows west along the west boundary of the Site. The shallow groundwater elevations measured in 2025 was consistent with historical elevations and the flow pattern demonstrated flow to the west toward the Drain. The deep groundwater flow system is inferred to flow in a southwesterly direction;
- In 2025, the analytical results that were greater than their respective Ontario Drinking Water Standard (ODWS) with the groundwater were generally consistent with historical results, with the exception of alkalinity which appeared to be attributed to an exogenic source or may more likely be anomalous. The concentrations of most parameters in the shallow and deep groundwater monitoring wells have generally fluctuated or been stable with no apparent increasing or decreasing trend since groundwater monitoring began at the Site in 2005;
- The 2025 and historical concentrations of the primary leachate indicator parameter, chloride and boron, have remained in compliance with the respective trigger concentrations for the Site. There have also not been increasing concentration trends of concern at the groundwater compliance monitoring wells that would indicate an impending exceedance of a trigger mechanism for the Site or warrant remedial action at this time;
- Since 2011, the concentration of chloride has slightly increased at MW2D, however, it has remained below the trigger concentration for the Site. It is noted that there have been no distinct increases in concentration of the other indicator parameters within MW2D that

would indicate a distinct landfill leachate influence on groundwater quality. The slightly increasing concentration of chloride is likely attributable to the chemical quality of the soil fill at the Site. No remedial actions are required, at this time, to address the chloride concentration at MW2D;

- Based on a review of the analytical results for the 2025 annual monitoring event, the groundwater quality around the waste footprint at the Site is of acceptable quality. The 2025 analytical results for select parameters (hardness, total dissolved solids (TDS), alkalinity and dissolved organic carbon) were greater than their respective trigger concentrations for groundwater quality at compliance monitoring wells MW2S, MW2D and MW3. However, the 2025 and historical analytical results for the select parameters at these monitoring wells have generally been stable, fluctuating or exhibiting a decreasing trend. The parameters that exceeded their respective trigger concentration were within their historical concentration ranges, with the exception of alkalinity within MW2D. The groundwater quality at these monitoring wells is considered stable and are not interpreted to be degrading as a result of a landfill leachate influence. No remedial actions are required, at this time, to address the analytical results that were greater than their respective trigger concentration. Concentrations of select parameters above the ODWS and respective trigger concentrations should be monitored during subsequent monitoring events to ensure that an increasing trend of concern is not occurring at these locations;
- The concentrations of volatile organic compound (VOC) constituents within the groundwater compliance monitoring wells were below their respective laboratory reportable detection limits (RDLs) for the 2025 monitoring event;
- Surface water flow measurements were collected at both SW1 and SW2 surface water locations on May 6, 2025. Surface water flow was generally consistent with historical measurements;
- The surface water quality at the compliance station (SW2) satisfied the applicable Provincial Water Quality Objectives (PWQO) and the relevant trigger mechanisms and for the Site during the 2025 annual monitoring event. It is noted that chloride concentrations at surface water station SW1 and surface water compliance monitoring station SW2 appear to be slightly increasing since May 2019, with a concentration of chloride at SW2 above its historical upper limit concentration in May 2021, and an overall fluctuating trend since 2022. Monitoring at surface water station SW1 and surface water compliance monitoring station SW2 should continue to ensure that an increasing trend of concern is not occurring at these locations. There is no indication that a landfill leachate influence is occurring on surface water quality at these locations as it relates to chloride and boron concentrations. No remedial action is warranted at this time;

- One water sample was collected from the Dorssers drinking water supply well. The analytical results for total hardness, TDS and fluoride were greater than their respective ODWS during the 2025 monitoring event. It is recommended that the Dorssers drinking water supply well continue to be monitored to establish concentration trends and to ensure no concentration trends of concern are occurring;
- Landfill gas was not detected at any of the leachate and groundwater monitoring wells at the Site for the 2025 annual monitoring event. Based on monitoring findings from the established monitoring network to-date, landfill gas does not appear to be generated within the waste mound or migrating beyond the waste footprint at levels that would represent an explosive risk to nearby structures; and
- There were no deficiencies noted during the 2025 annual Site inspection conducted by Pinchin, with the exception that the fence adjacent to the front gate is cut. It is Pinchin's recommendation that this fencing be repaired. No deficiencies were noted during the monthly inspections conducted by the Municipality that would warrant remedial action.

Based on the findings of the 2025 Monitoring Program, the following recommendations are provided for consideration:

- Monitoring at the Site should be continued in 2026, in accordance with the approved monitoring program as summarized in Table 1. No deviations from the approved monitoring program are recommended;
- The concentration of chloride within compliance monitoring well MW2D should continue to be monitored over subsequent monitoring events to assess the analytical results and evaluate the concentration trend over time. No remedial action is warranted at this time;
- The groundwater quality within monitoring wells MW2S, MW2D and MW3 should continue to be evaluated over subsequent monitoring events to confirm that the parameter concentrations that exceeded their trigger concentration in 2025 are not exhibiting an increasing trend long term. No remedial action is warranted at this time;
- Monitoring at surface water station SW1 and surface water compliance monitoring station SW2 should continue to ensure that an increasing trend of concern for chloride is not occurring at these locations. There is no indication that a landfill leachate influence is occurring on surface water quality at these locations as it relates to chloride and boron concentrations. No remedial action is warranted at this time;
- Sampling of the residential Dorssers supply well should continue during future monitoring efforts to confirm the current conditions as they relate to potential effects from the former waste disposal activities associated with the Site;
- Repair fencing adjacent to the front gate; and



- The 2025 and historical landfill gas monitoring results for the annual monitoring events had not revealed a significant or consistent presence of landfill gas at any of the leachate and groundwater monitoring wells at the Site. Landfill gas should continue to be monitored at the Site only as part of the annual monitoring program to assess for the presence and, if detected, concentrations of landfill gas over time. The winter landfill gas monitoring component should be discontinued.



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## 1.0 INTRODUCTION

### 1.1 Background

Pinchin Ltd. (Pinchin) was retained by the Corporation of the Municipality of West Perth (Client) to prepare the 2025 Annual Monitoring Report for the Hibbert Landfill (Site). The Site is located on Lot 22, Concession 9, in the former Township of Hibbert, Ontario. The Site is owned and was formerly operated by the Municipality of West Perth (Municipality). A Site Location Map and Site Plan are provided in Figure 1 and Figure 2, respectively. The Site has a licensed area of 1.2 hectares (ha) and during operation, accepted solid, non-hazardous municipal waste.

The Site operated since 1980, under the West Disposal Site Environmental Compliance Approval (ECA) Number **A151301**, issued on March 24, 1980. This ECA was amended on September 18, 2008 (Notice No. 1), to incorporate design operations and monitoring requirements. The ECA was amended again on September 20, 2010 (Notice No. 2), to acknowledge the Site closure and outline post closure care and monitoring requirements.

As part of the 2025 Annual Monitoring Report, Pinchin reviewed the following documents:

- 2019-2024 Annual Monitoring Reports, Hibbert Landfill, Township of Hibbert, Ontario prepared by Pinchin for the Corporation of Municipality of West Perth (2019-2024 Pinchin Annual Monitoring Reports);
- “*Municipality of West Perth, Hibbert Landfill, 2018 Annual Monitoring Event Summary*” prepared by RWDI Air Inc. (RWDI) for the Municipality of West Perth and dated July 6, 2019 (2018 RWDI Annual Monitoring Event Summary); and
- “*Municipality of West Perth, Hibbert Landfill, 2017 Annual Monitoring Report*” prepared by RWDI Air Inc. (RWDI) for the Municipality of West Perth and dated December 6, 2017 (2017 RWDI Annual Monitoring Report).

As part of the 2018 RWDI Annual Monitoring Event Summary, RWDI reviewed the results of the 2006 hydrogeological study documented in a Burnside report entitled “*Hydrogeological Investigation, Hibbert Landfill Site*”, dated December 2007 (2007 Burnside Report). According to RWDI, the 2007 Burnside Report recommended that if the Site were to be closed, future monitoring should be incorporated into the closure plan and consideration should be given to installing a leachate monitoring well near the southwest corner of the fill area where burnt waste was identified.

It was noted that, as the Site is relatively small for a landfill and the historical waste deposition rate was very low, the potential impacts from the landfill were found to be minimal and, as a result, the additional leachate monitoring well discussed above was deemed unnecessary. The monitoring program for the Site has been conducted in accordance with Condition 3.0 of the Waste ECA since 2008. Annual monitoring



reports for the 2008 through 2017, and monitoring summary for 2018, were completed for the Site by other consultants in December of each calendar year, as required in the Waste ECA.

## **1.2 Key Personnel**

The Competent Environmental Practitioner (CEP) for the Site groundwater, surface water and methane gas monitoring program was Mr. Tim McBride of Pinchin. Mr. McBride's contact information is provided below:

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The Lead Environmental Technician for the Site groundwater, surface water and methane gas monitoring program was Ms. Deana Bettencourt of Pinchin. Ms. Bettencourt's contact information is provided below:

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## **1.3 Objectives and Scope**

The principal objectives of the 2025 Monitoring Program are as follows.

- To evaluate groundwater and leachate quality at the Site and assess the potential for impacts to nearby water resources, as a result of the former landfill operations and the closed waste deposits;

- To assess the adequacy of the existing monitoring program with respect to evaluating the potential for impacts at nearby water resources;
- To determine whether remedial actions are required in consideration of the findings the monitoring program; and
- To document and report the findings of the monitoring program on an annual basis to the Municipality and provide a report to the MECP on behalf of the Municipality.

The primary aspects of the environmental monitoring program are data collection, analysis, and interpretation. This report documents the data collected as part of the 2025 Monitoring Program and were interpreted in consideration of historical data (2006 through 2024). Groundwater quality analytical results from 2025 were compared to the relevant trigger mechanisms and quality objectives per the MECP Guideline B-7 Reasonable Use Concept (Guideline B-7).

The 2025 Annual Monitoring Report has been prepared to meet the reporting requirements outlined in Condition 3.0 of the Waste ECA. This report has been prepared in consideration of historical reporting frameworks and background technical information to maintain a level of consistency such that historical reports can be easily referenced to this report.

#### **1.4 Assumptions and Limitations**

Pinchin has assumed that the information generated from historical investigations is accurate and has been completed in accordance with standard engineering practices and regulations. It should be noted that the historical background information made available to Pinchin by the Client was limited and, as such, previous reports have been relied on for information where required.

The scope of the monitoring activities was limited to the immediate area surrounding the Site. The investigations were limited solely to the groundwater within the monitoring well installations. The investigation does not constitute an exhaustive investigation of the Site property or adjacent properties for potentially unknown contaminants and/or other unknown sources of environmental impact.

Pinchin's limitation of liability and scope of work is as follows:

- The work performed in this report was carried out in accordance with the Terms and Conditions outlined in the Request for Proposal (RFP) Number RFP 05-2023. The conclusions presented herein are based solely upon the scope of services and time and budgetary limitations described in the RFP and associated Purchase Order;
- This report has been prepared in accordance with generally accepted environmental study and/or engineering practices. No other warranties, either expressed or implied, are made as to the professional services provided under the terms of the contract and included in this report;

- The services performed and outlined in this report were based, in part, upon a previously installed monitoring network, established by others and approved by the applicable regulatory agencies. Pinchin's opinion cannot be extended to portions of the Site which were unavailable for direct observations, reasonably beyond the control of Pinchin;
- The objective of this report was to assess the water quality conditions at the Site, given the context of our contract, with respect to existing environmental regulations within the applicable jurisdiction;
- The Site history interpreted herein relies on information supplied by others, such as local, provincial and federal agencies, as well as Site personnel. No attempt has been made to independently verify the accuracy of such information, unless specifically noted in this report;
- Pinchin's interpretations relating to the landfill-derived leachate plume at the Site are described in this report. Where testing was performed, it was executed in accordance with the contract for these services. It should be noted that other compounds or materials not tested for may be present in the Site environment;
- The conclusions of this report are based, in part, on the information provided by others. The possibility remains that unexpected environmental conditions may be encountered at the Site in locations not specifically investigated. Should such an event occur, Pinchin must be notified in order that we may determine if modifications to these conclusions are necessary;
- The utilization of Pinchin's services during future monitoring at the Site will allow Pinchin to observe compliance with the conclusions and recommendations contained herein. It will also provide for changes as necessary to suit field conditions as they are encountered; and
- Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Pinchin accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

### **1.5 MECP Correspondence**

At the time of writing this report, correspondence and/or MECP review comments regarding the 2025 Annual Monitoring Report had not been received from the MECP. If MECP correspondence is received after this report is issued, any comments, questions or consent can be addressed in that year's relevant Annual Monitoring Report. If more urgent attention is required, comments can be addressed under separate cover prior to issuing the next relevant annual monitoring report.

## **2.0 PHYSICAL SETTING**

### **2.1 Site Description**

The Site is located in the former Township of Hibbert, Ontario, along Country Road 24, north of Road 181. The Site is surrounded by agricultural land to the north, south and east, with the McMillan Drain situated along the western Site boundary, followed by agricultural land. The McMillan Drain flows southwesterly and is indicated on Figure 1.

The fill and subsurface conditions at the Site have been interpreted based on subsurface information obtained from previous annual monitoring reports completed by RWDI. Monitoring well construction details are provided in Table 2, while borehole details are provided in Appendix B-1 and test pit logs are provided in Appendix B-2. The monitoring well locations are indicated in Figure 2.

### **2.2 Geology and Hydrogeology**

Based on available mapping, the surficial topography around the Site is relatively flat with surface elevations typically ranging from approximately 312 m above sea level (masl) in the area northeast of the Site to 310 masl in the area southwest of the Site. The landfill base is constructed below ground surface with the top of the waste deposits elevated above the surrounding ground surface. It was noted in previous annual monitoring reports that the Municipality estimated that the waste extends to a maximum depth of approximately 3.7 m below ground surface (mbgs).

According to the Ministry of Northern Development and Mines, the soil geology in the vicinity of the Site is reported to consist of silt and clay with minor sand and gravel derived from fine-textured glaciolacustrine deposits. In addition, the bedrock geology in the vicinity of the Site is reported to consist of limestone, dolostone and shale, part of the Dundee Formation.

As noted in previous environmental monitoring reports, the overburden in the area of the Site is typically not a local source of drinking water. No major overburden aquifers were identified.

The Source Water Protection Study (SGRA, 2010) mapping demonstrates that the Site does not fall within a significant groundwater recharge or aquifer vulnerability area.

Static water levels were recorded by Pinchin in all of the accessible wells for the 2025 groundwater monitoring event. Water levels were measured prior to purging and developing in preparation for sampling, to ensure the water levels are representative of static conditions. May 2025 groundwater elevations, as measured by Pinchin personnel, are presented in Table 2, and in plan view as inferred groundwater contours as presented in Figure 3.

### **3.0 SUBSURFACE CONDITIONS**

According to previous reports, six (6) test pits were excavated at the Site in 2006 to determine the extent and nature of the waste on the Site. The test pit locations, including details of the subsurface conditions, are presented in Appendix B-2.

Based on previous annual monitoring reports, the test pits were excavated to a maximum depth of 3.2 mbgs. Information from the test pit and borehole logs, as well as historical documentation, was used to characterize the extent and nature of the historical waste disposal practices at the Site.

Review of the previous intrusive investigation reports indicated that the Site operated using the trench and fill method since the late 1960s. The placement of waste at this Site progressed in a southerly direction with older waste at the northeast end of the waste footprint and more recent waste being placed at the southwest end. The report indicated that the maximum depth of waste at the Site is approximately 3.7 mbgs, which represents the maximum depth of the excavation equipment historically used at the Site.

### **4.0 2025 LANDFILL OPERATIONS**

According to available documentation, the Site was formally closed to the receipt of waste by March 17, 2009. Closure of the Site was completed by the Municipality between 2009 and 2012, in accordance with the MECP approved Closure Plan. The Site remains in a closed state and was observed as such during the 2025 groundwater monitoring event, in compliance with the Waste ECA.

#### **4.1 Accepted Waste Types**

The Site historically accepted solid, non-hazardous municipal waste, as defined by the Environmental Protection Act. The Site is now closed and no longer receives waste.

Based on the Site inspections completed in 2025, there was no indication of waste being placed at the Site in 2025. An information sign at the front entrance identifies that the Site is closed, and provides the ECA number, contact information, as well as directions to an alternative waste disposal facility. The Site boundary is fenced with a lockable rigid-frame gate that controls access onto the Site.

Additional findings from the 2025 annual Site inspection are discussed in Section 11 of this report.

#### **4.2 Waste Volume and Remaining Capacity**

Previous annual monitoring reports indicate that at the time of Site closure, the waste-in-place volume was estimated to be approximately 31,660 cubic metres (m<sup>3</sup>). The approved capacity of the Site stated in the Waste ECA is 51,240 m<sup>3</sup>. Subtracting the waste-in-place volume estimate from the theoretical capacity provides a remaining estimated capacity of approximately 19,580 m<sup>3</sup>. It was also reported in the 2017 RWDI Annual Monitoring Report that the Municipality abandoned the remaining unused capacity, due to operational difficulties associated with utilizing the unused capacity, and the Site was formally closed to the receipt of waste by March 17, 2009.

### **4.3 Cover**

According to the historical reports, the Municipality imported soil cover material as it became available beginning in 2009, in preparation for Site closure. The waste fill area was roughly graded in October 2010. To accommodate the higher surface elevations, the top of monitoring well casings were raised by an MECP licensed well contractor, where necessary. Following formal closure of the Site in 2009, a final cover was applied, and grading was conducted in August 2011. Appropriate vegetation was seeded, and the Site is now covered in low-lying vegetation.

The Client should continue to maintain the integrity of the landfill cover as per the ECA. Annual monitoring and inspections should continue to be completed to ensure regular maintenance is occurring on an as needed basis. At the time of the monitoring event, no significant damage or concerns related to the landfill cover were noted.

## **5.0 METHODOLOGY**

The 2025 Monitoring Program at the Site included annual leachate, surface water, groundwater and landfill gas monitoring. The annual monitoring event was completed between May 6 and May 7, 2025. A quality assurance and quality control (QA/QC) program was followed for each of the routine monitoring tasks completed. QA/QC details are presented in Section 6.

The current monitoring program was completed in accordance with the Waste ECA and the Environmental Monitoring Plan (EMP) for the Site, as dated December 2010 and prepared by Burnside, and consisted of procedures for the purging and sampling of leachate and groundwater monitoring wells, as well as landfill gas monitoring. Field data for the annual monitoring event are presented in Table 7.

### **5.1 Monitoring Well Details**

A total of seven (7) monitoring wells are installed at the Site. The monitoring network for the Site is summarized below and presented in Table 1, whereas the locations of the monitoring wells are indicated in Figure 2.

Two (2) monitoring wells, one (1) shallow and one (1) deep, were installed at different depths at locations MW2 and MW5. The shallow well is designated with the postscript "S" (i.e., MW2S) and the deeper well is designated with the postscript "D" (i.e., MW2D). The remaining single wells (MW1, MW3 and MW4) are shallow wells. The following is a summary of the monitoring well locations:

- MW1 is a shallow leachate monitoring well located within the northeast portion of the waste footprint;
- MW2S/D are shallow and deep overburden monitoring wells, respectively, located downgradient of the waste footprint between the west property line and the Drain;

- MW3 is a shallow overburden monitoring well located near the southwest boundary of the Site;
- MW4 is a leachate monitoring well located within the central portion of the waste footprint; and
- MW5S/D are shallow and deep overburden monitoring wells, respectively, located upgradient of the waste footprint along the entrance roadway.

Monitoring well construction details are presented in Table 2 and in the borehole logs provided in Appendix B-1. The Global Positioning System (GPS) coordinates of relevant site features and monitoring locations are presented in Table 8.

## **5.2 Groundwater Level Measurements**

Groundwater levels were manually measured at the Site during the annual monitoring event using an interface probe. The interface probe was cleaned before initial use and between uses to minimize the potential for cross-contamination by washing with an Alconox™/potable water mixture followed by a deionized water rinse.

The groundwater levels were measured at the monitoring wells on May 6, 2025. The groundwater levels collected to date are summarized in Table C-1, Appendix C.

## **5.3 Groundwater and Leachate Sampling**

The 2025 Monitoring Program included the collection of groundwater and leachate samples from each of the seven (7) monitoring wells on May 7, 2025, in accordance with Pinchin's Standard Operation Procedures (SOPs).

All monitoring well development, purging and sampling activities were conducted using dedicated inertial pumps comprised of Waterra™ polyethylene tubing and foot valves to draw groundwater to the surface on May 6 and May 7, 2025.

Prior to monitoring well purging, the static groundwater/liquid level was measured, and the well-casing volume was calculated. The monitoring well was then purged with the dedicated inertial-lift pump until three (3) liquid volumes were removed, or until a discontinuous flow of water was observed.

Sampling was completed after the removal of three (3) well casing volumes, or the following day if discontinuous flow was observed. Following each casing volume removed, field indicator parameters pH, electrical conductivity (EC), and temperature were recorded into a dedicated field book.

Samples collected for metals analysis were filtered in the field using dedicated 0.45-micron in-line filters prior to preservation. Other parameters sampled, were collected directly into bottles provided by the laboratory.

The groundwater and leachate samples were collected directly into bottles provided by the laboratory.

Collected samples were submitted to ALS Environmental Inc. (ALS) in Waterloo, Ontario, a Canadian Association for Laboratory Accreditation (CALA) certified environmental laboratory, under chain of custody documentation, for analysis. Laboratory Certificates of Analysis are provided in Appendix E.

#### **5.4 Surface Water Sampling**

The 2025 Monitoring Program included the collection of surface water samples and surface water flows from surface water monitoring station SW1 located on the Drain on May 6, 2025. As depicted in Figure 2 and 3, the Drain flows southwesterly along the west side of the Site.

The surface water monitoring stations at the Site are summarized below.

- SW1 is located in the Drain upstream (northeast) of the waste footprint; and
- SW2 is located in the Drain downstream (southwest) of the waste footprint.

The surface water samples were collected via a grab sample at the monitoring locations using a clean and unpreserved sample bottle. Grab sample aliquots were then transferred into laboratory-prepared dedicated sample bottles. For each monitoring location, field indicator parameter pH, EC, temperature, dissolved oxygen (DO) and turbidity were recorded into a dedicated field book.

Collected samples were submitted to ALS for analysis. Laboratory Certificates of Analysis are provided in Appendix E.

#### **5.5 Off-Site Water Supply Well Sampling**

The previous monitoring reports indicated that as part of the monitoring completed in 2008, the five (5) residents closest to the Site were surveyed regarding their water supply wells and septic systems. The water supply well closest to the Site (Skinner) was incorporated into the annual monitoring program for the Site and sampled again in 2009.

The Municipality informed Pinchin in May 2022, that both residences close to the Hibbert landfill have been demolished and a new build was slated for the lot to the northwest of the landfill (in the location of the Skinner water supply well); however, this residence had no active discharge point at the time of the 2022 annual monitoring event. As part of the 2023 to 2025 monitoring events, the new build located at the former Skinner location had an active discharge point, and the water supply well was sampled (herein referred to as Dorssers) on May 6, 2025.

#### **5.6 Landfill Gas Monitoring**

Landfill gas (methane) monitoring was completed at the seven (7) monitoring well locations on May 6, 2025. Landfill gas measurements were obtained immediately after removing the monitoring well's push-on cap and prior to collecting liquid level measurements and conducting the sampling procedure. Monitoring was completed using a 4-way gas meter calibrated to detect 100% of the lower explosive limit

(LEL) for methane (CH<sub>4</sub>). For landfill gas measurements calibrated for methane, 100% of the LEL is equivalent to 5% volume of methane in air.

#### 5.6.1 Winter Gas Monitoring

Landfill gas is restricted from venting in the winter when the ground is frozen and there is ice and snow cover present. This may cause landfill gas to migrate more laterally from the waste footprint. Condition 3.3 of the Waste ECA describes a requirement for winter gas monitoring at the Site. Condition 3.3 states:

*“Landfill gas shall be monitored from appropriate gas monitoring probes at the Site, at least three times, during frozen ground conditions (i.e., December 1 through April 30).”*

According to previous annual monitoring reports, winter gas monitoring was first completed for the Site during the 2010/2011 winter season. Two (2) near detection limit levels of methane were detected, which are not interpreted to reflect a persistence of landfill gas at this Site. Based on the results, it was concluded in the 2011 Annual Monitoring Report that winter gas monitoring is not necessary.

In compliance with Condition 3.3 of the Waste ECA (Notice No. 2), two (2) of the three-winter landfill gas monitoring events were completed during the 2023/2024 winter season on February 23, 2024, and March 18, 2024. Pinchin completed a third winter landfill gas monitoring event in December 2024, the results of which are included as part of this 2025 annual monitoring report.

In addition, Pinchin completed three-winter landfill gas monitoring events during the 2024/2025 winter season on January 23, 2025, February 26, 2025, and March 13, 2025.

In each annual monitoring report completed by others since 2011, it has been recommended that winter gas monitoring at the Site be discontinued. As written approval from the MECP has yet to be received regarding the discontinuation of winter gas monitoring at the Site, the monitoring was completed during the 2024/2025 winter season monitoring and will be completed during the 2025/2026 winter season.

## 6.0 QUALITY ASSURANCE AND QUALITY CONTROL EVALUATION

Various quality assurance/quality control (QA/QC) protocols were following during the 2025 annual monitoring event to ensure that representative samples were obtained, and that representative analytical data were reported by the laboratory.

Field QA/QC protocols that were employed by Pinchin included the following:

- Groundwater, surface water and leachate samples were placed in laboratory-supplied glass sample containers;
- The monitoring wells were purged to remove stagnant water prior to sample collection so that representative groundwater and leachate samples could be obtained. Dedicated purging and sampling equipment were used for monitoring well purging and sampling to minimize the potential for cross-contamination;



- Groundwater, surface water and leachate samples were placed in coolers on ice immediately upon collection, with appropriate sample temperatures maintained prior to submission to the laboratory;
- Dedicated and disposable nitrile gloves were used for sample handling;
- Non-dedicated monitoring and sampling equipment (e.g., interface probe) was cleaned before initial use and between uses to minimize the potential for cross-contamination by washing with an Alconox™/potable water mixture followed by a deionized water rinse; and
- Sample collection and handling procedures were performed in general accordance with the Ontario MECP document entitled “*Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*” dated December 1996 (*MECP Sampling Guideline*), the Association of Professional Geoscientists of Ontario document entitled “*Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended)*”, dated April 2011 (*APGO Guideline*) and Pinchin’s standard operating procedures (SOPs).

All field instrumentation calibration checks were completed by Pinchin field staff prior to use on-Site. All field operations conducted by Pinchin field staff members were completed using standard equipment decontamination and sampling procedures, and no deviations from the sampling plan were noted.

ALS’s internal laboratory QA/QC consisted of the analysis of laboratory duplicate, method blank, matrix spike and spiked blank samples, an evaluation of relative percent difference (RPD) calculations for laboratory duplicate samples, and an evaluation of surrogate recoveries.

In addition to the QA/QC measures summarized above, Pinchin obtained a laboratory-prepared trip blank and also collected a total of one (1) field duplicate surface sample, taken from surface water location SW2, for analysis to assess the suitability of field sampling methods and laboratory performance. The field duplicate sample was collected immediately following collection of the regular sample. The frequency of water quality sample analysis complied with the requirement that one duplicate water quality sample is analyzed for every ten regular water quality samples submitted for analysis. The field duplicate pairing and corresponding analytical parameters are summarized as follows:

Media	Sample Date	Original Sample ID	Field-Prepared Duplicate ID
Surface Water	May 6, 2025	SW2	DUP-03

The quality of the analytical results was evaluated by calculating the RPD for the original and field duplicate samples. The RPDs were calculated using the following equation:



$$\text{RPD} = \frac{(\text{Original Concentration} - \text{Duplicate Concentration}) \times 100}{(\text{Original Concentration} + \text{Duplicate Concentration})/2}$$

RPDs were not calculated unless the parameter concentration in both the original and duplicate sample had detectable concentrations above the corresponding practical quantitation limit (PQL) for the parameter, which is equal to five times the lowest laboratory Reporting Detection Limit (RDL).

The calculated RPDs for the original and field duplicate groundwater or surface water samples have been compared to performance standards provided in the MECP document entitled *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality* dated March 9, 2004, and revised on July 1, 2011 (*Analytical Protocol*) and as of February 19, 2021. Pinchin notes that although these performance standards only strictly apply to laboratory duplicate samples, they have been considered suitable for comparison to the field duplicate groundwater or surface water sample results as well. If calculated RPD values are greater than the performance standards, further assessment is required of the apparent lack of precision of the analytical results and the effect, if any, on the interpretation of the analytical results. This assessment may include a review of analytical laboratory quality control, reporting errors, and field sampling methods.

## **6.1 Data Quality Evaluation**

Water quality samples collected by Pinchin were generated in accordance with acceptable procedures. No analytical hold times were exceeded for samples submitted for analyses and sample temperatures upon receipt at the project laboratory were below 10° Celsius, with the exception of the groundwater samples submitted on May 7, 2025. Based on high ambient temperatures during the sampling of the groundwater samples on May 7, 2025, it is likely that these samples were unable to be cooled to below 10° Celsius prior to the same day laboratory submission. It is Pinchin's opinion that analytical data for the groundwater samples are accurate as presented and acceptable for inclusion into the database for interpretive purposes.

RPD values (the absolute difference between two values divided by the average value and expressed as a percent) were calculated between the parent sample and the field duplicate as part of the QA/QC program. RPD results of sample and duplicate analyses that are less than 30 percent indicate an acceptable level of analytical uncertainty. RPD values calculated for measured analyte concentrations for sample and duplicate pairs that exceed 30 percent generally warrant discussion because they may indicate the presence of elevated analytical uncertainty and a potential for making interpretive errors based on the analysis results. Use of calculated RPD values to assess analytical uncertainty when using measured analyte concentrations for sample and sample duplicate pairs is not appropriate when either measured analyte concentration is within a multiple of 5 of the method detection limit (a value designated as the practical quantification limit (PQL)), where analytical uncertainty is typically elevated.



As part of the 2025 annual monitoring event QA/QC evaluation, a QA/QC evaluation was completed for the analytical results of the original sample (SW2) and its respective duplicate sample (DUP-03) collected at surface water monitoring station SW2. The results of the sample and duplicate analyses satisfied the criteria of the QA/QC evaluations.

No VOCs were detected in the submitted trip blank.

## 7.0 TRIGGER MECHANISMS

The trigger mechanisms for groundwater and surface water quality provide a guidance tool for the evaluation of waste fill area effects, where relevant, on groundwater and surface water at and adjacent to the Site. Findings from the 2025 annual monitoring event were assessed against the relevant trigger mechanisms established for the Site.

### 7.1 Groundwater Trigger Mechanisms

The calculation of trigger concentrations for the groundwater monitoring wells at the Site is based on the MECP Guideline B-7 Reasonable Use Concept (Guideline B-7). The Guideline B-7 criteria (trigger concentrations) for the background monitoring wells are calculated based on the geometric mean of the historical analytical concentrations to the end of the previous reporting year. For the purpose of this report, the geometric mean of the historical analytical concentration extends from 2010 to the end of 2024. The trigger concentrations are calculated for analytical parameters which are identified in the Waste ECA and EMP for analysis at the groundwater monitoring wells and have an existing ODWS criterion. The parameters where the trigger concentrations have been calculated are presented in Table 4 (shallow wells) and Table 5 (deep wells).

The groundwater compliance monitoring wells for the Site have been identified as those that are located along, or outside of, the Site property boundary, including: MW2S/D and MW3 (shallow). For each relevant parameter, the analytical results from the 2025 monitoring event for the compliance monitoring wells were compared to the calculated trigger concentrations for the background monitoring wells. The background monitoring wells for the Site are MW5S for the shallow flow system and MW5D for the deep flow system.

The locations of the groundwater monitoring wells at the Site are presented in the following summary table.

Monitoring Well	Position Relative to Waste Fill Area	Property Boundary Monitoring Well	Trigger Compliance Monitoring Well
Shallow Wells			
MW1	Leachate	No	No

Monitoring Well	Position Relative to Waste Fill Area	Property Boundary Monitoring Well	Trigger Compliance Monitoring Well
MW2S	Downgradient/Adjacent	Yes	Yes
MW3	Crossgradient/Adjacent	Yes	Yes
MW4	Leachate	No	No
MW5S	Upgradient	Yes	Background
Deep Wells			
MW2D	Downgradient/Adjacent	Yes	Yes
MW5D	Upgradient	Yes	Background

**Notes:** 1) Position relative to waste fill area is based on the interpreted groundwater flow direction as determined by contouring the May 2025 static water levels.

Consistent with previous annual monitoring and reporting programs, the trigger mechanism is activated if one of the following conditions are met:

- If the analytical result for chloride from the most recent monitoring event is greater than the respective trigger concentration at a groundwater compliance monitoring well. It is noted that, as a measure of conservatism, the trigger concentration for chloride within the groundwater compliance wells is 75% of the calculated Guideline B-7 criterion for chloride.
- If the analytical results for at least three (3) parameters, other than chloride, from the most recent monitoring event are greater than their respective trigger concentration at a compliance monitoring well.

#### 7.1.1 Guideline B-7 Reasonable Use Concept

Guideline B-7, the “reasonable use concept” (RUC) approach, is the MECP’s groundwater management strategy for mitigating the effect of contamination on properties adjacent to its source. It establishes procedures for determining the reasonable use of groundwater on a property adjacent to sources of contaminants and establishes limits on the discharge of contaminants from facilities which dispose of waste into the shallow subsurface.

The application of “reasonable use” is outlined in Procedure B-7-1 “*Determination of Contaminant Limits and Attenuation Zones*”. The procedure determines the maximum concentration ( $C_m$ ) of a particular contaminant that would be acceptable in the groundwater beneath an adjacent property and is calculated in accordance with the relationship:

$$C_m = C_b + x (C_r - C_b)$$

$C_b$  – This is the background concentration of the particular groundwater contaminant in consideration before it has been affected by human activities. From this it is possible to calculate the extent of human activities impact on contaminant levels.

$C_r$  – The maximum concentration of a particular contaminant that should be present in the groundwater. This value is dependent on property's use of the groundwater as outlined in B-7. It also allows for the total amount of contamination. Pinchin conservatively assumes that the reasonable use of the groundwater on-Site is potentially for potable drinking purposes.

$x$  – As determined by the MECP, this constant determines the extent which the contamination has on the groundwater's use. For drinking water  $x$  is 0.5 for non-health related parameters or 0.25 for health-related parameters. For other reasonable uses it is 0.5.

Per Guideline B-7, a landfill cannot degrade the water quality on an adjacent property by more than 50% of the difference between background water quality and the water quality required for use of that property for non-health related parameters, and 25% for health-related parameters, as outlined in the ODWS. The Guideline B-7 criteria consider the geometric mean distribution of historical background monitoring well groundwater analytical results. As a result, the calculations are updated annually to include newly obtained data from the ongoing groundwater monitoring and analytical testing.

An example calculation of the 2025 trigger concentration for chloride using the Guideline B-7 formula and available analytical data to 2025 is presented below.

#### **Chloride in the Shallow Flow System:**

Guideline B-7 formula:  $C_m = C_b + X \times (C_r - C_b)$  where:

- $C_b$  = Background concentration (in this case, a geometric mean concentration to 2024).
  - Number of analytical testing data ( $n$ ) in background monitoring wells BH5S = 15 (2010-2024).
  - Geometric mean concentration value ( $C_b$ ) = 13.6 mg/L.
- $C_r$  = Maximum allowable concentration of a parameter in groundwater (ODWS criterion).
  - ODWS criterion for chloride ( $C_r$ ) = 250 mg/L.
  - $X$  = Reduction constant associated with assessing whether a parameter of concern is non-health related (0.5) or is health related (0.25).

Based on the above definitions, for chloride in the shallow flow system we have the following values:

- $C_b$  = 13.6 mg/L
- $C_r$  = 250 mg/L

- $X = 0.50$

Thus,  $C_m = 13.6 + 0.50 \times (250 - 13.6)$

= 132 mg/L in the Shallow Flow System

To evaluate the shallow groundwater quality in 2025 would require the use of 132 mg/L for the parameter chloride; however, the trigger concentration for chloride within the groundwater compliance wells is 75% of the calculated Guideline B-7 criterion for chloride as an added measure of conservatism. Therefore, the maximum allowable concentration of chloride at a downgradient boundary of the Site would be approximately 75% of 132 mg/L or approximately 99 mg/L in the monitoring wells for the shallow flow system. The trigger concentrations are calculated separately for the shallow and deep compliance monitoring wells to assess the shallow and deep groundwater quality, respectively. The trigger concentrations for the relevant analytical parameters are tabulated in Table 4 and 5.

## 7.2 Surface Water Trigger Mechanisms

Condition 3.0 and 4.0 of the Waste ECA indicate that for the surface water monitoring stations, the surface water quality at the Site is to be monitored to confirm compliance with the relevant PWQO. However, a trigger mechanism for surface water is not identified in the ECA or EMP for the Site. The 2017 RWDI Annual Monitoring Report indicated that the Site has a similar potential groundwater discharge to surface water setting as the Mitchell Domestic Landfill, located within the Municipality, and thus, the surface water trigger mechanism established for the Mitchell Domestic Landfill has been adopted herein to assess acceptable surface water quality at the Site for the purposes of this annual report.

Based on the surface water trigger mechanism established for the Mitchell Domestic Landfill, the trigger mechanism for the surface water monitoring at the Site involves the comparison of the surface water analytical results from the most recent monitoring event to their respective Provincial Water Quality Objectives (PWQO), where available. Trigger concentrations are established for analytical parameters through the following:

- i) Identified in the Waste ECA and EMP for analysis at the surface water monitoring stations, and
- ii) Have an existing PWQO. As there is no PWQO for chloride, the Guideline B-7 criterion calculated for chloride in the shallow groundwater system is used as an indicator of landfill impacts in surface water.

The surface water compliance station for the Site is SW2. This surface water location is positioned downstream of the Site in the Drain, which flows southwesterly along the west side of the Site.

The trigger mechanism for surface water at the Site is activated if one of the following conditions is met.

- If the analytical result for chloride from the most recent monitoring event is greater than the respective shallow groundwater Guideline B-7 criterion (99 mg/L) at the compliance station; or
- If the analytical results for at least three (3) parameters, other than chloride, from the most recent monitoring event are greater than their respective PWQO at the compliance station.

The trigger concentrations for the surface water parameters are presented in Table 6.

### **7.3 The Ontario Drinking Water Standards (ODWS)**

Through the establishment of the ODWS, the province of Ontario has determined legally enforceable standards on contaminants in drinking water. The standards are designed to protect public health by restricting the quality of specific contaminants in drinking water. Three categories of contaminants are regulated under the Ontario Regulation 169/03 Drinking Water Standards:

- Microbiological – Originating from human and animals waste, coliforms and bacteria are common in the environment. Most are harmless however their presence may be indicative of other harmful bacteria in the water. Under the ODWS, Escherichia coli (“E. Coli”), fecal coliforms and total coliforms must be non-detectable in drinking water;
- Chemical – ODWS regulates maximum quantities of organic and inorganic chemicals allowed in drinking water. Industrial discharges or agricultural runoff are not necessarily removed by drinking water treatment. Consuming water exhibiting a greater concentration of these chemicals than the ODWS may cause serious health problems; and
- Radiation – Natural and artificial radio nuclides are also regulated in the ODWS. Standards are expressed as maximum allowable concentrations in becquerels per litre (“L”). Radiological contaminants include radio nuclides, such as radium 228, which are caused from the erosion of naturally occurring deposits, or artificial radio nuclides, such as tritium, released into the water by nuclear power plants. Radiological contaminants do not naturally occur on the Site or surrounding properties and the disposal of radiological waste was not suspected on the Site and as a result radiation was not monitored.

The ODWS Guideline Document is the MECP technical guidance document which provides guidance on applicability of the ODWS and also provides applicable interim guidelines where legal standards are absent. Both the ODWS and Guideline B-7 were used in assessing the groundwater results obtained during the 2025 Monitoring Program.

#### **7.4 Primary Indicator Parameters**

As indicated in the previous reports, to provide focus for the presentation of trigger parameter data, chloride and boron are considered to be primary leachate indicator parameters for the assessment of the groundwater quality as it relates to the evaluation of a trigger mechanism exceedance for the Site. The use of the primary leachate indicator parameters to evaluate possible leachate effects on groundwater quality is beneficial as they represent a larger group of parameters (i.e., boron for metals and chloride for anions).

The parameter chloride has been observed to be notably greater in the leachate compared to groundwater. The elevated concentrations of chloride typically originate from anthropogenic sources, such as road salt or landfill leachate. The natural overburden groundwater quality in the area of the Site generally has low chloride concentrations (i.e., less than 10 mg/L). The EMP details that greater chloride concentrations are present in the shallow background groundwater at monitoring well MW5S, with a historical upper limit concentration of 48.9 mg/L (2010), than typically within natural overburden groundwater. However, the concentration of chloride at MW5S has quantified an overall decreasing trend since 2010, with the exception of May 2024 sampling event, by which the concentration was 27 mg/L and the highest concentration reported for MW5S since May 2011. It is Pinchin's opinion that the elevated concentration measured in May 2024, could be attributed to a general increase in yearly precipitation causing additional salt runoff from nearby roads. Pinchin will continue to monitor the chloride concentration within monitoring well MW5S to confirm that no increasing concentration trends of concern are occurring.

As chloride is very mobile, it is therefore justifiably utilized as a primary leachate indicator. Boron is also very mobile in groundwater and is representative of a larger group of parameters (i.e., other metal constituents) and therefore, is also justifiably utilized as a primary leachate indicator.

The remaining trigger parameters are considered to be secondary leachate indicator parameters and are presented in Tables 4 and 5.

### **8.0 GROUNDWATER ELEVATION RESULTS**

Groundwater levels have been monitored in the leachate and groundwater monitoring wells at the Site since May 2006 by previous consultants. Monitoring well locations are indicated in Figure 2 and monitoring well construction details are provided in Table 2. The 2025 groundwater level data are tabulated in Table C-1, Appendix C, along with the historical data.

#### **8.1 Leachate Elevation**

Leachate level measurements have been taken in the leachate monitoring wells, MW1 and MW4, at the Site since 2006. Hydrographs of the leachate elevation at MW1 and MW4 are presented in Figure C-1,

Appendix C. The leachate elevations at MW1 and MW4 have generally fluctuated over time with no distinctive trends of increasing or decreasing levels.

The leachate elevations measured in 2025 were consistent with historical elevations. It is also noted that leachate seeps were not observed at the Site during routine inspections in 2025.

## **8.2 Shallow Groundwater Flow**

The shallow groundwater elevations measured for the 2025 annual monitoring event were generally consistent with historical elevations. Liquid level elevations in the shallow groundwater monitoring wells at the Site have generally fluctuated over time with no long-term trends of increasing or decreasing levels. These fluctuating trends are likely a result of periods of prolonged precipitation or lower than normal precipitation prior to the monitoring events.

Locally, the shallow groundwater flow regime is influenced by surficial features such as the Drain, which flows southwesterly along the west boundary of the Site. Due to the close proximity of the Site to the Drain, the liquid levels at the Site are also likely to be influenced by fluctuating surface water levels in the Drain.

In 2025, the groundwater flow pattern in the shallow monitoring wells demonstrates flow to the west toward the Drain. Contour mapping of the shallow groundwater elevations and the interpreted groundwater flow direction in the vicinity of the Site is indicated in Figure 3.

## **8.3 Deep Groundwater Flow**

Each of the monitoring wells at the Site are positioned in the overburden with the deep groundwater monitoring wells at the Site (MW2D and MW5D) and screened approximately 4.5 m deeper in the overburden than the respective shallow groundwater monitoring wells at the Site.

The deep groundwater elevations measured for the 2025 annual monitoring event were consistent with historical elevations. Groundwater level elevations in the deep groundwater monitoring wells at the Site have generally fluctuated over time with no distinctive trends of increasing or decreasing levels.

The deep groundwater flow system in the overburden is inferred to be a reflection of groundwater movement in the bedrock aquifer and flow southwesterly. Although there is an insufficient number of deep groundwater monitoring wells at the Site to accurately contour the groundwater flow in the deeper overburden, the groundwater elevations between MW2D and MW5D support the flow of groundwater in a southwesterly direction.

## **9.0 SURFACE WATER FLOW**

The 2025 Monitoring Program included the collection of surface water flows from the two (2) surface water monitoring locations. Estimated surface water flow collected for the Site since 2006 are presented in Table 3.

In 2025, the surface water flow estimates at monitoring stations SW1 and SW2 indicated a gain of flow in the Drain as it passed alongside the Site. A surface water flow measurement was collected on May 6, 2025, at both SW1 and SW2 locations. The May 6, 2025, estimated surface water flows were generally consistent relative to historical flow measurements.

During the 2025 surface water monitoring event, no water was observed discharging from the culvert or the tile drain. According to previous monitoring efforts, no other tile drain outlets are known to be present between the two surface water stations. As such, where gains were observed in surface water flow between SW1 and SW2, it is likely a result of precipitation and/or groundwater contribution.

## **10.0 GROUNDWATER QUALITY RESULTS**

The 2025 groundwater quality analytical results are presented in Tables D-1 to D-4, Appendix D. Historical (2006 to 2024) analytical results are also included for comparison. Laboratory Certificates of Analysis are provided in Appendix E.

### **10.1 Leachate**

Leachate monitoring wells MW1 and MW4 are situated within the waste footprint and, therefore, the liquid quality at these locations is inferred to represent leachate (i.e., source strength) at the Site. The analytical results for MW1 and MW4 are presented in Table D-1 and Table D-2, Appendix D.

#### *10.1.1 General Chemistry*

As quantified in Table D-1, with few exceptions, the 2025 parameter concentrations at MW1 and MW4 were generally consistent with historical results. The fluctuating parameter concentrations are reasonable for municipal solid waste leachate in southern Ontario.

Overall, the leachate at MW1 and MW4 is mildly alkaline with pH levels of 7.47 and 7.91, respectively. The leachate quality from the landfill waste at the Site, as determined from samples obtained from MW1 and MW4, is generally characterized by elevated concentrations of most general parameters, major ions, organic parameters, and select metals relative to background groundwater quality. Specifically, the concentrations of total dissolved solids (TDS), chloride, dissolved organic carbon (DOC), barium, boron, iron and manganese have typically been greater in the leachate at the Site relative to background groundwater concentrations.

It is noted that alkalinity, ammonia, fluoride, orthophosphate and aluminum within MW1 and nitrite (as nitrogen) within MW4, were detected above their historical upper limit concentrations. With the exception of alkalinity, these concentrations met the applicable ODWS standards. Pinchin notes that elevated levels of alkalinity were detected in several of the monitoring wells above their historical upper concentration limit including MW2D, MW3 and background monitoring well MW5S. Since elevated levels of alkalinity were reported at background monitoring well MW5S, it is Pinchin's opinion that the source of this

alkalinity is likely from an exogenic source such as high precipitation levels and will need to be confirmed during the next regularly scheduled monitoring event (in duplicate at MW3).

Overall, where the parameter concentrations are greater within the leachate at the Site relative to the background concentrations, the concentrations are relatively low when compared to some of the other waste disposal sites in the Municipality.

#### *10.1.2 Chloride and Sodium Concentrations*

Based on a review of the historic database, the chloride and sodium concentrations within the leachate at MW1 and MW4 increased significantly in 2011. Prior to 2011, the concentration of most constituent concentrations at MW1 and MW4 were generally stable with no distinctive increasing or decreasing trends.

To-date, the chloride at MW1 was greatest in 2013 and sodium was greatest in 2016. The chloride and sodium concentration at MW4 were also greatest in 2013 and 2016, respectively. Since 2013, chloride has been exhibiting a generally decreasing trend, and sodium has been exhibiting a generally fluctuating and slightly decreasing trend. The 2025 and historical analytical results for MW1 and MW4 are presented in Table D-1, Appendix D.

Available previous annual monitoring reports indicate that the Municipality revealed that one of the sources of the cover soil placed at the Site was excess soil removed from the reconstruction of Highway 8 from Dublin to St. Columbian, west of Mitchell. Given that the most significant change in leachate quality was for chloride and sodium, it was determined that residual road salt was present in the soil, causing increased concentrations of these parameters in the leachate monitoring wells.

Previous annual monitoring reports also indicated that in 2011, additional soil samples were collected from the base of the soil fill unit (while remaining above the leachate table) and submitted for analysis of sodium, chloride and sodium absorption ratio (SAR) to get a better understanding of the waste/soil quality before infiltration reaches the leachate table. According to the 2017 RWDI Annual Monitoring Report, the soil sample result confirmed that elevated salt related concentrations (chloride and sodium) present in the leachate were from the soil fill.

#### *10.1.3 Volatile Organic Compounds*

The analytical results for VOCs are presented in Table D-2, Appendix D. For the 2025 annual monitoring event, concentrations of VOC constituents within leachate wells MW1 and MW4 were generally below their respective RDLs, with the exception of chlorobenzene, n-hexane and xylene in MW4.

The detection of chlorobenzene and xylene at MW4 were below their respective ODWS. Based upon a review of historical data, chlorobenzene and xylene have historically been detected intermittently within the leachate at MW4. The detected concentration of n-hexane at MW4 was the first detection of this parameter since monitoring began. It is noted that there is no ODWS for n-hexane and the detection was

marginally above the applicable RDL. Based on the low levels of VOC parameters detected and the fact that these VOCs parameters have not been detected above the ODWS (where applicable) in MW4, no remedial actions are required to address VOCs concentrations within MW4 at this time.

## **10.2 Groundwater**

Based on the measured groundwater level elevations and the inferred groundwater flow pattern in the shallow flow system, the groundwater at monitoring well MW5S is interpreted to represent background groundwater quality conditions in the shallow flow system. Monitoring well MW5D represents background groundwater quality conditions within the deep flow system. The remaining shallow and deep monitoring wells, with the exception of leachate monitoring wells MW1 and MW4, represent either crossgradient or downgradient groundwater conditions at the Site. The analytical results for the groundwater wells are presented in Table D-3 and Table D-4, Appendix D.

### *10.2.1 General Chemistry*

A summary of the 2025 groundwater results compared to the trigger concentrations for the compliance monitoring wells is presented in Section 10.2.3.

Concentration versus time plots for the primary indicator parameters (chloride and boron) for the groundwater compliance monitoring well are presented in Figures D-1 and D-2 (shallow monitoring wells) and Figures D-3 and D-4 (deep monitoring wells), Appendix D.

The ODWS for the parameters analyzed are provided for comparison in Tables D-1 to Tables D-5, Appendix D. The primary purpose of the ODWS is to provide information for the protection of public health through the provision of safe drinking water and particularly to serve as a reference for the design and operation of water treatment plants to produce water that is safe for consumption.

The groundwater at the Site is not used as drinking water, however, the analytical results are still compared to the relevant ODWS. Although there are established trigger mechanisms in place, where an analytical result is greater than its respective trigger concentration, the ODWS can be used secondary to the trigger mechanisms to evaluate potential leachate influences on groundwater quality. The analytical results that were greater than their respective ODWS in 2025 were generally consistent with historical results. For each monitoring well, the relevant results that were greater than their respective ODWS are presented in Table D-3, Appendix D.

As indicated in Figure D-1, the concentration of chloride within the shallow groundwater compliance monitoring wells has remained in compliance with the respective trigger concentration for the Site. Generally, the concentration of chloride has fluctuated with an overall decreasing trend since 2011 to 2025 at the shallow groundwater compliance monitoring wells MW2S and MW3. Pinchin notes that there was an elevated chloride concentration reported within MW5S in May 2024. It is Pinchin's opinion that the elevated concentration measured in May 2024, could be attributed to a general increase in yearly

precipitation causing additional salt runoff from nearby roads. Pinchin will continue to monitor the chloride concentration within monitoring well MW5S to confirm that no increasing concentration trends of concern are occurring.

Similarly, as indicated in Figure D-2, the concentration of boron within the shallow groundwater compliance monitoring wells has also remained in compliance with the trigger concentration for the Site. Generally, the concentration of boron has been stable with no apparent increasing or decreasing trend at the shallow groundwater compliance monitoring wells.

As indicated in Figure D-3, the concentration of chloride within the deep groundwater compliance monitoring well (MW2D) has slightly increased since 2011; however, it has remained below the trigger concentration for the Site. It is noted that there have been no distinct increases in concentration of the other indicator parameters within MW2D that would indicate a distinct landfill leachate influence on groundwater quality. As such, the slightly increasing concentration of chloride is likely attributable to the chemical quality of the soil fill at the Site and the chloride migrating downward into the deeper overburden over time. The concentration of chloride within MW2D should continue to be monitored over subsequent monitoring events to assess the analytical results and evaluate the concentration trend over-time. No remedial actions are required, at this time, to address the chloride concentration at MW2D.

As indicated in Figure D-4, the concentration of boron within monitoring well MW2D has also remained in compliance with the trigger concentration for the Site. Generally, the concentration of boron has been stable with no apparent increasing or decreasing trend at the deep groundwater compliance monitoring well.

Since the closure of the Site in 2009, concentrations of most parameters in the shallow and deep groundwater compliance monitoring wells have generally fluctuated or been stable with no consistent increasing or decreasing trends, with the exception of the aforementioned slightly increasing chloride concentration at MW2D.

### *10.2.2 Volatile Organic Compounds*

For the 2025 annual monitoring event, concentrations of VOC constituents within the groundwater compliance monitoring wells were generally below their respective RDLs, with the exception of an exceedance in n-hexane at MW2S.

### *10.2.3 Trigger Mechanism Assessment*

The groundwater analytical results for the 2025 annual monitoring event and their respective trigger concentrations are presented in Table 4 and Table 5. The results that were greater than their respective trigger concentrations are presented below. It is noted that if a result is greater than its respective trigger concentration a trigger mechanism for the Site is not necessarily activated, per the ECP for the Site.



Property Boundary Monitoring Well	Parameter(s)	Trigger Concentration (mg/L)	Analytical Result (mg/L)
Shallow Groundwater Monitoring Wells			
MW2S	Total Hardness	341	444
	Total Dissolved Solids	484	556
	Alkalinity, Total (as CaCO <sub>3</sub> )	427	761
MW3	Total Hardness	341	398
	Total Dissolved Solids	484	676
	Alkalinity, Total (as CaCO <sub>3</sub> )	427	8790
	Dissolved Organic Carbon	3.53	3.61
Deep Groundwater Monitoring Wells			
MW2D	Total Hardness	216	279
	Total Dissolved Solids	386	521
	Alkalinity, Total (as CaCO <sub>3</sub> )	388	765

For the 2025 monitoring event, the trigger concentration for chloride was not exceeded at the groundwater compliance monitoring wells. The analytical results for at least three (3) parameters, excluding chloride, were greater than their respective trigger concentration within the compliance monitoring wells MW2S/D and MW3. The analytical results noted in the above summary were generally consistent with historical results at the respective monitoring locations.

Monitoring well nest MW2S/D is located along the west boundary of the Site, between the landfill footprint and the McMillan Drain. The 2025 and historical analytical results at MW2S for total hardness, total dissolved solids (TDS) and alkalinity have generally fluctuated with no apparent increasing or decreasing trend. Each trigger exceedance concentration was detected within its respective historical range, with the exception of a slight increase of alkalinity compared the historical results. Pinchin recommends continued monitoring of these parameters at MW2S during subsequent monitoring events. No remedial actions are warranted at this time.



Since the closure of the Site, the concentrations for most parameters at MW2D have exhibited decreasing and/or fluctuating trends. Parameters (total hardness and TDS) detected above their respective trigger concentrations within MW2D were within respective historical ranges; however, alkalinity was detected well above its historical range. The concentration of these parameters should be monitored during subsequent monitoring events to evaluate concentration trends over time. No remedial actions are warranted at this time.

Based on the 2025 and historical results for the parameters that were greater than their respective trigger concentration at MW2S and MW2D, an increasing trend is not apparent, which indicates that the groundwater quality at these monitoring wells is stable and not degrading as a result of a landfill leachate influence. Additionally, the parameters that were greater than their respective trigger concentration at MW2S and MW2D were detected at acceptable concentrations in the surface water for the McMillan Drain, which is downgradient of the MW2 monitoring location.

Monitoring well MW3 is located along the south boundary of the Site. The 2025 and historical analytical results at monitoring well MW3 for total hardness, TDS, alkalinity and DOC, have generally fluctuated with no apparent increasing or decreasing trend. Each parameter was detected within its respective historical range, with the exception of TDS and alkalinity. Pinchin notes that the elevated alkalinity concentration reported at MW3, was significantly greater than leachate monitoring wells MW1 and MW4. Based on the 2025 and historical results for the parameters that were greater than their respective trigger concentration, an increasing trend is not apparent, which indicates that the groundwater quality at this location is stable and not degrading as a result of a landfill leachate influence. Additionally, similar to the results at monitoring wells MW2S and MW2D, the parameters that were greater than their respective trigger concentration at MW3 were detected at acceptable concentrations in the surface water within the McMillan Drain, located downgradient of monitoring well MW3. Therefore, remedial action at MW3 is not warranted, at this time. The relevant parameters within the groundwater at MW3 will continue to be monitored over subsequent monitoring events to assess the analytical results and evaluate the concentration trends over time.

Based on a review of the analytical results for the 2025 monitoring event, the groundwater quality around the waste footprint at the Site is of acceptable quality. The groundwater quality within monitoring well MW2S, MW2D and MW3 should continue to be evaluated over subsequent monitoring events to verify that the parameter concentrations that were greater than their respective trigger concentration in 2025 are not exhibiting an increasing trend of concern in the long-term. At this time, no remedial actions are warranted.

### **10.3 Surface Water**

As indicated in Figures 2 and 3, the Drain flow southwesterly along the west side of the Site. Two (2) surface water samples were collected from the Drain for the annual monitoring event. SW1 is located upstream (northeast) and SW2 is located downstream (southwest) of the waste footprint. The analytical results for the surface water monitoring stations are presented in Table D-5, Appendix D.

#### *10.3.1 General Chemistry*

Concentrations of most parameters have generally fluctuated or have been stable with no apparent increasing or decreasing trend since surface water monitoring began at the Site in 2006. The surface water quality data are compared to the PWQO, where available. In 2025, the concentration for each parameter at SW1 and SW2 satisfied the respective PWQO. These results are discussed further in Section 10.3.2. For each surface water monitoring station, the relevant historical results that have been greater than their respective PWQO are presented in Table D-5, Appendix D.

Concentration versus time plots for the primary indicator parameters (chloride and boron) for the surface water monitoring stations are presented in Figures D-5 and D-6, Appendix D. As there is no PWQO for chloride, the Guideline B-7 criterion calculated for chloride in the shallow groundwater system (99 mg/L) has been used as an indicator of landfill impacts in surface water. As depicted in Figures D-5 and D-6, the concentrations of chloride and boron at the surface water compliance monitoring station have remained in compliance with their respective trigger concentration for the Site. Since monitoring began in 2008, the concentrations of chloride and boron at the surface water monitoring stations have been generally stable with no apparent increasing or decreasing trend. It is noted that chloride concentrations at surface water station SW1 and surface water compliance monitoring station SW2 appear to be slightly increasing since May 2019, with a concentration of chloride at SW1 and SW2 above their respective historical upper limit concentrations in 2021. The chloride concentrations at SW1 and SW2 were below the 2021 reported concentrations during 2022 through 2025 annual monitoring events. The chloride concentrations at these locations have not exceeded the respective trigger concentration; however, monitoring at surface water station SW1 and surface water compliance monitoring station SW2 should continue to ensure that an increasing trend of concern is not occurring at these locations. There is no indication that a landfill leachate influence is occurring on surface water quality at these locations as it relates to chloride and boron concentrations.

#### *10.3.2 Trigger Mechanism Assessment*

As mentioned previously, the trigger mechanism for the surface water monitoring at the Site involves the comparison of the surface water analytical results from the most recent monitoring event to their respective PWQO, where available. As there is no PWQO for chloride, the Guideline B-7 criterion calculated for chloride in the shallow groundwater system was used as an indicator of landfill impacts in surface water.

The surface water analytical results for the 2025 monitoring event and their respective trigger criteria are presented in Table 6. There were no exceedances of the PWQO measured in the surface water samples collected during the 2025 monitoring event. Since the shallow groundwater trigger concentration for chloride was not exceeded and the analytical results for at least three (3) parameters, excluding chloride, were not greater than their respective trigger concentrations, the 2025 surface water quality at compliance station SW2 satisfied the relevant trigger mechanisms for the Site.

Based on the findings from the 2025 monitoring event, a landfill leachate influence was not apparent in the surface water that the Site and therefore, no remedial actions are warranted at this time.

#### 10.4 Off-Site Water Supply Well

According to the previous annual monitoring reports, a survey of private off-Site water supply wells was conducted in 2008 to identify supply wells located within 500 m of the Site. The findings from the water supply well survey are presented in the following summary:

Resident Name	Address	MECP Monitoring Well Number	Summary Comments from Survey	Sample Collected
Skinner	7261 Line 24	2255 Drilled to 9.14 m	Well casing below grade, difficult to see from surface. Solid cap, 60 years old, 26 feet (ft) deep.	Sampled in 2008 and 2009 only.
Miller	7260 Line 24	Unknown	Well buried, likely 36 inches concrete casing, no information, renters	No
Lachnit	3226 Road 181	755 Predug to 5.5 m Drilled to 27.13 m	Well inside Barn 36 inches concrete casing, 35 ft deep, more than 25 years old, enough water for 300 head of cattle	Sample in 2008 only.
Jeffery	3190 Road 181	4836 Drilled to 121 m	36 inches concrete casing – dug well, 40	No



Resident Name	Address	MECP Monitoring Well Number	Summary Comments from Survey	Sample Collected
		2256 Dug to 7 m	years old, insufficient water, no longer in use	
McCaughey	3159 Road 181	1873 and/or 4627	Resident not surveyed. No additional information	No

Previous annual monitoring reports indicated that as part of the work completed in 2008, five (5) residents closest to the Site were surveyed regarding their water supply wells and septic systems. The residents were asked about the location, depth, condition of their well and water supply. They were also asked if they would consent to having their water quality tested as part of the 2008 water supply well survey.

The Skinner water supply well (MECP No. 2255) was the closest downgradient water supply well to the Site and was incorporated into the annual monitoring program for the Site and sampled again in 2009, according to the 2017 RWDI Annual Monitoring Report. Since 2009, it has not been possible to locate/access the Skinner water supply well. The top of the Skinner water supply well casing is below grade and is likely buried.

The Municipality informed Pinchin in May 2022, that both residences closest to the Hibbert landfill have been demolished and a new build was slated for the lot to the northwest of the landfill (at the former Skinner location). During this 2025 annual monitoring event, the new build located at the former Skinner residence (now referred to as Dorssers location) had an active discharge point at the time of the annual monitoring event. The owner of the well was contacted, and permission was granted to collect a water quality sample from the water supply well through an outdoor tap.

As part of the 2025 annual monitoring event, a sample was collected on May 6, 2025. The groundwater sample was collected via an outdoor tap on the northwest portion of the property building. The property owner has indicated that this location is upstream of any treatment systems (i.e., water softening apparatus or water filtration system) used to treat the groundwater from the supply well. Prior to sample collection, water was discharged from the aforementioned tap for five (5) minutes in order to flush out standing water within the supply piping between the water supply well and the tap. The sample was collected directly from the tap into a laboratory-prepared, unpreserved sample bottle for transfer to relevant bottles with preservatives.

It is noted that groundwater samples are collected from the Dorssers water supply well to evaluate the raw groundwater quality at this location and determine if the groundwater has been impacted by landfill leachate. The raw groundwater sample is not collected from a tap intended as a source for drinking water and thus, the relevant analytical results for the collected sample are not intended to evaluate the quality of drinking water for this residence.

The 2025 and historical water quality data collected from the off-Site water supply well is presented in Table D-4, Appendix D.

For the groundwater samples collected in 2025, the results that were greater than their respective ODWS are summarized below.

<b>Parameter(s)</b>	<b>ODWS (mg/L)</b>	<b>May 2025 Analytical Result (mg/L)</b>
Total Hardness (as CaCO <sub>3</sub> )	80-100	464
Total Dissolved Solids	500	593
Fluoride	1.5	1.9

The above-noted analytical results that were greater than their respective ODWS are not interpreted to be landfill related (based on the up/transgradient well location). In comparison to the groundwater quality measured at the same location in 2023 and 2024, generally parameters were within their respective historical concentration, with the exception of TDS and fluoride which were slightly above their historical upper concentration limit.

Concentrations of VOC constituents within the Dorssers water supply well were below their respective RDLs for the May 2025 monitoring event.

In summary, based on the May 2025 sampling of the water supply well for Dorssers, there is not an apparent landfill effect noted for the groundwater quality at this location; however, monitoring should continue at this location to establish concentration trends and ensure that no concentration trends of concern are occurring.

## **11.0 LANDFILL GAS MONITORING RESULTS**

As part of the annual monitoring program, landfill gas (methane) measurements were completed at each of the leachate and groundwater monitoring well locations on May 6, 2025. The 2025 landfill gas monitoring results are tabulated in Table F-1, Appendix F, along with the historical data.

For the 2025 monitoring event, the landfill gas was not detected at each of the leachate and groundwater monitoring wells at the Site, with the exception of MW4. Landfill gas has typically not been detected in any of the leachate or groundwater monitoring wells since monitoring began in 2006, with the exception of

MW4 in May 2007. The detection limit concentrations of landfill gas are not interpreted to reflect a persistence of landfill gas migrating in the vadose zone (unsaturated portion of the shallow subsurface) beyond the waste footprint at this Site.

As noted in previous annual monitoring reports, the screened interval of select groundwater monitoring wells used to assess for landfill gas may be below the groundwater table and therefore, do not reliably represent, from a vapour perspective, the concentrations of gases in the vadose (unsaturated portion) of the shallow soil system(s) at the Site. However, as landfill gas was not detected beyond the waste footprint to the west at the Site in 2025, and that the nearest structure to the Site is the farmhouse located approximately 330 m north of the Site, there should be no explosive concerns related to landfill gas migration with the vadose zone for the nearby residence.

Based on the findings from the monitoring network, landfill gas does not appear to be generated within the waste mound or migrating beyond the waste footprint at levels that would represent an explosive risk to nearby structures. As such, no changes to the landfill gas monitoring network are warranted at this time.

### **11.1 Winter Gas Monitoring Results**

As noted previously, two of the three (3) winter landfill gas monitoring events required by Condition 3.3 of the Waste ECA (Notice No. 2), were completed during the 2024/2025 winter season.

For each winter landfill gas monitoring event completed during the 2024/2025 winter season, landfill gas was not detected at each of the leachate and groundwater monitoring wells at the Site.

The winter landfill gas monitoring results for the 2024/2025 winter season are consistent with historical findings for the annual monitoring events for the Site. The 2017, 2020 through 2025 winter landfill gas results are presented in Appendix F, Table F-2.

The 2025 and historical landfill gas monitoring results for the annual and winter monitoring events have not revealed a significant or consistent presence of landfill gas at any of the leachate and groundwater monitoring wells at the Site. Based on landfill gas monitoring results for the Site to-date, landfill gas does not appear to be generated within the waste mound or migrating beyond the waste footprint within the subsurface at concentrations that would represent an explosive risk to nearby structures. As such, it is recommended that winter landfill gas monitoring for the Site be discontinued. Landfill gas should continue to be monitored at the Site only as part of the annual monitoring program to assess for the presence and, if detected, concentrations of landfill gas over time. The winter landfill gas monitoring component should be discontinued.

## **12.0 SITE INSPECTION OBSERVATIONS**

The Waste ECA and Closure Plan for the Site recommend annual Site inspections. The annual Site inspection was conducted by Pinchin on May 6, 2025. A copy of the annual Site inspection record is provided in Appendix G. Findings from the 2025 annual Site inspection are presented below.

- The front gate at the Site was closed and secured with a padlock. Pinchin notes that the fence adjacent to the front gate is cut. It is Pinchin's recommendation that this fencing be repaired;
- An information sign at the front entrance identifies that the Site is closed;
- There were no exposed areas of soil cover material over the waste footprint. The cover material at the Site was completely covered by vegetation;
- There was no litter observed at the Site;
- There were no observed signs of vermin or vectors at the Site that would warrant remedial action;
- There were no indications of leachate outbreaks at the Site;
- There were no reports or indications of a spill occurring at the Site in 2025;
- There were no reports or indications of unacceptable waste being received at the Site in 2025;
- There were no complaints received about the Site in 2025; and
- There were no operational issues reported for the Site in 2025.

The Municipality also conducted monthly inspections during 2025. There were no additional issues identified by the Municipality during the monthly Site inspections in 2025.

## **13.0 2026 MONITORING PROGRAM**

The proposed 2026 Monitoring Program considers the findings of this report and the approved monitoring plan presented in the Waste ECA and the EMP for the Site. Details of the annual monitoring program for the Site, including analytes, are summarized in Table 1 with assessment locations depicted in Figure 2.

An annual monitoring report that details the findings of the 2026 monitoring period will be prepared and submitted to the MECP by December 11, 2026. The annual report should be prepared in consideration of historical report submissions while acknowledging the purpose and objectives of the monitoring program, which are summarized in Section 1.3 of this report.

## **14.0 CONCLUSION**

Based on the findings presented in this report, the following conclusions are provided.

The monitoring program for the Site has been conducted in accordance with Condition 3.0 of the Waste ECA since 2008. Based on the findings of the 2025 Monitoring Program for the Site, the following conclusions were generated:

- Locally, the shallow groundwater flow is influenced by surficial features such as the Drain, which flows west along the west boundary of the Site. The shallow groundwater elevations measured in 2025 was consistent with historical elevations and the flow pattern demonstrated flow to the west toward the Drain. The deep groundwater flow system is inferred to flow in a southwesterly direction;
- In 2025, the analytical results that were greater than their respective Ontario Drinking Water Standard (ODWS) with the groundwater were generally consistent with historical results, with the exception of alkalinity which appeared to be attributed to an exogenic source or may more likely be anomalous. The concentrations of most parameters in the shallow and deep groundwater monitoring wells have generally fluctuated or been stable with no apparent increasing or decreasing trend since groundwater monitoring began at the Site in 2005;
- The 2025 and historical concentrations of the primary leachate indicator parameter, chloride and boron, have remained in compliance with the respective trigger concentrations for the Site. There have also not been increasing concentration trends of concern at the groundwater compliance monitoring wells that would indicate an impending exceedance of a trigger mechanism for the Site or warrant remedial action at this time;
- Since 2011, the concentration of chloride has slightly increased at MW2D, however, it has remained below the trigger concentration for the Site. It is noted that there have been no distinct increases in concentration of the other indicator parameters within MW2D that would indicate a distinct landfill leachate influence on groundwater quality. The slightly increasing concentration of chloride is likely attributable to the chemical quality of the soil fill at the Site. No remedial actions are required, at this time, to address the chloride concentration at MW2D;
- Based on a review of the analytical results for the 2025 annual monitoring event, the groundwater quality around the waste footprint at the Site is of acceptable quality. The 2025 analytical results for select parameters (hardness, TDS, alkalinity and DOC) were greater than their respective trigger concentrations for groundwater quality at compliance monitoring wells MW2S, MW2D and MW3. However, the 2025 and historical analytical results for the select parameters at these monitoring wells have generally been stable, fluctuating or exhibiting a decreasing trend. The parameters that exceeded their respective trigger concentration were within their historical concentration ranges, with the

exception of alkalinity within MW2D. The groundwater quality at these monitoring wells is considered stable and are not interpreted to be degrading as a result of a landfill leachate influence. No remedial actions are required, at this time, to address the analytical results that were greater than their respective trigger concentration. Concentrations of select parameters above the ODWS and respective trigger concentrations should be monitored during subsequent monitoring events to ensure that an increasing trend of concern is not occurring at these locations;

- The concentrations of volatile organic compound (VOC) constituents within the groundwater compliance monitoring wells were below their respective laboratory reportable detection limits (RDLs) for the 2025 monitoring event;
- Surface water flow measurements were collected at both SW1 and SW2 surface water locations on May 6, 2025. Surface water flow was generally consistent with historical measurements;
- The surface water quality at the compliance station (SW2) satisfied the applicable Provincial Water Quality Objectives (PWQO) and the relevant trigger mechanisms and for the Site during the 2025 annual monitoring event. It is noted that chloride concentrations at surface water station SW1 and surface water compliance monitoring station SW2 appear to be slightly increasing since May 2019, with a concentration of chloride at SW2 above its historical upper limit concentration in May 2021, and an overall fluctuating trend since 2022. Monitoring at surface water station SW1 and surface water compliance monitoring station SW2 should continue to ensure that an increasing trend of concern is not occurring at these locations. There is no indication that a landfill leachate influence is occurring on surface water quality at these locations as it relates to chloride and boron concentrations. No remedial action is warranted at this time;
- One water sample was collected from the Dorssers drinking water supply well. The analytical results for total hardness, total dissolved solids and fluoride were greater than their respective ODWS during the 2025 monitoring event. It is recommended that the Dorssers drinking water supply well continue to be monitored to establish concentration trends and to ensure no concentration trends of concern are occurring;
- Landfill gas was not detected at any of the leachate and groundwater monitoring wells at the Site for the 2025 annual monitoring event. Based on monitoring findings from the established monitoring network to-date, landfill gas does not appear to be generated within the waste mound or migrating beyond the waste footprint at levels that would represent an explosive risk to nearby structures;

- There were no deficiencies noted during the 2025 annual Site inspection conducted by Pinchin, with the exception that the fence adjacent to the front gate is cut. It is Pinchin's recommendation that this fencing be repaired; and
- There were no deficiencies noted during the 2025 annual Site inspection conducted by Pinchin. No deficiencies were noted during the monthly inspections conducted by the Municipality that would warrant remedial action.

Based on the findings of the 2025 Monitoring Program, the following recommendations are provided for consideration:

- Monitoring at the Site should be continued in 2026, in accordance with the approved monitoring program as summarized in Table 1. No deviations from the approved monitoring program are recommended;
- The concentration of chloride within compliance monitoring well MW2D should continue to be monitored over subsequent monitoring events to assess the analytical results and evaluate the concentration trend over time. No remedial action is warranted at this time;
- The groundwater quality within monitoring wells MW2S, MW2D and MW3 should continue to be evaluated over subsequent monitoring events to confirm that the parameter concentrations that exceeded their trigger concentration in 2025 are not exhibiting an increasing trend long term. No remedial action is warranted at this time;
- Monitoring at surface water station SW1 and surface water compliance monitoring station SW2 should continue to ensure that an increasing trend of concern for chloride is not occurring at these locations. There is no indication that a landfill leachate influence is occurring on surface water quality at these locations as it relates to chloride and boron concentrations. No remedial action is warranted at this time;
- Sampling of the residential Dorssers supply well should continue during future monitoring efforts to confirm the current conditions as they relate to potential effects from the former waste disposal activities associated with the Site;
- Repair fencing adjacent to the front gate; and
- The 2025 and historical landfill gas monitoring results for the annual monitoring events had not revealed a significant or consistent presence of landfill gas at any of the leachate and groundwater monitoring wells at the Site. Landfill gas should continue to be monitored at the Site only as part of the annual monitoring program to assess for the presence and, if detected, concentrations of landfill gas over time. The winter landfill gas monitoring component should be discontinued.



## **15.0 STUDY LIMITATIONS AND USE OF REPORT**

This Water Quality Monitoring Program was performed for the Corporation of the Municipality of West Perth (Client) in order to investigate the environmental condition of the groundwater, leachate and surface water at the Hibbert Landfill (Site). The term recognized environmental condition means the presence or likely presence of any hazardous substance on a property under conditions that indicate an existing release, past release, or a material threat of a release of a hazardous substance into structures on the property or into the ground, groundwater, or surface water of the property. This Water Quality Monitoring Program does not quantify the extent of the current and/or recognized environmental condition or the cost of any remediation.

Conclusions derived are specific to the immediate area of study and cannot be extrapolated extensively away from sample locations. Samples have been analyzed for a limited number of contaminants that are expected to be present at the Site, and the absence of information relating to a specific contaminant does not indicate that it is not present.

No environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions on a property. Performance of this Water Quality Monitoring Program to the standards established by Pinchin is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions on the Site, and recognizes reasonable limits on time and cost.

This Water Quality Monitoring Program was performed in general compliance with currently acceptable practices for environmental site investigations, and specific Client requests, as applicable to this Site.

This report was prepared for the exclusive use of the Client and the MECP, subject to the conditions and limitations contained within the duly authorized work plan. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third parties. If additional parties require reliance on this report, written authorization from Pinchin will be required.

Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. Furthermore, this report should not be construed as legal advice.

Pinchin will not be responsible for any consequential or indirect damages. Pinchin will only be held liable for damages resulting from the negligence of Pinchin. Pinchin will not be liable for any losses or damage if the Client has failed, within a period of two years following the date upon which the claim is discovered within the meaning of the Limitations Act, 2002 (Ontario), to commence legal proceedings against Pinchin to recover such losses or damage.



Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time.

## **16.0 CLOSURE**

We trust that this 2025 Annual Monitoring Report, prepared in accordance with Condition 5.0 of the Waste Disposal Site Environmental Compliance Approval Number A151301 for the Hibbert Landfill in the Municipality of West Perth, Ontario, is satisfactory for your requirements.

## 17.0 REFERENCES

The following documents, persons or organizations provided information used in this report:

1. 2019-2024 Annual Monitoring Reports, Hibbert Landfill, Township of Hibbert, Ontario prepared by Pinchin for the Corporation of Municipality of West Perth.
2. “Municipality of West Perth, Hibbert Landfill, 2018 Annual Monitoring Event Summary” prepared by RWDI Air Inc. for the Municipality of West Perth and dated July 6, 2019.
3. “Municipality of West Perth, Hibbert Landfill, 2017 Annual Monitoring Report” prepared by RWDI Air Inc. for the Municipality of West Perth and dated December 6, 2017.
4. Ministry of Northern Development and Mines – Surficial Materials:  
<https://www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth/surficial-geology>.
5. Ministry of Northern Development and Mines – Bedrock Geology:  
<https://www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth/bedrock-geology>.
6. Ministry of the Environment. 2003. Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines. Revised June 2006.
7. Ministry of the Environment. 2010. Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water – Technical Guidance Document, November 2010.
8. Ministry of the Environment. 2012. Landfill Standards – A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites. January 2012.
9. R.J. Burnside & Associates Limited. 2007. Hydrogeological Investigation, Hibbert Landfill Site, Municipality of West Perth. File: MSO10830.11. December 2007.
10. SGRA. 2010. Upper Thames River Source Water Protection Area, Tier 2 Water Budget, Significant Groundwater Recharge Area Technical Memorandum, Upper Thames River Conservation Authority, 31 May 2010.

## **TABLES**

**TABLE 1**  
**ANNUAL MONITORING PROGRAM**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

<b>Monitoring Locations</b>				
<b>Monitoring Group</b>	<b>Monitoring Location ID</b>			<b>Total Number</b>
Leachate	MW1 and MW4			2
Groundwater (GW)	Shallow: MW2S, MW3 and MW5S			3
	Deep: MW2D and MW5D			2
Surface Water (SW)	SW1 and SW2			2
Residential (Res)	Dorssers			1
<b>Monitoring Locations</b>				
<b>Task</b>	<b>Monitoring Locations</b>	<b>Field Indicator Parameters</b>	<b>Lab Analytical Parameters</b>	<b>Monitoring Frequency<sup>1</sup></b>
Liquid Levels	Leachate & GW Wells	N/A	N/A	Annually
Combustible Gas Monitoring	Leachate & GW Wells	Methane (CH <sub>4</sub> )	N/A	Annually
Monitoring Well Purging	Leachate & GW Wells	N/A	N/A	Annually
Sample Collection	Leachate, GW, and Res Locations	FIP List <sup>2</sup>	LAP-GC List <sup>4</sup> & VOCs	Annually
	SW Locations	FIP-SW List <sup>3</sup>	LAP-GC List <sup>4</sup>	Annually
Surface Water Flow	SW Locations	N/A	N/A	Annually
QA/QC Duplicate Sampling	One (1) GW Well & One (1) SW Locations	Equivalent to Original Sample	Equivalent to Original Sample	Annually
QA/QC Trip Blanks	One (1) Set of VOC Trip Blanks per Sample Shipment	N/A	VOCs	Annually
Site Inspection	Site	N/A	N/A	Annually

Notes: 1. Annual monitoring tasks are completed in the Spring, typically in May.

2. Field Indicator Parameters (FIP): Temperature, pH, and Electrical Conductivity.

3. Field Indicator Parameters - Surface Water (FIP-SW): Temperature, pH, Electrical Conductivity, Dissolved Oxygen, and Turbidity

4. Lab Analytical Parameters - General Chemistry (LAP-GC): Total Hardness, pH, TDS, Alkalinity (Bicarbonate, Carbonate, and Total), Total NH<sub>3</sub>, Br, Cl, F, NO<sub>3</sub>, NO<sub>2</sub>, NO<sub>3</sub> + NO<sub>2</sub>, PO<sub>4</sub>, SO<sub>4</sub>, DOC, Al, As, Ba, B, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Mn, K, Se, Si, Na and Zn.

5. VOCs denotes volatile organic compounds.

**TABLE 2**  
**MONITORING WELL CONSTRUCTION DETAILS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

<i>Well Number</i>	<i>Ground Surface (mASL)</i>	<i>Measuring Point (mASL)</i>	<i>Stick-Up (m)</i>	<i>Total Well Depth (mBGS)</i>	<i>Screen Length (m)</i>	<i>Stratigraphic Unit Screened</i>	<i>Hydraulic Conductivity (m/sec)</i>
MW1	311.77	312.95	1.18	4.57	3.05	Fill Sand & Gravel	$1.3 \times 10^{-5}$
MW2S	310.78	311.51	0.73	4.57	3.05	Silt Silty Sand Silt Till	$5.2 \times 10^{-6}$
MW2D	310.85	311.49	0.64	9.14	3.05	Silt Till	$8.7 \times 10^{-9}$
MW3	310.62	311.34	0.72	4.57	3.05	Silt Silt Till	$5.8 \times 10^{-7}$
MW4	312.40	313.57	1.17	4.57	3.05	Fill Silt Silt Till	-
MW5S	311.61	312.45	0.84	4.57	3.05	Clayey Silt to Silty Clay Clayey Silt Clayey Silt Till	-
MW5D	311.68	312.59	0.91	9.14	3.05	Sand & Clay Till	-

- Notes: 1. mASL denotes metres above sea level.  
2. mBGS denotes metres below ground level.  
3. Benchmark - All elevations were measured relative to the top of the protective steel casing at MW4 (assumed to be 100 mASL). Based on the local 1:10,000 scale Ontario Base Mapping, the benchmark elevation of 100.00 is equivalent to 312.153 mASL.  
4. The elevations were surveyed on July 16, 2008, with the exception of MW5S and MW5D (surveyed on September 7, 2010).  
The site was graded in 2011 and the pipes at MW1 and MW4 were extended. The top of the pipes were surveyed in September 2011. Following the installation of protective casings at MW1 and MW4, the pipes were then cut to fit the casings and the wells were resurveyed in August 2012. The total wells depths at MW1 and MW4 were adjusted to match pipe extensions.  
6. Hydraulic conductivity testing was not completed at MW4, MW5S or MW5D.

**TABLE 3**  
**SURFACE WATER FLOW**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

<i>Date</i>	<i>Upstream Location</i>	<i>Downstream Location</i>
	SW1 L/s	SW2 L/s
09-May-06	36	38
22-May-07	47	50
26-Jun-08	52	50
20-May-09	90	191
10-May-10	312	410
24-May-11	287	454
14-May-12	6	8
25-Apr-13	460	638
21-May-14	180	150
21-May-15	56	-
13-May-16	191	185
05-May-17	3,841	4,105
May-18	-	-
01-May-19	915	996
07-May-20	54	96
04-May-21	200	169
04-May-22	653	-
10-May-22	59	22
03-May-23	188	292
13-May-24	53	67
06-May-25	106	91

- Notes:
1. L/s denotes litres per second.
  2. Blank denotes data not available.
  3. Due to conditions at SW2 in May 2015, it was not possible to safely measure the surface water flow rate at this location; however, based on visual observations, the flow rate was likely similar to that measured at SW1.
  4. Due to conditions at SW2 on May 4, 2022, it was not possible to safely measure the surface water flow rate at this location; however, based on visual observations, the flow rate was likely similar to that measured at SW1. A secondary flow measurement was collected on May 10, 2022, at both SW1 and SW2 locations.

**TABLE 4**  
**SUMMARY OF GROUNDWATER COMPLIANCE FOR THE SHALLOW FLOW SYSTEM**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Parameter	Background Quality (Cb)	ODWS (Cr)	X	Guideline B-7 Criteria (Cm)	Background Well	Property Boundary Wells		Additional Well
					MW5S	MW2S	MW3	MW4
					May-25	May-25	May-25	May-25
<b>General Chemistry</b>								
Total Hardness (as CaCO <sub>3</sub> )	341	100	0.5	<u>341</u>	319	<b>444</b>	<b>398</b>	342
Total Dissolved Solids	468	500	0.5	484	585	<b>556</b>	<b>676</b>	685
Alkalinity, Total (as CaCO <sub>3</sub> )	355	500	0.5	427	872	<b>761</b>	<b>8790</b>	749
Chloride	13.6	250	0.5	99	5.73	2.55	4.78	24.6
Fluoride	0.65	1.5	0.25	0.861	0.771	0.324	0.181	0.238
(Nitrate + Nitrite) as N	1.223	10	0.25	3.42	4.76	1.03	0.0950	0.0690
Nitrate-N	1.272	10	0.25	3.45	4.76	1.03	0.095	<0.040
Nitrite-N	0.020	1.0	0.25	0.265	<0.010	<0.010	<0.010	0.069
Sulphate	58.0	500	0.5	279	18.4	7.15	5.59	2.08
Dissolved Organic Carbon	2.1	5.0	0.5	3.53	1.65	2.48	<b>3.61</b>	3.47
Aluminum	0.0052	0.1	0.5	0.0526	0.0018	0.0012	0.0017	0.0137
Arsenic	0.00080	0.01	0.25	0.0031	0.0004	0.00016	0.0002	0.00076
Barium	0.10	1.0	0.25	0.3260	0.116	0.0968	0.069	0.2670
Boron	0.018	5.0	0.25	1.3	<0.010	0.036	0.025	0.313
Cadmium	0.00005	0.005	0.25	0.00129	<0.0000050	0.0000226	0.0000255	0.0000243
Chromium	0.0009	0.05	0.25	0.013142	<0.00050	<0.00050	<0.00050	<0.00050
Copper	0.0013	1.0	0.5	0.50066	0.00075	0.00156	0.00165	0.00112
Iron	0.0124	0.30	0.5	0.156	<0.010	0.01	0.014	0.268
Lead	0.00020	0.01	0.25	0.002653	<0.000050	<0.000050	<0.000050	<0.000050
Manganese	0.0012	0.05	0.5	0.02560	0.00011	0.00202	0.0169	0.110
Selenium	0.0019	0.05	0.25	0.013961	0.00101	0.00478	0.000411	0.000482
Sodium	49.5	200	0.5	125	20	12.9	12.9	132
Zinc	0.0025	5.0	0.5	2.5	<0.0010	0.0018	<0.0010	0.0019

- Notes: 1. Background quality is based on the geometric mean of the historical results for monitoring well MW5S.  
2. Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, as revised June 2006 (ODWS).  
3. Guideline B-7 Criteria (Cm) = Cb + X(Cr-Cb).  
4. Cm = Maximum concentration of a contaminant that may exist beyond the property boundary.  
5. Cb = Concentration (geometric mean of historical results) for a given parameter at the background well.  
6. Cr = Maximum allowable concentration of a parameter in groundwater (based on the ODWS criteria).  
7. X = Reduction constant associated with assessing whether a parameter of concern is health related (0.25) or non-health related (0.5), based on the ODWS criteria.  
8. If Background Quality < Detection Limit (DL), half the DL value is used in the Guideline B-7 calculation.  
9. Groundwater compliance is assessed based on the analytical results for the Property Boundary Wells; results for the Additional Well MW4 is provided for reference.  
10. Underline denotes where Cb is > ODWS criteria, Cb = Cm.  
11. Bold and shaded denotes concentration at a Property Boundary Well exceeds Guideline B-7 Criteria.  
12. Dash (-) denotes data not available.  
13. Unless otherwise stated, all units are reported in mg/L.  
14. Compliance criteria for chloride is 75% of the calculated Guideline B-7 Criteria.

**TABLE 5**  
**SUMMARY OF GROUNDWATER COMPLIANCE FOR THE DEEP FLOW SYSTEM**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Parameter	Background Quality (Cb)	ODWS (Cr)	X	Guideline B-7 Criteria (Cm)	Background Well	Property Boundary Well
					MW5D	MW2D
					May-25	May-25
<b>General Chemistry</b>						
Total Hardness (as CaCO <sub>3</sub> )	217	100	0.5	<u>217</u>	235	<b>279</b>
Total Dissolved Solids	269	500	0.5	385	334	<b>521</b>
Alkalinity, Total (as CaCO <sub>3</sub> )	264	500	0.5	382	281	<b>765</b>
Chloride	6.3	250	0.5	96	12.1	37.8
Fluoride	1.39	1.5	0.25	1.42	1.54	0.985
(Nitrate + Nitrite) as N	0.041	10	0.25	2.5	<0.0224	0.0270
Nitrate-N	0.037	10	0.25	2.5	<0.020	0.027
Nitrite-N	0.018	1.0	0.25	0.264	<0.010	<0.010
Sulphate	10.6	500	0.5	255	14.2	34.6
Dissolved Organic Carbon	1.5	5.0	0.5	3.25	0.97	1.7
Aluminum	0.007	0.10	0.5	0.0534	0.0223	0.0041
Arsenic	0.0060	0.010	0.25	0.006979	0.00329	0.00062
Barium	0.047	1.0	0.25	0.2855	0.0437	0.0455
Boron	0.11	5.0	0.25	1.33	0.114	0.061
Cadmium	0.00005	0.005	0.25	0.0012859	<0.000050	0.0000073
Chromium	0.00084	0.05	0.25	0.0131	<0.00050	<0.00050
Copper	0.00062	1.0	0.5	0.50	0.00037	0.00059
Iron	0.014	0.30	0.5	0.157	0.016	<0.010
Lead	0.00026	0.01	0.25	0.00269	<0.000050	<0.000050
Manganese	0.006	0.05	0.5	0.02818	0.00069	0.00028
Selenium	0.00030	0.01	0.25	0.0027	<0.000050	0.000087
Sodium	9.8	200	0.5	105	25.5	69.1
Zinc	0.0021	5.0	0.5	2.5	<0.0010	<0.0010

- Notes: 1. Background quality is based on the geometric mean of the historical results for monitoring well MW5D.  
2. Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, as revised June 2006 (ODWS).  
3. Guideline B-7 Criteria (Cm) = Cb + X(Cr-Cb).  
4. Cm = Maximum concentration of a contaminant that may exist beyond the property boundary.  
5. Cb = Concentration (geometric mean of historical results) for a given parameter at the background well.  
6. Cr = Maximum allowable concentration of a parameter in groundwater (based on the ODWS criteria).  
7. X = Reduction constant associated with assessing whether a parameter of concern is health related (0.25) or non-health related (0.5), based on the ODWS criteria.  
8. If Background Quality < Detection Limit (DL), half the DL value is used in the Guideline B-7 calculation.  
9. Groundwater compliance is assessed based on the analytical results for the Property Boundary Well.  
10. Underline denotes where Cb is > ODWS criteria, Cb = Cm.  
11. Bold and shaded denotes concentration at a Property Boundary Well exceeds Guideline B-7 Criteria.  
12. Dash (-) denotes data not available.  
13. Unless otherwise stated, all units are reported in mg/L.  
14. Compliance criteria for chloride is 75% of the calculated Guideline B-7 Criteria.

**TABLE 6**  
**SUMMARY OF SURFACE WATER COMPLIANCE**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

<i>Parameter</i>	<i>PWQO</i>	<i>Background Station</i>	<i>Compliance Station</i>
		<i>SW1</i>	<i>SW2</i>
		<i>May-25</i>	<i>May-25</i>
<b>General Chemistry</b>			
Alkalinity, Total (as CaCO <sub>3</sub> )	>25% Decrease	220	226
Chloride	99	25.8	27.4
Arsenic	0.005	0.00038	0.00030
Boron	0.2	0.014	0.016
Cadmium	0.005	0.0000198	0.0000094
Copper	0.005	0.00127	0.00095
Iron	0.3	0.291	0.087
Lead	0.005	0.00028	0.000067
Selenium	0.1	0.000363	0.00033
Zinc	0.02	0.0044	<0.0030
Dissolved Aluminum	0.075	0.0027	0.0030

- Notes: 1. PWQO denotes Provincial Water Quality Objectives of the Ministry of the Environment and Energy, as revised February 1999.  
2. Background quality is based on the result for upstream surface water station SW1.  
3. Surface water compliance is assessed based on the analytical results for downstream station SW2.  
4. There is no PWQO for chloride; the calculated Guideline B-7 Criteria for chloride in the shallow groundwater wells is provided for reference.  
5. Bold and shaded denotes concentration exceeds PWQO.  
6. Blank denotes data not available.  
7. Unless otherwise stated, all units are reported in mg/L.

**TABLE 7**  
**FIELD DATA SUMMARY**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Monitoring Location	Gas Measurement	Water Measurements			Analytical Chemistry		Monitoring Well Condition	Comments
	CH <sub>4</sub> (%)	pH	Conductivity (µS/cm)	Temperature (°C)	General Chemistry	VOCs		
MW1	0.00	6.85	994	12.0	Yes	Yes	No observed deficiencies.	None
MW2S	0.00	7.19	942	12.0	Yes	Yes	No observed deficiencies.	None
MW2D	0.00	7.18	829	11.1	Yes	Yes	No observed deficiencies.	None
MW3	0.00	6.68	783	8.5	Yes	Yes	No observed deficiencies.	None
MW4	0.50	7.15	1223	12.5	Yes	Yes	No observed deficiencies.	None
MW5S	0.00	7.28	677	11.9	Yes	Yes	No observed deficiencies.	None
MW5D	0.00	7.46	530	11.2	Yes	Yes	No observed deficiencies.	None
Dorssers	N/A	7.37	878	11.6	Yes	Yes	N/A	None

Monitoring Location	Location Description	Water Measurements			Analytical Chemistry		Flow (L/s)	Comments		
		pH	Conductivity (µS/cm)	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (NTU)			General Chemistry	VOCs
SW1	Upgradient of the Site in McMillan Drain (upstream of a bend in the drain)	8.24	561	15.7	16.8	5.44	Yes	No	106	None
SW2	Downgradient of the Site in McMillan Drain (approx. 80 m downstream of the Site)	8.15	579	15.1	16.1	7.92	Yes	No	91	Duplicate: DUP-03

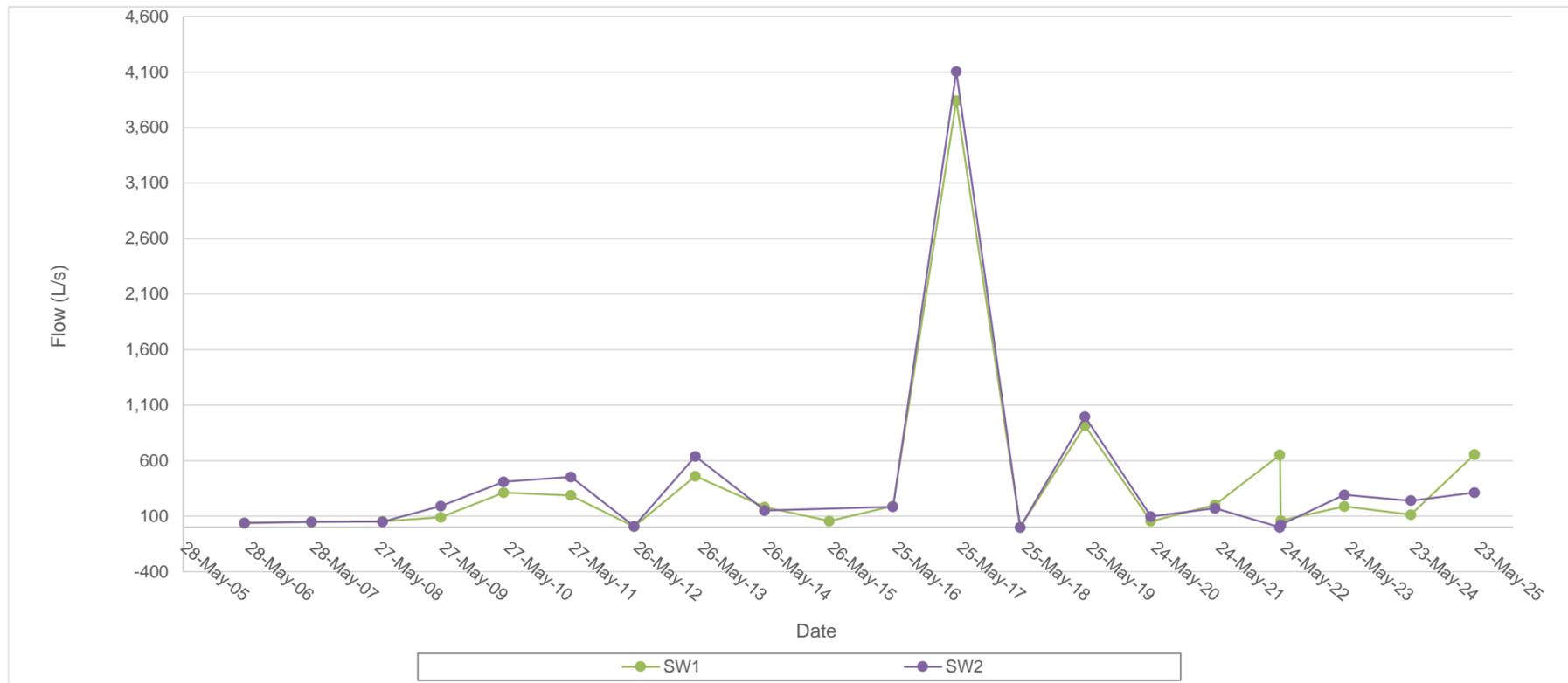
- Notes: 1. CH<sub>4</sub> denotes methane gas.  
2. Methane gas reading are expressed as percent volume in air.  
3. pH denotes pH units.  
4. µS/cm denotes microsiemens per centimetre.  
5. VOCs denotes volatile organic compounds.  
6. mg/L denotes milligrams per litre.  
7. NTU denotes nephelometric turbidity units.  
8. L/s denotes litres per second.

**TABLE 8**  
**SITE FEATURE GPS COORDINATES**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

<i>Site Feature Name</i>	<i>UTM Coordinates</i>	
	Easting	Northing
Front Gate	470547	4811329
MW1	470298	4810956
MW2S	470249	4810936
MW2D	470251	4810938
MW3	470212	4810856
MW4	470270	4810924
MW5S	470461	4811199
MW5D	470466	4811208
SW1	470381	4811089
SW2	470077	4810788

- Notes:
1. Coordinates are referenced to NAD83.
  2. All the site features are in Zone 17.
  3. The front gate was tied to GPS coordinates using Ontario Base Mapping (OBM).
  4. OBM mapping has a relative accuracy of +/- 5m.
  5. The features at the Site were surveyed relative to each other (submetre accuracy).

**SURFACE WATER FLOW**  
**2006 - 2025**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**



## FIGURES



**LEGEND**

 APPROXIMATE SITE BOUNDARY

**NOTES:**

- 1. AIR PHOTO FROM GOOGLE EARTH 2025



CLIENT  
MUNICIPALITY OF WEST PERTH

PROJECT NAME  
2025 ANNUAL MONITORING REPORT

PROJECT LOCATION  
HIBBERT LANDFILL

FIGURE NAME  
SITE LOCATION MAP

SCALE 1:9000	PROJECT NO. 333568.002
-----------------	---------------------------

DATE JULY 2025	FIGURE NO. 1
-------------------	-----------------



**LEGEND**

	APPROXIMATE SITE BOUNDARY
	SURFACE WATER SAMPLE LOCATION
	MONITORING WELL LOCATION AND DESIGNATION
	WATER SUPPLY WELL

- NOTES:**
1. PLAN DETAILS OBTAINED FROM 2018 HIBBERT LANDFILL ANNUAL MONITORING REPORT (RWDI, 2018)
  2. AIR PHOTO FROM GOOGLE EARTH 2025



CLIENT  
MUNICIPALITY OF WEST PERTH

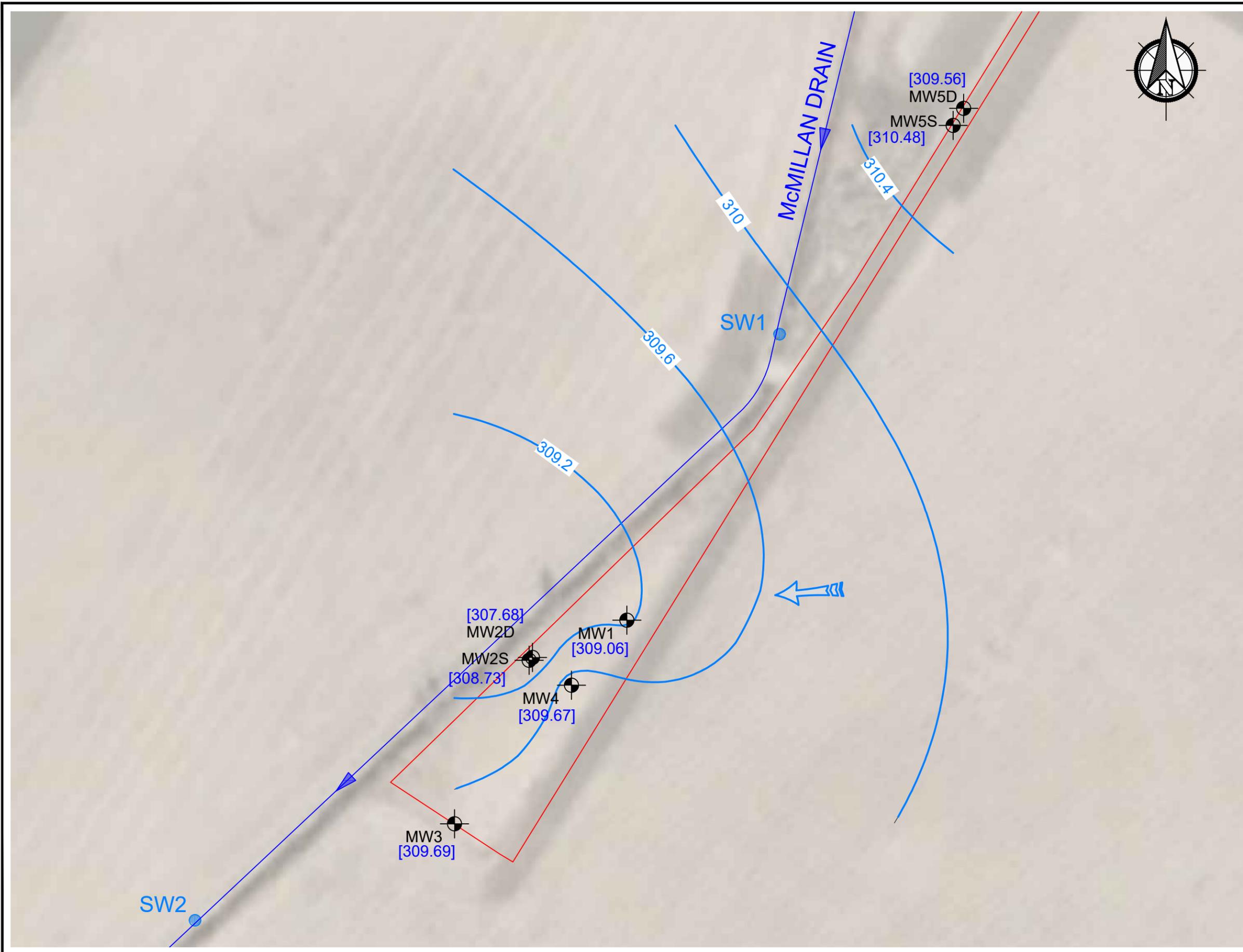
PROJECT NAME  
2025 ANNUAL MONITORING REPORT

PROJECT LOCATION  
HIBBERT LANDFILL

FIGURE NAME  
SITE PLAN

SCALE	PROJECT NO.
1:3000	333568.002

DATE	FIGURE NO.
JULY 2025	2



**LEGEND**

- APPROXIMATE SITE BOUNDARY
- SW1 SURFACE WATER SAMPLE LOCATION
- MONITORING WELL LOCATION AND DESIGNATION
- [309.93] GROUNDWATER ELEVATION (MASL)
- MASL METERS ABOVE SEA LEVEL
- 310 GROUNDWATER CONTOUR ELEVATION
- INFERRED GROUNDWATER FLOW DIRECTION ARROW

- NOTES:**
1. PLAN DETAILS OBTAINED FROM 2018 HIBBERT LANDFILL ANNUAL MONITORING REPORT (RWDI, 2018)
  2. AIR PHOTO FROM GOOGLE EARTH 2025



CLIENT  
MUNICIPALITY OF WEST PERTH

PROJECT NAME  
2025 ANNUAL MONITORING REPORT

PROJECT LOCATION  
HIBBERT LANDFILL

FIGURE NAME  
SHALLOW GROUNDWATER CONTOURS (MAY 06, 2025)

SCALE 1:2000	PROJECT NO. 333568.002
DATE JULY 2025	FIGURE NO. 3

**APPENDIX A**  
**Supporting Documentation**

**Appendix A-1**  
**Environmental Compliance Approval – Notice No.1**

AMENDMENT TO PROVISIONAL CERTIFICATE OF  
APPROVAL  
WASTE DISPOSAL SITE  
NUMBER A151301  
Notice No. 1  
Issue Date: September 18, 2008

The Corporation of the Municipality of West Perth  
169 St. David St P.O. Box 609  
Mitchell, Ontario  
N0K 1N0

Site Location: West Perth (Hibbert Landfill)  
Lot 22, Concession 9 (Former Geographic Township of Hibbert)  
West Perth Municipality, County of Perth

*You are hereby notified that I have amended Provisional Certificate of Approval No. A151301 issued on March 24, 1980 for the use and operation of a 1.2 hectare waste disposal site having a maximum capacity of 51,240 cubic meters, being known as the Hibbert Landfill Site , as follows:*

**The following definitions are hereby added to the Certificate:**

**I. Definitions**

- a) "CAZ" means the contaminant attenuation zone;
- c) "Certificate" means this Provisional Certificate of Approval including all Notices of Amendment;
- d) "Director" means Director, Section 39, Environmental Protection act, R.S.O. 1990, C.E-19 as amended;
- e) "District Manager" means the District Manager in the London District Office, Southwestern Region, Ontario Ministry of the Environment;
- f) "EPA" means the Environmental Protection Act, R.S.O. 1990, C.E-19 as amended;
- g) "FBAL" means Fill Beyond Approved Limits;
- h) "Ministry" means the Ontario Ministry of the Environment;

- i) "Ontario Regulation 101/94" means Ontario Regulation 101/94 – Recycling and Composting of Municipal Waste, as made under the EPA;
- j) "Owner" means the Corporation of the Municipality of West Perth;
- k) "OWRA" mean the Ontario Water Resource Act, R.S.O 1990, Chapter O.40, as amended;
- l) "Reasonable Use Guideline" means the Ministry Guideline B-7 entitled "Incorporation of the Reasonable Use Concept into MOE Groundwater Management Activities, dated April 1994, as amended
- m) "Regulation 347" means Ontario Regulation 347 R.R.O. 1990, as amended; and
- n.) "Site" means the Hibbert Landfill Site.

## **2.0 General**

- 2.1. Except as otherwise provided by these conditions, the *Site* shall be designed, developed, used, maintained and operated, and all facilities, equipment and fixtures shall be built and installed, in accordance with the Conditions in the *Certificate* and the documentation, and plans and specifications listed in Schedule "A".
- 2.2. The requirements specified in this Provisional Certificate of Approval are the requirements under the **Environmental Protection Act**, R.S.O. 1990. The issuance of this Provisional Certificate of Approval in no way abrogates the *Owner* 's legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.
- 2.3. The requirements of this Provisional Certificate of Approval are severable. If any requirement of this Provisional Certificate of Approval, or the application of any requirement of this Provisional Certificate of Approval to any circumstance, is held invalid, the application of such requirement to other circumstances and the remainder of this Provisional Certificate of Approval shall not be affected in any way.
- 2.4. The *Owner* shall ensure compliance with all the terms and conditions of this Provisional Certificate of Approval. Any non-compliance constitutes a violation of the **Environmental Protection Act**, R.S.O. 1990 and is grounds for enforcement.
- 2.5. (a) The *Owner* shall, forthwith upon request of the *Director* , *District Manager* , or Provincial Officer (as defined in the Act), furnish any information requested by such persons with respect to compliance with this Provisional Certificate of Approval, including but not limited to, any records required to be kept under this Provisional Certificate of Approval; and
  - (b) In the event the Applicant provides the Ministry with information, records, documentation or notification in accordance with this Provisional Certificate of Approval (for the purposes of this

condition referred to as "Information"),

- (i) the receipt of Information by the Ministry;
- (ii) the acceptance by the Ministry of the Information's completeness or accuracy; or
- (iii) the failure of the Ministry to prosecute the *Owner*, or to require the *Owner* to take any action, under this Provisional Certificate of Approval or any statute or regulation in relation to the Information;

shall not be construed as an approval, excuse or justification by the Ministry of any act or omission of the *Owner* relating to the Information, amounting to non-compliance with this Provisional Certificate of Approval or any statute or regulation.

2.6. The *Owner* shall allow Ministry personnel, or a Ministry authorized representative(s), upon presentation of credentials, to:

- (a) carry out any and all inspections authorized by Section 156, 157 or 158 of the Environmental Protection Act, R.S.O. 1990, Section 15, 16 or 17 of the Ontario Water Resources Act, R.S.O. 1990, or Section 19 or 20 of the Pesticides Act, R.S.O. 1990, as amended from time to time, of any place to which this Provisional Certificate of Approval relates; and,

without restricting the generality of the foregoing, to:

- (b)
  - (i) enter upon the premises where the records required by the conditions of this Provisional Certificate of Approval are kept;
  - (ii) have access to and copy, at reasonable times, any records required by the conditions of this Provisional Certificate of Approval;
  - (iii) inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required by the conditions of this Provisional Certificate of Approval; and
  - (iv) sample and monitor at reasonable times for the purposes of assuring compliance with the conditions of this Provisional Certificate of Approval.

2.7. (a) Where there is a conflict between a provision of any document referred to in Schedule "A", and the conditions of this Provisional Certificate of Approval, the conditions in this Provisional Certificate of Approval shall take precedence; and

(b) Where there is a conflict between documents listed in Schedule "A", the document bearing the most recent date shall prevail.

2.8. The *Owner* shall ensure that all communications/correspondence made pursuant to this Provisional Certificate of Approval includes reference to the Provisional Certificate of Approval number.

2.9. The *Owner* shall notify the *Director* in writing of any of the following changes within thirty (30) days of

the change occurring:

- a) change of *Owner* or operator of the *Site* or both;
  - b) change of address of current owner or provide address of the new *Owner* ;
  - c) change of partners where the *Owner* or operator is or at any time becomes a partnership, and a copy of the most recent declaration filed under the **Business Names Act**, 1991 shall be included in the notification to the *Director* ;
  - d) any change of name of the corporation where the *Owner* or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" (form 1 or 2 of O. Reg. 182, Chapter C-39, R.R.O. 1990 as amended from time to time), filed under the **Corporations Information Act** shall be included in the notification to the *Director* ; and
  - e) change in directors or officers of the corporation where the *Owner* or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" as referred to in 2.9(d).
- 2.10. In the event of any change in ownership of the *Site* , the *Owner* shall notify, in writing, the succeeding owner of the existence of this Provisional Certificate of Approval, and a copy of such notice shall be forwarded to the *Director* .
- 2.11. Any information relating to this Provisional Certificate of Approval and contained in Ministry files may be made available to the public in accordance with the provisions of the **Freedom of Information and Protection of Privacy Act**, R.S.O. 1990, C. F-31.

### **3.0. Design and Operation**

- 3.1 The Site will ceased accepting waste for final disposal as of **March 28, 2009**.
- 3.2. Only municipal waste as defined in the *EPA* may be landfilled at the site. No liquid industrial waste or hazardous waste shall be disposed of at the landfill.
- 3.3. The site shall have a maximum theoretical volume capacity of **51,240 cubic meters**.
- 3.4. By no later than **April 10, 2009**, the *Owner* shall clearly stake the limit of the landfill;
- 3.5. A sign shall be posted in a prominent location at the *Site* entrance clearly stating the following:
  - i. *Owner* 's name;
  - ii. Operator's name;
  - iii. Provisional Certificate of Approval No.;
  - iv. Type of Waste Accepted
  - v. the hours of operation;
  - vi. Public access to the *Site* is prohibited during non-operational hours; and
  - vii. Contact telephone number to call with complaints or in the event of an

emergency.

- 3.6. (1) By no later than **December 12, 2009**, the *Owner* shall submit to the *District Manager*, a report that identifies areas around the perimeter of the landfill that require fencing to effectively limit unauthorized persons access to the landfill and identifies the type of fencing proposed
- (2) The *Owner* shall within **one-hundred and twenty (120) days** of being notified in writing by the *District Manager* that the proposed locations for fencing and type of fencing identified in the report required under Condition No. 3.7(1) is acceptable shall install perimeter fencing and post "No Trespassing" signs at 30 metre intervals in the proposed locations.
- 3.7. The *Owner* shall ensure that the entrance gate is locked and secured during non-operational hours.
- 3.8. (1) Soil cover material with a minimum thickness of 150 mm or an approved thickness of alternative cover material as approved by the Director shall be placed over the entire working face at the end of every operating week;
- (2) Intermediate Cover shall be placed in areas where landfilling has been temporarily discontinued for six (6) months or more. A minimum thickness of 300 mm of soil cover or an approved thickness of alternative cover material shall be placed.
- 3.9. i. The *Owner* shall undertake litter pick-up around the property in the early spring and late fall, including the fenceline and any surface water bodies on the property.
- ii. The *Owner* shall also undertake regularly scheduled litter pick-ups around the site between the months of May and September.
- 3.10. Vermin and vectors shall be adequately controlled at the Site by the *Owner*. In the event that the vermin and the vector population should increase and become a hazard, a licenced exterminator shall be engaged by the *Owner* at the necessary frequency to bring the problem under control.
- 3.11. (i) The *Owner* shall on a weekly basis conduct and document visual inspections of the landfill site for leachate outbreaks.
- (ii) Within one (1) week of an leachate outbreak being identified during the weekly inspections identified in Condition No. 3.16 (i), the *Owner* shall notify the District Office in writing of the occurrence and actions to be taken.
- 3.12. (i) Only clean wood and brush shall be permitted for burning. Burning of the materials shall be completed as per the Ministry of the Environment Guideline C-7 (Burning at Landfill Sites);

(ii) The clean wood/brush area shall be clearly marked with a sign(s) that prohibits the public from approaching the area when burning operations are occurring.

(iii) The *Owner* shall ensure there is a designated area for ash material.

3.13. Recyclable materials shall be properly separated and each area properly identified. The areas shall be kept in a neat and tidy manner;

3.14. All storage containers/bins used to store waste and/or recyclable materials shall be maintained in good condition to prevent leakage. The *Owner* shall immediately remove from service any leaking container. Containers/bins used to store clean scrap metal may be equipped with drainage holes to permit the drainage of rainwater;

#### **4.0. Spills**

4.1. All spills and upsets shall be immediately reported to the Ministry's Spills Action Centre (SAC) and shall be recorded in a log as to the nature of the spill or upset, and the action taken for clean-up, correction and prevention of future occurrences.

#### **5.0. Record Keeping**

5.1. The *Owner* shall establish and maintain a written record of daily operations at the *Site*. This record shall be in the form of a log or a dedicated electronic file and it shall include as a minimum the following information:

- a) date of record;
- b) hours of operation; and
- c) an approximation of the type, amount and source of waste received (ie. loads or vehicles/day).
- d) an estimate on the amount (depending on item i.e. in tonnes or number of tires, appliances, batteries) of recyclable materials received at the *Site*

5.2. The *Owner* shall establish and maintain a written record of all complaints received about the site and any environmental emergency situations that occur at the *Site*. This record shall be in the form of a log or a dedicated electronic file and it shall include, as a minimum, the following information:

- a) Date and time of occurrence
- b) type of the environmental emergency situation and the resulting environmental impact;
- c) name, address and telephone number of the complainant;
- d) actions taken to address the impact;
- e) actions taken to prevent the re-occurrence of a similar emergency situation in the future; and

- f) method of reporting the incident to the MOE District Office

5.3. The *Owner* shall establish and maintain a written record of the *Site* inspections. This record shall be in the form of a log or a dedicated electronic file and it shall include, as a minimum, the following information:

- a) date and time of inspection;
- b) name, title and signature of trained personnel conducting the inspection; and
- c) a listing of all equipment, fencing, signs, etc. inspected and any deficiencies observed; and
- d) recommendations for remedial action and the completion date of such action.

5.4. The *Owner* shall establish and maintain a written record of all occurrences of receipt of unacceptable waste at the *Site*. This record shall be in the form of a log or a dedicated electronic file and it shall include, as a minimum, the following information:

- a) waste generator;
- b) type of unacceptable waste;
- c) an estimate on the amount of unacceptable waste;
- d) nature of unacceptable waste;
- e) steps taken to remove waste;
- f) actions taken by the *Owner* to prevent recurrence.

5.5. The *Owner* shall retain at the Municipal Office for a minimum of two (2) years from the date of their creation, or longer if requested in writing by the *District Manager*, all records and information relating to or resulting from the activities approved under this Certificate, and shall make all records and information available at all times for inspection by a Provincial Officer.

#### **6.0. Environmental Monitoring Plan**

6.1. (1) By no later than **December 12, 2008**, the *Owner* shall submit to the *Director* for approval, with copies to the *District Manager*, a groundwater and surface water monitoring program for the site. When developing the environmental monitoring plan, the *Owner* shall consult with the *District Office* to discuss the location of the various monitoring stations. The plan shall include but not be limited to the following:

- i. a drawing showing the proposed sampling locations;
- ii. parameters that shall be analyzed;
- iii. the sampling frequency;
- iv. the groundwater measurement, flow measurement and sampling protocols;

(2) Once the Monitoring Plan required in Condition No. 7.1 is approved, the *Owner* can make changes to the monitoring program in accordance with the recommendations of the annual report provided that the *District Manager* agrees, in writing, to such changes to

the program.

## **7.0. Waste Volume Determination**

- 7.1. (i) By no later than **December 12, 2008**, and by every other December 12th thereafter, provided the *Site* has accepted waste between the time periods, until the *Site* is closed, the *Owner* shall complete a survey or retain a land surveyor to survey the contours of the landfill site for the purposes of determining the volume of material (waste, daily cover, etc) landfilled at the *Site* .
- (ii) The *Owner* , in conjunction with the Annual Report required under Condition No. (8.1), shall submit to the *District Manager* , with copies to the *Director* , a brief report that summarizes the survey. The information in the report shall include but not be limited to the following:
- i. whom performed the survey (ie. Municipality or the name of the survey company);
  - ii. a drawing(s) showing the existing contours and the base contours of the landfill;
  - iii. the calculated volume of waste at the *Site* ; and
  - iv. a description of how the calculated volume was derived.

## **8.0. Annual Reporting**

- 8.1. By no later than **December 12, 2008**, and by December 12th of every year thereafter, the *Owner* shall submit, to the *District Manager* , an annual *Site* operation, ground and surface water monitoring report prepared by a Professional Engineer or Professional Geoscientist. The report shall contain, but is not limited to, the following information:
- a) a summary of type and estimated quantity of incoming waste accepted during the reporting period;
  - b) a summary of total amount of waste received at the site, remaining capacity and remaining life expectancy of the site;
  - c) a summary of the site's operational procedures and an assessment of compliance with the Certificate requirements;
  - d) a summary of recycling operations;
  - e) a discussion and/or illustration on any changes that may have occurred in the current reporting period with regards to the landfill's hydrogeologic setting, potentially sensitive groundwater and/or surface water features or changes to the landfill. If no changes occur, then author shall reference appropriate Section(s) in previous reports to direct the reviewer to the existing information.
  - f) Sampling protocols, and a description of any problems encountered during the sampling events which may have impacted the reliability of analytical results;
  - g) The data shall be interpreted by the author(s) and presented in a manner that is acceptable

to the Director. All analytical results for all parameters shall be presented in tabular form. All analytical results for the critical contaminants must be compared to the trigger levels in accordance with the environmental contingency plan;

- h) The report shall identify the "Reasonable Use Criteria" (Guideline B-7) of the ground water at the site. The report should also identify expected and worst-case impacts;
- i) The report should include a comparison of the results of surface water sampling to the PWQOs or Interim PWQOs described in Water Management, MOEE, July 1994, as amended from time to time;
- j.) A discussion on the contaminant attenuation zone and buffer zone requirements;
- k.) QA/QC protocol must be described; and
- l.) The report shall have the conclusions and recommendations of the author(s), especially as they concern future sampling parameters, frequency and protocol.

## **9.0. Closure Plan**

9.1. By no later than **December 12, 2009**, the *Owner* shall submit to the *Director* for approval, with copies to the *District Manager*, a detailed site closure plan pertaining to the termination of landfilling operations at this *Site*, post-closure inspection, maintenance and monitoring, and end use, based on the Landfill Closure Section of the Design and Operations Report. The plan shall include the following:

- a. a plan showing the *Site* appearance after closure;
- b. a description of the proposed end use of the *Site* ;
- c. a descriptions of the procedures for closure of the *Site*, including:
  - i. advance notification of the public of the landfill closure;
  - ii. posting of a sign at the Site entrance indicating the landfill is closed and identifying any alternative waste disposal arrangements;
  - iii. completion, inspection and maintenance of the final cover and landscaping;
  - iv. site security;
  - v. removal of unnecessary landfill-related structures, buildings and facilities;
  - vi. final construction of any control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas; and
  - vii. a schedule indicating the time-period for implementing sub-conditions i) to vi) above.
- d. descriptions of the procedures for post-closure care of the Site, including:
  - i. operation, inspection and maintenance of the control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;
  - ii. record keeping and reporting; and

- iii. complaint contact and response procedures;
- e. an assessment of the adequacy of and need to implement the contingency plans for leachate and methane gas; and
- f. an updated estimate of the contaminating life span of the *Site* , based on the results of the monitoring programs to date.

9.2. The *Site* shall be closed in accordance with the closure plan as approved by the *Director*.

**Schedule "A"**

1. Letter report dated September 10, 2007 addressed to Mr. Bob Slivar, Ministry of the Environment from Mr. Lyle Parsons, R.J. Burnside and Associates. The letter report was entitled "Municipality of West Perth - Capacity Assessment of the Municipality's Landfill Sites".
2. Letter dated March 14, 2008 addressed to Mr. Dale Gable, Ministry of the Environment from Mr. Lyle Parsons, RJ Burnside and Associates providing a legal description plan (Plan 44R-4578).

**The reason(s) for this amendment to the Certificate of Approval is (are) as follows:**

1. *The reason for Conditions (2.1), (2.2), (2.3), (2.4), (2.5), (2.6), (2.7), (2.8), (2.9), (2.10) and (2.11) is to clarify the legal rights and responsibilities of the Owner.*
2. *The reason for Condition (3.1) is to identifying a site closure date as stated by the Owner into the Certificate.*
3. *The reason for Condition (3.2) is to clearly identify that only municipal waste may be landfilled at the Site.*
4. *The reason for Condition (3.3) is to identify the maximum capacity of the Site.*
5. *The reason for Condition (3.4) is to ensure the limits of the landfill are clearly identified for the Owner and the Ministry.*
6. *The reasons for Condition (3.5), (3.7), (3.8), (3.9), (3.11), (3.12), (3.13), and (3.14) are to ensure the landfill is operated in accordance with Ministry standards, and to ensure the long-term protection of the health and safety of the public and the environment.*
8. *The reason for Condition (3.6) is to ensure that areas where the public can access the site is fenced. This is to ensure that unauthorized access to the site does not occur.*
9. *The reasons for Condition (3.10) are to ensure the Owner conducts and documents inspections for leachate seepages around the landfill and to notify the District Office of potential tasks to be taken to address the seepages. This is to ensure seepages are addressed around the Site in order to protect the long term health and safety of the public and the environment.*
10. *The reasons for Condition (5.1), (5.2), (5.3), (5.4) and (5.5) are to ensure monitoring and reporting are completed in accordance with Ministry standards, and to ensure the long-term health and safety protection of the public and the environment.*
11. *The reason for Condition (6.1) is to ensure the Owner has an established environmental monitoring plan for the Site for the long term health and safety of the public and the environment.*
12. *The reason for Condition (7.1) is to ensure the Owner completes a survey to determine the volume of waste at the Site and can accurately determine the remaining life expectancy.*
13. *The reasons for Condition (8.1) are to ensure the Owner submits an annual summary report to the Ministry so that the landfilling operation can be evaluated to ensure compliance with the Ministry's requirements on annual operations and monitoring. This is to ensure the long-term protection of the health and safety of the public and the environment.*
14. *The reason for Conditions (9.1) and (9.2) is to ensure the Owner has an established approved plan for*

*the closure and post-closure maintenance of the landfill site. This is to ensure the long-term health and safety of the public and the environment.*

**This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A151301 dated March 24, 1980**

*In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:*

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

*The Notice should also include:*

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

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

*This Notice must be served upon:*

The Secretary\*  
Environmental Review Tribunal  
655 Bay Street, 15th Floor  
Toronto, Ontario  
MSG 1E5

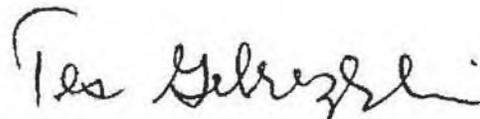
AND

The Director  
Section 39, *Environmental Protection Act*  
Ministry of the Environment  
2 St. Clair Avenue West, Floor 12A  
Toronto, Ontario  
M4V 1L5

\* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or [www.ert.gov.on.ca](http://www.ert.gov.on.ca)

*The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act.*

DATED AT TORONTO this 18th day of September, 2008



Tesfaye Gebrezghi, P.Eng.  
Director  
Section 39, *Environmental Protection Act*

DG/

c: District Manager, MOE London - District  
MOE Initiated, The Corporation of the Municipality of West Perth

**Appendix A-2**  
**Environmental Compliance Approval – Notice No.2**

**AMENDMENT TO PROVISIONAL CERTIFICATE OF  
APPROVAL****WASTE DISPOSAL SITE  
NUMBER A151301**

Notice No. 2

Issue Date: September 20, 2010

The Corporation of the Municipality of West Perth  
169 St. David St  
Post Office Box, No. 609  
Mitchell, Ontario  
N0K 1N0

Site Location: West Perth (Hibbert Landfill)  
Lot 22, Concession 9  
West Perth Municipality, County of Perth

*You are hereby notified that I have amended Provisional Certificate of Approval No. A151301 issued on March 24, 1980, as amended for the use and operation of a 1.2 hectares waste disposal site , as follows:*

**SITE CLOSURE PLAN**

Pursuant to Condition 3.1 in Notice #1 dated September 18 , 2008, the Provisional Certificate of Approval No. A151301, is hereby amended to reflect the status of the Hibbert Landfill Site as "closed", for the deposition of waste into the waste fill area for final disposal, as presented in a report entitled "The Municipality of West Perth Hibbert Landfill Closure Plan", dated January, 2010 (Revised), prepared by R. J. Burnside & Associates Limited, and the documentation listed below, which form part of Schedule "A" of the Certificate, and subject to the terms and conditions listed herein:

**DOCUMENTATION**

1. Report entitled "The Municipality of West Perth Hibbert Landfill Closure Plan, R. J. Burnside & Associates Limited", dated January, 2010 (Revised), prepared by R. J. Burnside & Associates Limited.
2. Letter dated October 22, 2009 from Kim Hawkes, R. J. Burnside & Associates Limited to Bob Slivar, Ministry of the Environment, regarding Hibbert Landfill Site, Response to MOE Comments dated May 5, 2009, Certificate of Approval No. A151301, (MOE Reference No. 4023-7UNQ2S).

3. Letter dated January 18, 2010 from Kent Hunter, R. J. Burnside & Associates Limited to Dickson Odame-Osafo, Ministry of the Environment, regarding Hibbert Landfill Closure Plan, Certificate of Approval No. A151301, MOE Reference No. 4023-7UNQ2S.

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

## **TERMS AND CONDITIONS**

### **1.0 Site Closure**

- 1.1 The Site is hereby acknowledged to be closed for deposition of waste into the waste fill area for final disposal, and closure works, including final capping, and post-closure care and monitoring for the Site, shall be completed in accordance with the Closure Plan, (Section 4.0 to 4.9), Item 1 in Schedule "A", as amended by letter dated January 18, 2010, Item 2 in Schedule "A", attached to this Certificate. Updates to the Closure Plan as appropriate, may be carried out and implemented, subject to a written concurrence in advance, by the District Manager, prior to the implementation.
- 1.2 The Owner shall carry out closure processes, including but not limited to removal of unwanted landfilling-related structures/buildings, waste fill area regrading to achieve the final contours ready to receive the final cover, improving site security/fencing to good working state, and shall follow complaints response protocol as described Section 7.0, Item 1 in Schedule "A", attached to this Certificate.

### **Final Cover**

- 1.3 The waste fill area shall be completely capped with a final cover soil, consisting of a base layer of 600 mm minimum thickness of native or imported soil, compacted in lifts, each lift not exceeding 250 mm in thickness, and overlain by 150 mm of top soil. As soon as practicable, the completed final cover shall be seeded to provide vegetative cover against erosion.
- 1.4 Subject to removal of organic soils within the base layer of 600 mm thickness, the final cover soil shall, as a minimum, meet the specifications described in Table 1 in Item 1, in Schedule "A", attached to this Certificate.
- 1.5 A maximum 1V:4H sideslopes, and a minimum 1V:20H drainage gradient in the flat areas of the waste fill area final cover, shall be maintained to help promote surface water runoff from the landfill mound, to the buffer areas.

### **2.0 Post-Closure Inspection/Maintenance**

- 2.1 The Owner shall ensure that the Site, including the final cover and general site features, is inspected, and maintained, as described in Item 1 (Sections 5.1 and 5.3) in Schedule "A", attached to this Certificate.
- 2.2 Where deficiencies exist or the integrity of the final cover, access gate, posted signs, fence, groundwater, surface water and landfill gas monitoring facilities and the like, is impaired, the

Owner shall carry out repairs promptly within a reasonable time period of first identification of the problem, and the results reported in the Post-Closure Care Report.

### **3.0 Post-Closure Monitoring Programs**

- 3.1. The Owner shall carry out monitoring programs for landfill gas, groundwater/leachate and surface water, as described in the Closure Plan (Appendix "C" - Environmental Monitoring Plan), Item 1 in Schedule "A", as amended by letters dated October 22, 2009 and January 18, 2010, listed as Items 2 and 3 respectively in Schedule "A", attached to this Certificate, and in accordance with any applicable legislation.
- 3.2. The Owner shall continue the existing water monitoring program at the Site shall ensure compliance with the Provincial Water Quality Objectives in respect of surface water, and shall be in compliance with the Ministry's Reasonable Use Guideline (Guideline B-7) with respect to groundwater.
- 3.3. Landfill gas (methane concentration and pressure) shall be monitored from appropriate gas monitoring probes at the Site, at least three times, during frozen ground conditions (i.e. December 1 through April 30).
- 3.4. A recommendation for proposed changes to the monitoring programs under this Certificate may be made in the annual monitoring reports, based on the results to date, and may be implemented subject to the prior written concurrence of the District Manager.
- 3.5. Any groundwater/leachate monitoring wells, or surface water monitoring points, or landfill gas monitoring probes, included in the monitoring program that get damaged or in any way made inoperable for sampling, shall be assessed, repaired, replaced or decommissioned, as the case may be, by the Owner.

#### **Subsurface Migration of Combustible Gas**

- 3.6. Subsurface migration of combustible methane gas shall meet the following:
  - (a) The concentration of methane gas below the ground surface at the Site boundary must be less than 2.5 per cent by volume;
  - (b) The concentration of methane gas in any on-Site building or enclosed structure, and in the area immediately outside the foundation or basement floor of any unvented building or structure, if the building or structure is accessible to any person or contains electrical equipment or a potential source of ignition, must be less than 1.0 per cent by volume;
  - (c) The concentration of methane gas from the Site in any off-Site building or enclosed structure, and in the area immediately outside the foundation or basement floor of the building or structure, must be less than 0.05 per cent by volume.

**Note:** For the purposes of Sub-Condition 3.6(b), vented building or structure is a building or structure

built with its floor sealed and elevated above ground and having adequate air space underneath the building or structure.

#### **4.0 Trigger Mechanisms and Contingency Plans**

- 4.1 The trigger Mechanism and contingency plan for groundwater/leachate, as described in the Closure Plan, (Appendix "D" - Environmental Contingency Plan), as amended by letters dated October 22, 2009 and January 18, 2010, listed as Items 2 and 3 respectively in Schedule "A", attached to this Certificate, shall be revised to include all leachate indicator parameters, except for parameters that are proven to be naturally elevated in concentration, and shall not be based on linear extrapolation of water chemistry data. The revised trigger mechanism and contingency plan shall be confirmed and accepted by the District Manager, through the review of annual monitoring reports.
- 4.2 In the event of a contaminant concentration exceeding acceptable levels, relating to leachate mounding or groundwater or surface water impacts due to leachate, the Owner shall notify the District Manager within two weeks of confirmed results, and an investigation into the cause, and proposed remedial or contingency action shall be submitted for the written acceptance of the District Manager.
- 4.3 The Owner shall implement the accepted remedial or contingency action as soon as practicable to address the problem.

#### **5.0 Record Keeping/Annual Post-Closure Reports**

- 5.1 Annual Post-Closure Report on the post-closure inspection/maintenance and monitoring of the Site, prepared by a qualified professional engineer, and based on Item 1 in Schedule "A", as amended by letter dated June October 22, 2009, listed as Item 2 in Schedule "A", attached to this Certificate, shall continue. The Post-Closure Report shall be submitted to the District Manager by **December 12 each year**, and shall cover the preceding calendar year. The Post-Closure Report shall include, but is not limited to the following:

(a) **Executive Summary or Equivalent:**

A summary of the findings, conclusions and recommendations.

(b). **Environmental Quality Monitoring:**

- i. a site plan showing changes to the monitoring network, if any;
- ii a description of the conditions at each surface water sampling location;
- iii. The results and interpretive analysis of the results of all groundwater/leachate, surface water and landfill gas monitoring programs, including an assessment of the need to amend the monitoring programs and trigger mechanisms or to implement contingency measures.
- iv. an assessment of the surface water quality in relation to Provincial Water Quality Objectives
- v. an assessment of the groundwater quality in relation to the Ministry's Reasonable Use

- Guidelines (RUG) and its impact on the receiving surface water body;
- vi. an assessment of the adequacy of the Buffer/Contaminant Attenuation Zone, and/or the need to implement contingency action;
  - vii. an assessment of the physical conditions of the monitoring points.

(c). **Post-Closure Inspection/Maintenance:**

- i. a site plan showing the status of the final cover, and any changes in the final cover resulting from post closure maintenance and repairs;
- ii. a description of any identified site deficiencies and remedial actions implemented;
- iii. a description of complaints procedure and a summary of the public complaints registered against the Site, and the Owner response and abatement action, if complaints are received;
- iv. a statement as to compliance with all the conditions of the Certificate of Approval
- v. any changes to the design and operations report that has been approved by the Director since the last Annual Post-Closure Report, and any other information with respect to the Site which the District Manager may require from time to time.

(d). **Recommendations:**

- i. Recommendations respecting any proposed changes to the monitoring program or repairs required to the monitoring network;
- ii. Recommendations respecting the requirement for any remedial works based on the environmental quality monitoring.

REASONS

The reasons for this amendment to the Certificate of Approval are as follows:

1. The reasons for approval of the Closure Plan and **Conditions 1.0, 2.0 and 3.0** are to acknowledge that the landfill site is closed, and to ensure that appropriate closure processes, including final capping, are followed, and the closed landfill site is inspected, maintained and monitored in an environmentally acceptable manner for the protection of the natural environment and public health and safety.
2. The reason for **Condition 4.0** is to provide for a mechanism which provides early warning of potential impact, to allow sufficient time to prepare and implement remedial action.
3. The reasons for **Condition 5.0** are to ensure that regular review of site maintenance and monitoring data are documented and any possible improvements to site monitoring programs are identified. An annual post-closure report is an important tool used in reviewing post-closure monitoring and maintenance activities, its effect or relationship to any nuisance or environmental impacts, and for helping to ensure that the landfill site continues to perform as designed. Post-closure care will be required for as long as contaminants from the site pose a potential concern to the natural environment. Record keeping is necessary to determine compliance with this Certificate of Approval, the EPA and its regulations.

**This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A151301 dated March 24, 1980**

*In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:*

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

*The Notice should also include:*

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

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

*This Notice must be served upon:*

The Secretary\*  
Environmental Review Tribunal  
655 Bay Street, 15th Floor  
Toronto, Ontario  
M5G 1E5

AND

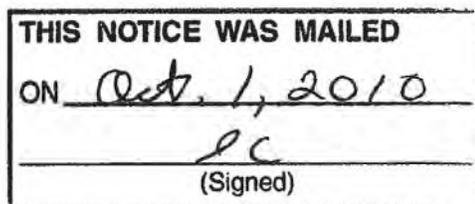
The Director  
Section 39, *Environmental Protection Act*  
Ministry of the Environment  
2 St. Clair Avenue West, Floor 12A  
Toronto, Ontario  
M4V 1L5

\* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the

Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or [www.ert.gov.on.ca](http://www.ert.gov.on.ca)

*The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act.*

DATED AT TORONTO this 20th day of September, 2010



*Tesfaye Gebrezghi*

Tesfaye Gebrezghi, P.Eng.  
Director  
Section 39, *Environmental Protection Act*

DO/

c: District Manager, MOE London - District  
Kent Hunter, R. J. Burnside & Associates Limited ✓

**APPENDIX B**  
**Borehole Logs and Test Pit Logs**

**Appendix B-1**  
**Borehole Logs**

# LOG OF DRILLING OPERATIONS

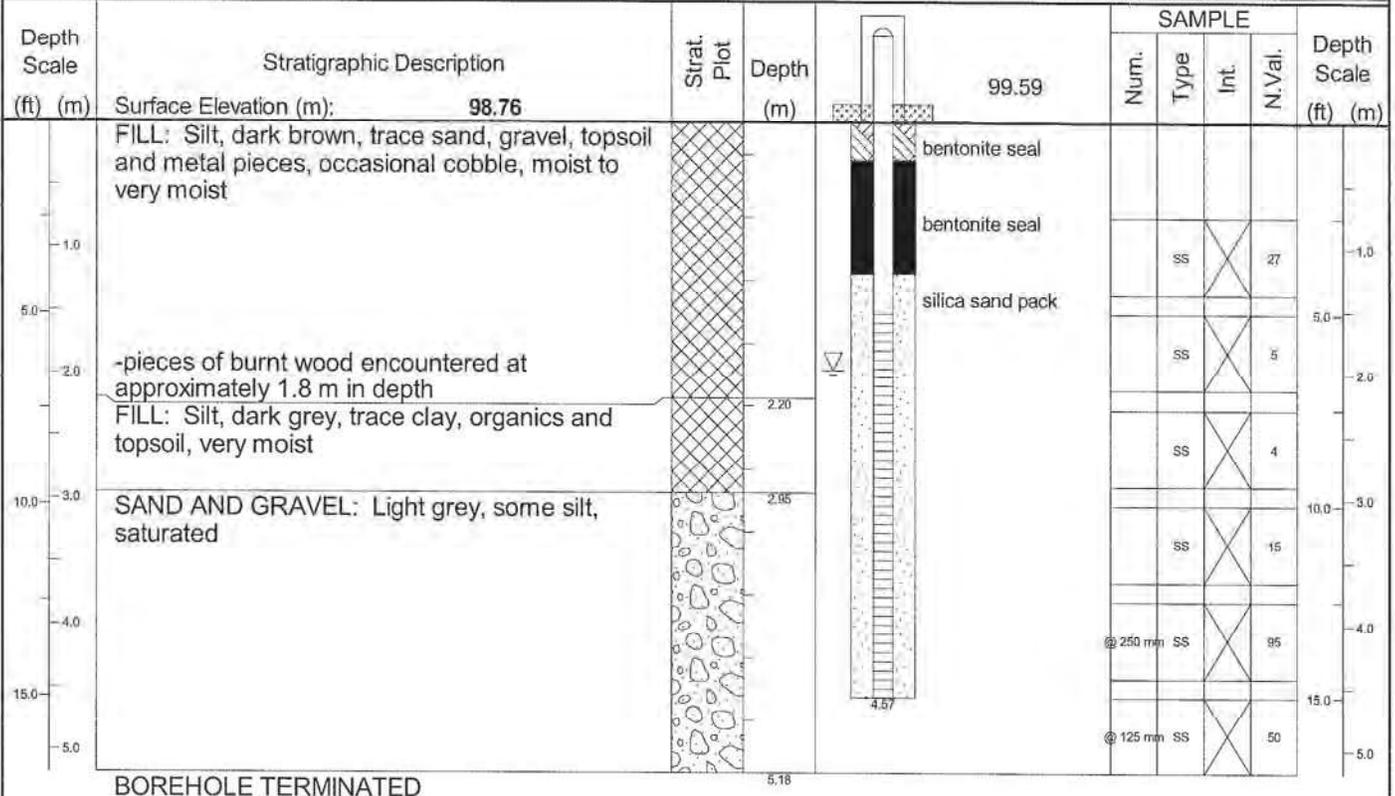
MW1

Page 1 of 1



R.J. Burnside & Associates Limited  
 16 Trowbridge, Perth, Western Australia  
 6150 Phone: 08 9441 8131 Fax: 08 9441 8120

Client: <b>Municipality of West Perth</b>	Project Name: <b>Hibbert Landfill</b>	Logged by: <b>C. Ostrowka</b>
Project No.: <b>MSO 10830.3</b>	Location: <b>7241 Perth Line 24, West Perth</b>	Ground (m amsl): <b>98.76</b>
Drilling Co.: <b>Lantech Drilling Services Inc.</b>	Date Started: <b>4/25/2006</b>	Static Water Level (m amsl): <b>96.79</b>
Drilling Method: <b>Hollow Stem Auger</b>	Date Completed: <b>4/25/2006</b>	Sand Pack (m amsl):



BOREHOLE TERMINATED

Prepared By: **C. Ostrowka** Checked By: **K. Hawkes** Date Prepared: **5/19/2006**

This borehole log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by R. J. Burnside & Associates Limited personnel before use by others.

**LEGEND**

- Water found @ time of drilling
- Static Water Level - 5/10/2006

**MONITORING WELL DATA**

Pipe: **51 mm dia. PVC**  
 Screen: **51 mm dia. PVC #10 slot**

**SAMPLE TYPE**

- AC [Solid black] Auger Cutting
- CS [Stippled] Continuous
- RC [Cross-hatch] Rock Core
- SS [X-pattern] Split Spoon
- AR [Diagonal lines] Air Rotary
- WC [Wavy lines] Wash Cuttings

B:\CG ORANGEVILLE\F\GINT4\1\GINT4-1\PROJECTS\10830\HIB.GPJ TEMPLATE.GDT 06/09/06

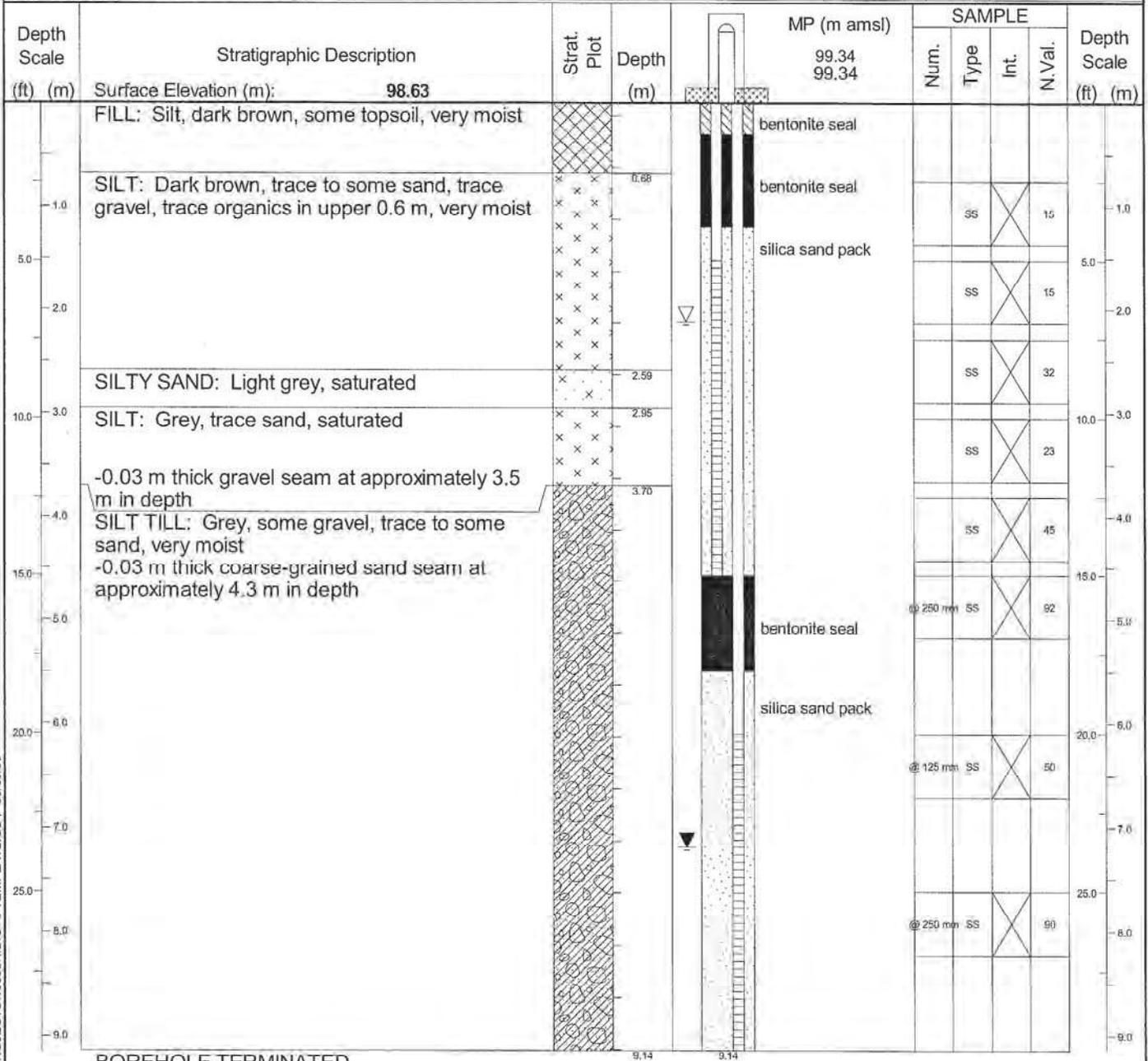


R. J. Burnside & Associates Limited  
 16 Tapscott, Perth, Western Australia  
 Tel: (08) 9441-5151 Fax: (08) 9441-5170

# LOG OF DRILLING OPERATIONS

MW2S&D

Client: Municipality of West Perth	Project Name: Hibbert Landfill	Logged by: C. Ostrowka
Project No.: MSO 10830.3	Location: 7241 Perth Line 24, West Perth	Ground (m amsl): 98.63
Drilling Co.: Lantech Drilling Services Inc.	Date Started: 4/26/2006	Static Water Level (m amsl): 96.49
Drilling Method: Hollow Stem Auger	Date Completed: 4/26/2006	Sand Pack (m amsl):



B:\LOG ORANGEVILLE\F\GINT4\_1\PROJECTS\10830\HIB.GPJ TEMPLATE\_GDT\_06/09/06

Prepared By: **C. Ostrowka** Checked By: **K. Hawkes** Date Prepared: **5/19/2006**

This borehole log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by R. J. Burnside & Associates Limited personnel before use by others.

<b>LEGEND</b> Water found @ time of drilling Static Water Level - 5/10/2006	<b>MONITORING WELL DATA</b> Pipe: 51 mm dia. PVC Screen: 51 mm dia. PVC #10 slot	<b>SAMPLE TYPE</b> AC  Auger Cutting CS  Continuous RC  Rock Core SS  Split Spoon AR  Air Rotary WC  Wash Cuttings
---	--	---

# LOG OF DRILLING OPERATIONS

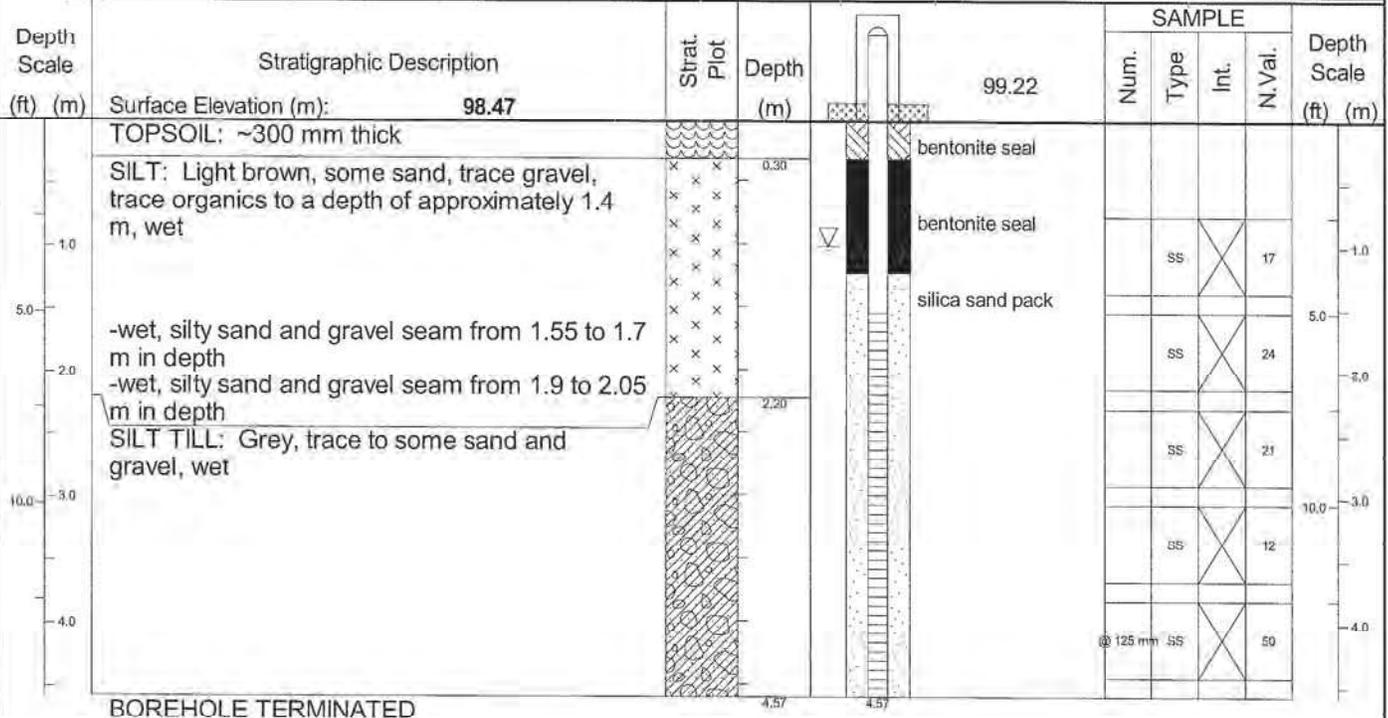
MW3

Page 1 of 1



R.J. Burnside & Associates Limited  
 16 Oranville, Orangeville, Ontario L9M 3Z9  
 Telephone: (416) 841-8121 Fax: (416) 841-8120

Client: <b>Municipality of West Perth</b>	Project Name: <b>Hibbert Landfill</b>	Logged by: <b>C. Ostrowka</b>
Project No.: <b>MSO 10830.3</b>	Location: <b>7241 Perth Line 24, West Perth</b>	Ground (m amsl): <b>98.47</b>
Drilling Co.: <b>Lantech Drilling Services Inc.</b>	Date Started: <b>4/26/2006</b>	Static Water Level (m amsl): <b>97.51</b>
Drilling Method: <b>Hollow Stem Auger</b>	Date Completed: <b>4/26/2006</b>	Sand Pack (m amsl):

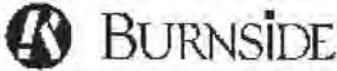


Prepared By: **C. Ostrowka** Checked By: **K. Hawkes** Date Prepared: **5/19/2006**

This borehole log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by R. J. Burnside & Associates Limited personnel before use by others.

<b>LEGEND</b> Water found @ time of drilling Static Water Level - 5/10/2006	<b>MONITORING WELL DATA</b> Pipe: <b>51 mm dia. PVC</b> Screen: <b>51 mm dia. PVC #10 slot</b>	<b>SAMPLE TYPE</b> AC  Auger Cutting CS  Continuous RC  Rock Core	SS  Split Spoon AR  Air Rotary WC  Wash Cuttings
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BHLOG ORANGEVILLE F:\GINT4-1\GINT4-1\PROJECTS\10830\HIB.GPJ TEMPLATE.GDT 06/09/06

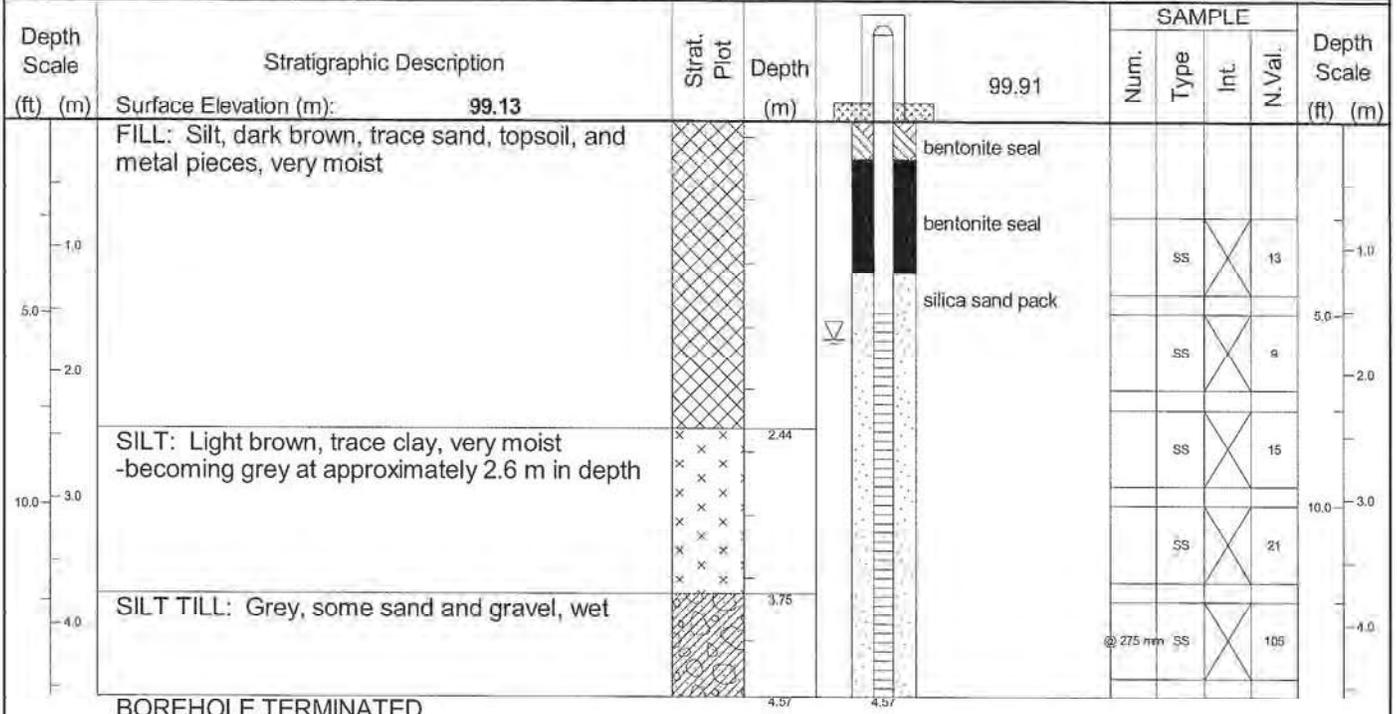


R.J. Burnside & Associates Limited  
 16, Tweedway, Orangeville, Ontario L9W 5M9  
 (416) 869-5194 (416) 869-5191 fax (519) 841-8170

# LOG OF DRILLING OPERATIONS

**MW4**

Client: <b>Municipality of West Perth</b>	Project Name: <b>Hibbert Landfill</b>	Logged by: <b>C. Ostrowka</b>
Project No.: <b>MSO 10830.3</b>	Location: <b>7241 Perth Line 24, West Perth</b>	Ground (m amsl): <b>99.13</b>
Drilling Co.: <b>Lantech Drilling Services Inc.</b>	Date Started: <b>4/26/2006</b>	Static Water Level (m amsl): <b>97.43</b>
Drilling Method: <b>Hollow Stem Auger</b>	Date Completed: <b>4/26/2006</b>	Sand Pack (m amsl):



BOREHOLE TERMINATED

Prepared By: **C. Ostrowka** Checked By: **K. Hawkes** Date Prepared: **5/19/2006**

This borehole log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by R. J. Burnside & Associates Limited personnel before use by others.

<b>LEGEND</b>	<b>MONITORING WELL DATA</b>	<b>SAMPLE TYPE</b>
<ul style="list-style-type: none"> <li>Water found @ time of drilling</li> <li>Static Water Level - 5/10/2006</li> </ul>	<ul style="list-style-type: none"> <li>Pipe: <b>51 mm dia. PVC</b></li> <li>Screen: <b>51 mm dia. PVC #10 slot</b></li> </ul>	<ul style="list-style-type: none"> <li>AC [Symbol] Auger Cutting</li> <li>CS [Symbol] Continuous</li> <li>RC [Symbol] Rock Core</li> <li>SS [Symbol] Split Spoon</li> <li>AR [Symbol] Air Rotary</li> <li>WC [Symbol] Wash Cuttings</li> </ul>

B:\LOG ORANGEVILLE\F\GINT4\1\PROJECTS\10830\HIB.GPJ TEMPLATE.GDT 06/09/06

# LOG OF DRILLING OPERATIONS

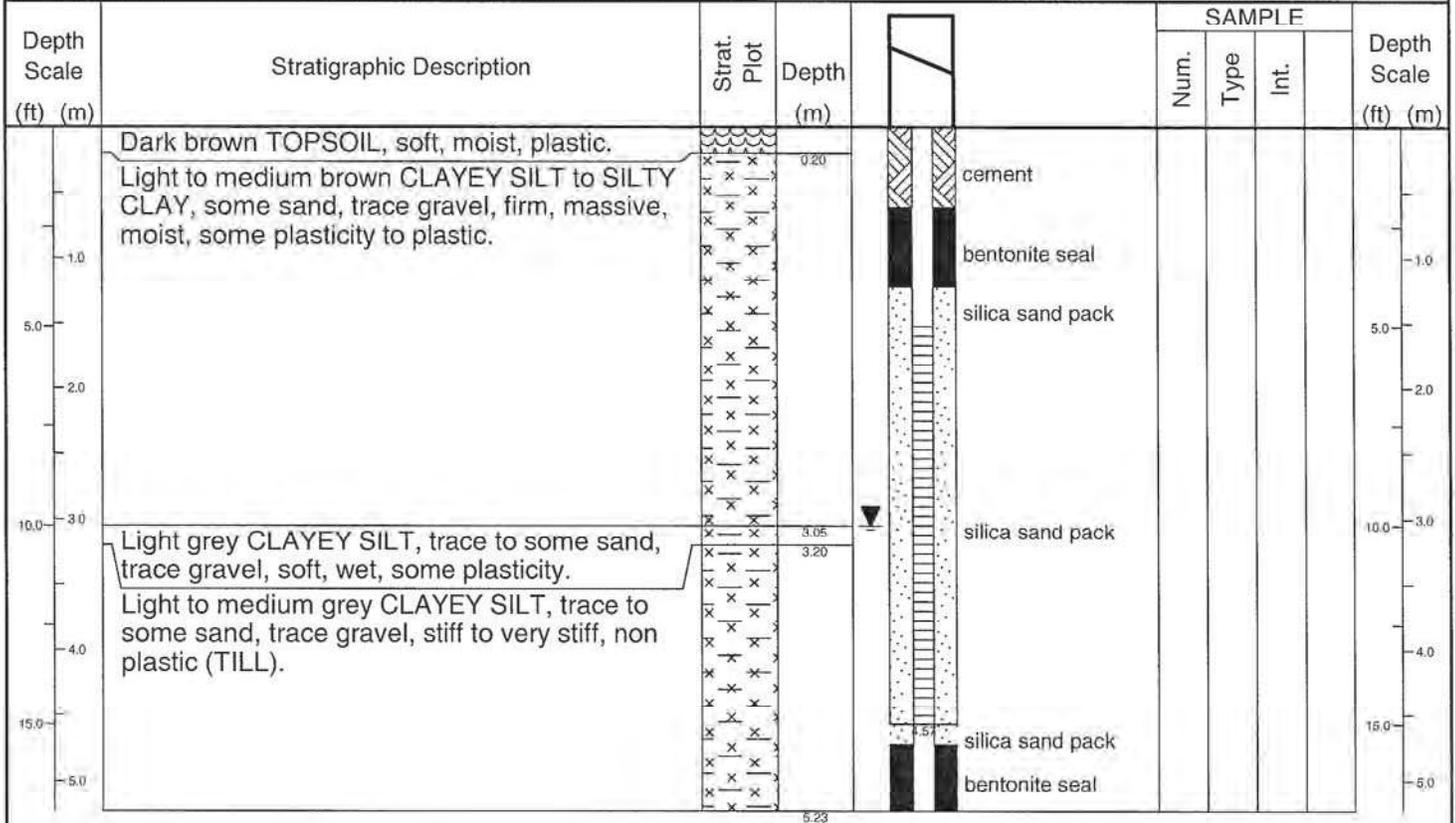


R.J. Burnside & Associates Limited  
 15 Townline, Orangeville, Ontario L9W 3R4  
 telephone (519) 841-5331 fax (519) 841-9120

**MW5s**

Page 1 of 1

Client: <b>Municipality of West Perth</b>	Project Name: <b>Hibbert Landfill</b>	Logged by: <b>D.Durham</b>
Project No.: <b>MSO 14315</b>	Location: <b>Hibbert Landfill, West Perth, ON</b>	Ground (m amsl):
Drilling Co.: <b>Lantech Drilling Services Inc.</b>	Date Started: <b>4/13/2010</b>	Static Water Level (m amsl):
Drilling Method: <b>Hollow Stem Auger</b>	Date Completed: <b>4/13/2010</b>	Sand Pack (m amsl):



Prepared By: **D. Durham**      Checked By: **K. Hawkes**      Date Prepared: **4/28/2010**

This borehole log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by R. J. Burnside & Associates Limited personnel before use by others.

**LEGEND**

▼ Water found @ time of drilling  
 ▽ Static Water Level -

**MONITORING WELL DATA**

Pipe: **51 mm dia. PVC**  
 Screen: **51 mm dia. PVC #10 slot**

**SAMPLE TYPE**

AC		Auger Cutting	SS		Split Spoon
CS		Continuous	AR		Air Rotary
RC		Rock Core	WC		Wash Cuttings

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# LOG OF DRILLING OPERATIONS



R.J. Burnside & Associates Limited  
 15 Townline, Orangeville, Ontario L9W 3R4  
 telephone (519) 941-5331 fax (519) 941-8120

MW5d

Client: <b>Municipality of West Perth</b>	Project Name: <b>Hibbert Landfill</b>	Logged by: <b>D.Durham</b>
Project No.: <b>MSO 14315</b>	Location: <b>Hibbert Landfill, West Perth, ON</b>	Ground (m amsl):
Drilling Co.: <b>Lantech Drilling Services Inc.</b>	Date Started: <b>4/14/2010</b>	Static Water Level (m amsl):
Drilling Method: <b>Hollow Stem Auger</b>	Date Completed: <b>4/14/2010</b>	Sand Pack (m amsl):

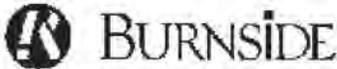
Depth Scale (ft) (m)	Stratigraphic Description	Strat. Plot	Depth (m)	Diagram	SAMPLE				Depth Scale (ft) (m)
					Num.	Type	Int.	N.Val.	
0.0 - 1.0	Dark brown TOPSOIL, soft, moist, plastic. Light to medium brown CLAYEY SILT to SILTY CLAY, some sand, trace gravel, firm, massive, moist, some plasticity to plastic.	[Symbol]	0.20	cement		SS	X	7	0.0 - 1.0
1.0 - 2.0		[Symbol]				SS	X	12	1.0 - 2.0
2.0 - 3.0		[Symbol]				SS	X	17	2.0 - 3.0
3.0 - 4.0		[Symbol]				SS	X	30	3.0 - 4.0
4.0 - 5.0	Light grey CLAYEY SILT, trace to some sand, trace gravel, soft, wet, some plasticity. Light to medium grey CLAYEY SILT, trace to some sand, trace gravel, stiff to very stiff, non plastic (TILL).	[Symbol]	3.05 3.20	bentonite seal		SS	X	25	4.0 - 5.0
5.0 - 6.0		[Symbol]				SS	X	41	5.0 - 6.0
6.0 - 7.0		[Symbol]				SS	X	39	6.0 - 7.0
7.0 - 8.0		[Symbol]				SS	X	60+	7.0 - 8.0
8.0 - 9.0	Medium grey SAND with some clay, trace silt and gravel, very stiff to hard, moist, non plastic (TILL).	[Symbol]	6.10	silica sand pack		SS	X	50+	8.0 - 9.0
9.0 - 10.0		[Symbol]				SS	X	53	9.0 - 10.0
10.0 - 11.0		[Symbol]				SS	X	53	10.0 - 11.0
11.0 - 12.0		[Symbol]				SS	X	65+	11.0 - 12.0
12.0 - 13.0		[Symbol]				SS	X	60+	12.0 - 13.0
13.0 - 14.0		[Symbol]				SS	X	60+	13.0 - 14.0
14.0 - 15.0		[Symbol]				SS	X	60+	14.0 - 15.0
15.0 - 16.0		[Symbol]				SS	X	60+	15.0 - 16.0
16.0 - 17.0		[Symbol]				SS	X	60+	16.0 - 17.0
17.0 - 18.0		[Symbol]				SS	X	60+	17.0 - 18.0
18.0 - 19.0		[Symbol]				SS	X	60+	18.0 - 19.0
19.0 - 20.0		[Symbol]				SS	X	60+	19.0 - 20.0
20.0 - 21.0		[Symbol]				SS	X	60+	20.0 - 21.0
21.0 - 22.0		[Symbol]				SS	X	60+	21.0 - 22.0
22.0 - 23.0		[Symbol]				SS	X	60+	22.0 - 23.0
23.0 - 24.0		[Symbol]				SS	X	60+	23.0 - 24.0
24.0 - 25.0		[Symbol]				SS	X	60+	24.0 - 25.0
25.0 - 26.0		[Symbol]				SS	X	60+	25.0 - 26.0
26.0 - 27.0		[Symbol]				SS	X	60+	26.0 - 27.0
27.0 - 28.0		[Symbol]				SS	X	60+	27.0 - 28.0
28.0 - 29.0		[Symbol]				SS	X	60+	28.0 - 29.0
29.0 - 30.0		[Symbol]				SS	X	60+	29.0 - 30.0
30.0 - 31.0		[Symbol]				SS	X	60+	30.0 - 31.0
31.0 - 32.0		[Symbol]				SS	X	60+	31.0 - 32.0
32.0 - 33.0		[Symbol]				SS	X	60+	32.0 - 33.0
33.0 - 34.0		[Symbol]				SS	X	60+	33.0 - 34.0
34.0 - 35.0		[Symbol]				SS	X	60+	34.0 - 35.0
35.0 - 36.0		[Symbol]				SS	X	60+	35.0 - 36.0
36.0 - 37.0		[Symbol]				SS	X	60+	36.0 - 37.0
37.0 - 38.0		[Symbol]				SS	X	60+	37.0 - 38.0
38.0 - 39.0		[Symbol]				SS	X	60+	38.0 - 39.0
39.0 - 40.0		[Symbol]				SS	X	60+	39.0 - 40.0
40.0 - 41.0		[Symbol]				SS	X	60+	40.0 - 41.0
41.0 - 42.0		[Symbol]				SS	X	60+	41.0 - 42.0
42.0 - 43.0		[Symbol]				SS	X	60+	42.0 - 43.0
43.0 - 44.0		[Symbol]				SS	X	60+	43.0 - 44.0
44.0 - 45.0		[Symbol]				SS	X	60+	44.0 - 45.0
45.0 - 46.0		[Symbol]				SS	X	60+	45.0 - 46.0
46.0 - 47.0		[Symbol]				SS	X	60+	46.0 - 47.0
47.0 - 48.0		[Symbol]				SS	X	60+	47.0 - 48.0
48.0 - 49.0		[Symbol]				SS	X	60+	48.0 - 49.0
49.0 - 50.0		[Symbol]				SS	X	60+	49.0 - 50.0
50.0 - 51.0		[Symbol]				SS	X	60+	50.0 - 51.0
51.0 - 52.0		[Symbol]				SS	X	60+	51.0 - 52.0
52.0 - 53.0		[Symbol]				SS	X	60+	52.0 - 53.0
53.0 - 54.0		[Symbol]				SS	X	60+	53.0 - 54.0
54.0 - 55.0		[Symbol]				SS	X	60+	54.0 - 55.0
55.0 - 56.0		[Symbol]				SS	X	60+	55.0 - 56.0
56.0 - 57.0		[Symbol]				SS	X	60+	56.0 - 57.0
57.0 - 58.0		[Symbol]				SS	X	60+	57.0 - 58.0
58.0 - 59.0		[Symbol]				SS	X	60+	58.0 - 59.0
59.0 - 60.0		[Symbol]				SS	X	60+	59.0 - 60.0
60.0 - 61.0		[Symbol]				SS	X	60+	60.0 - 61.0
61.0 - 62.0		[Symbol]				SS	X	60+	61.0 - 62.0
62.0 - 63.0		[Symbol]				SS	X	60+	62.0 - 63.0
63.0 - 64.0		[Symbol]				SS	X	60+	63.0 - 64.0
64.0 - 65.0		[Symbol]				SS	X	60+	64.0 - 65.0
65.0 - 66.0		[Symbol]				SS	X	60+	65.0 - 66.0
66.0 - 67.0		[Symbol]				SS	X	60+	66.0 - 67.0
67.0 - 68.0		[Symbol]				SS	X	60+	67.0 - 68.0
68.0 - 69.0		[Symbol]				SS	X	60+	68.0 - 69.0
69.0 - 70.0		[Symbol]				SS	X	60+	69.0 - 70.0
70.0 - 71.0		[Symbol]				SS	X	60+	70.0 - 71.0
71.0 - 72.0		[Symbol]				SS	X	60+	71.0 - 72.0
72.0 - 73.0		[Symbol]				SS	X	60+	72.0 - 73.0
73.0 - 74.0		[Symbol]				SS	X	60+	73.0 - 74.0
74.0 - 75.0		[Symbol]				SS	X	60+	74.0 - 75.0
75.0 - 76.0		[Symbol]				SS	X	60+	75.0 - 76.0
76.0 - 77.0		[Symbol]				SS	X	60+	76.0 - 77.0
77.0 - 78.0		[Symbol]				SS	X	60+	77.0 - 78.0
78.0 - 79.0		[Symbol]				SS	X	60+	78.0 - 79.0
79.0 - 80.0		[Symbol]				SS	X	60+	79.0 - 80.0
80.0 - 81.0		[Symbol]				SS	X	60+	80.0 - 81.0
81.0 - 82.0		[Symbol]				SS	X	60+	81.0 - 82.0
82.0 - 83.0		[Symbol]				SS	X	60+	82.0 - 83.0
83.0 - 84.0		[Symbol]				SS	X	60+	83.0 - 84.0
84.0 - 85.0		[Symbol]				SS	X	60+	84.0 - 85.0
85.0 - 86.0		[Symbol]				SS	X	60+	85.0 - 86.0
86.0 - 87.0		[Symbol]				SS	X	60+	86.0 - 87.0
87.0 - 88.0		[Symbol]				SS	X	60+	87.0 - 88.0
88.0 - 89.0		[Symbol]				SS	X	60+	88.0 - 89.0
89.0 - 90.0		[Symbol]				SS	X	60+	89.0 - 90.0
90.0 - 91.0		[Symbol]				SS	X	60+	90.0 - 91.0
91.0 - 92.0		[Symbol]				SS	X	60+	91.0 - 92.0
92.0 - 93.0		[Symbol]				SS	X	60+	92.0 - 93.0
93.0 - 94.0		[Symbol]				SS	X	60+	93.0 - 94.0
94.0 - 95.0		[Symbol]				SS	X	60+	94.0 - 95.0
95.0 - 96.0		[Symbol]				SS	X	60+	95.0 - 96.0
96.0 - 97.0		[Symbol]				SS	X	60+	96.0 - 97.0
97.0 - 98.0		[Symbol]				SS	X	60+	97.0 - 98.0
98.0 - 99.0		[Symbol]				SS	X	60+	98.0 - 99.0
99.0 - 100.0		[Symbol]				SS	X	60+	99.0 - 100.0

Prepared By: **D. Durham** Checked By: **K. Hawkes** Date Prepared: **4/28/2010**  
 This borehole log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by R. J. Burnside & Associates Limited personnel before use by others.

<b>LEGEND</b>	<b>MONITORING WELL DATA</b>	<b>SAMPLE TYPE</b>	AC [Symbol] Auger Cutting	SS [Symbol] Split Spoon
[Symbol] Water found @ time of drilling	Pipe: 51 mm dia. PVC	CS [Symbol] Continuous	AR [Symbol] Air Rotary	WC [Symbol] Wash Cuttings
[Symbol] Static Water Level -	Screen: 51 mm dia. PVC #10 slot	RC [Symbol] Rock Core		

B:\LOG QUEL PH P:\GINTY\PROJECTS\MMMSO14315.GPJ TEMPLATE.GDT 1/9/10

**Appendix B-2**  
**Test Pit Logs**



B. J. Burnside & Associates Limited  
 237 Spadina Avenue, West Tower, Toronto, Ontario M1T 1C2  
 telephone: (513) 623-1606 fax: (513) 626-5773

Client: Municipality of West Perth Project: Hibbert Landfill  
 Project No.: MSO 10830.3 Location: 7241 Perth Line 24, West Perth Supervised by: C. Ostrowka  
 Contractor: Municipality of West Perth Excavation Method: Rubber-tire backhoe  
 Test Pit Location: \_\_\_\_\_ Date Started: May 8, 2006 Date Completed: May 8, 2006

Depth Scale (ft) (m)	Stratigraphic Description	Stratigraphic Plot	Depth (m)	SAMPLE				Depth Scale (ft) (m)
				Name	Type	W.L.	GSDC	
0.0	TOPSOIL: ~100 mm thick		0.1					0.0
0.2	FILL: Silty sand, brown, some gravel, moist		0.45					0.2
1.0								1.0
2.0	FILL: Domestic refuse consisting of primarily silt, and burnt wood, metal, plastic, ash, black, moist							2.0
3.0								3.0
4.0	-becoming wet @ approximately 1.2 m in depth					1.3		4.0
5.0								5.0
6.0								6.0
7.0								7.0
8.0								8.0
9.0								9.0
10.0								10.0
3.2	TEST PIT TERMINATED DUE TO SLOUGHING		3.2					3.2

Prepared By: C. Ostrowka Checked By: K. Hawkes Date Prepared: June 1, 2006

This test pit log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test pit data requires interpretation by Burnside Environmental personnel before use by others.

LEGEND

- Water found
- GSDC - Grain size distribution curve available (Y/N)

SAMPLE TYPE

- GS - Grab Sample
- SS - Split Spoon
- AC - Auger Cuttings
- CS - Composite Sample
- ST - Shelby Tube
- WC - Wash Cuttings

TPLOG P:\GINT\PROJECTS\ORANGE-1110830\HP.GPJ TESTPIT.GDT 23/03/07



B.J. Burnside & Associates, Ltd.  
 297 Spadina Avenue, West Tower, Toronto, ON M5T 1C2  
 Telephone: (416) 823-4595 Fax: (416) 826-5777

Client: Municipality of West Perth Project: Hibbert Landfill  
 Project No.: MSO 10830.3 Location: 7241 Perth Line 24, West Perth Supervised by: C. Ostrowka  
 Contractor: Municipality of West Perth Excavation Method: Rubber-tire backhoe  
 Test Pit Location: \_\_\_\_\_ Date Started: May 8, 2006 Date Completed: May 8, 2006

Depth Scale (ft) (m)	Stratigraphic Description	Stratigraphic Plot	Depth (m)	SAMPLE				Depth Scale (ft) (m)
				Name	Type	W.L.	GSDC	
0.2 1.0 0.4 2.0 0.6 3.0 1.0 4.0 1.2 5.0 1.6 6.0 1.8 2.0	FILL: Silty sand, brown, some gravel, moist		0.6					0.2 1.0 0.4 2.0 0.6 3.0 1.0 4.0 1.2 5.0 1.6 6.0 1.8 2.0
	FILL: Domestic refuse consisting of primarily silt, and burnt wood, metal, plastic, ash, black, moist		2.13					

TEST PIT TERMINATED DUE TO SLOUGHING

Prepared By: C. Ostrowka Checked By: K. Hawkes Date Prepared: June 1, 2006

This test pit log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test pit data requires interpretation by Burnside Environmental personnel before use by others.

LEGEND

- Water found
- GSDC - Grain size distribution curve available (Y/N)

SAMPLE TYPE

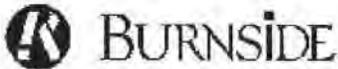
- GS - Grab Sample
- SS - Split Spoon
- AC - Auger Cuttings
- CS - Composite Sample
- ST - Shelby Tube
- WC - Wash Cuttings

TPLOG P:\GINT\PROJECTS\ORANGE-1\10830HTP.GPJ TESTPIT.GDT 23/03/07

# Test Pit Log

Page 1 of 1

**TP3**



B.J. Burnside & Associates Limited  
 237 Spence Avenue West, Fridley, Ontario M1H 1C2  
 telephone: (519) 823-4595 fax: (519) 836-5777

Client: Municipality of West Perth Project: Hibbert Landfill  
 Project No.: MSO 10830.3 Location: 7241 Perth Line 24, West Perth Supervised by: C. Ostrowka  
 Contractor: Municipality of West Perth Excavation Method: Rubber-tire backhoe  
 Test Pit Location: \_\_\_\_\_ Date Started: May 8, 2006 Date Completed: May 8, 2006

Depth Scale (ft) (m)	Stratigraphic Description	Stratigraphic Plot	Depth (m)	SAMPLE				Depth Scale (ft) (m)
				Name	Type	W.L.	GSDC	
0.2 1.0 0.4	FILL: Silty sand, dark brown, some gravel, trace topsoil, moist		0.6					0.2 1.0 0.4
2.0 0.6 0.8 3.0 1.0 4.0 1.2 5.0 1.4 6.0 1.6	FILL: Domestic refuse consisting of primarily silt, and burnt wood, metal, plastic, ash, black, moist							2.0 0.6 0.8 3.0 1.0 4.0 1.2 5.0 1.4 6.0 1.6
TEST PIT TERMINATED DUE TO SLOUGHING								

Prepared By: C. Ostrowka Checked By: K. Hawkes Date Prepared: June 1, 2006

This test pit log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test pit data requires interpretation by Burnside Environmental personnel before use by others.

**LEGEND**

- Water found
- GSDC - Grain size distribution curve available (Y/N)

**SAMPLE TYPE**

- GS - Grab Sample
- SS - Split Spoon
- AC - Auger Cuttings
- CS - Composite Sample
- ST - Shelby Tube
- WC - Wash Cuttings

TPLOG P:\GINT\PROJECTS\ORANGE-1\10830\HTP.GPJ TESTPIT.GDT 23/03/07

# Test Pit Log

Page 1 of 1

**TP4**



H.J. Burnside & Associates, Inc. Limited  
 292 Spadina Avenue, Suite 2000, Toronto, Ontario M 5T 1C4  
 telephone: (416) 823-1500 fax: (416) 823-5777

Client: Municipality of West Perth Project: Hibbert Landfill  
 Project No.: MSO 10830.3 Location: 7241 Perth Line 24, West Perth Supervised by: C. Ostrowka  
 Contractor: Municipality of West Perth Excavation Method: Rubber-tire backhoe  
 Test Pit Location: \_\_\_\_\_ Date Started: May 8, 2006 Date Completed: May 8, 2006

Depth Scale (ft) (m)	Stratigraphic Description	Stratigraphic Plot	Depth (m)	SAMPLE				Depth Scale (ft) (m)
				Name	Type	W.L.	GSDC	
0.2 1.0 0.4 2.0 0.6 3.0 0.8 4.0 1.0 5.0 1.2 6.0 1.4 7.0 1.6 8.0 1.8 9.0 2.0 10.0 2.2	FILL: Silt, dark brown, trace to some topsoil, trace sand and gravel, moist to very moist  -becoming dark gray at approximately 0.9 m in depth		2.13			▼ 1.83		0.2 1.0 0.4 2.0 0.6 3.0 0.8 4.0 1.0 5.0 1.2 6.0 1.4 7.0 1.6 8.0 1.8 9.0 2.0 10.0 2.2
7.0 2.2 8.0 2.4 9.0 2.6 10.0 2.8 3.0	FILL: Domestic refuse consisting of primarily silt, metal, and glass, dark grey, strong odour, saturated		3.05					7.0 2.2 8.0 2.4 9.0 2.6 10.0 2.8 3.0
TEST PIT TERMINATED DUE TO SLOUGHING								

Prepared By: C. Ostrowka Checked By: K. Hawkes Date Prepared: June 1, 2006

This test pit log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test pit data requires interpretation by Burnside Environmental personnel before use by others.

**LEGEND**

- ▼ Water found
- GSDC - Grain size distribution curve available (Y/N)

**SAMPLE TYPE**

- GS - Grab Sample
- SS - Split Spoon
- AC - Auger Cuttings
- CS - Composite Sample
- ST - Shelby Tube
- WC - Wash Cuttings

TPLOG P:\GINT\PROJECTS\DRANGE-1\10830HTP.GPJ TESTPIT.GDT 23/03/07



B.J. Burnside & Associates Limited  
 237 Spadina Avenue, West Tower, Toronto, Ontario M1T 1C2  
 telephone: (519) 823-4985 fax: (519) 836-2777

Client: Municipality of West Perth Project: Hibbert Landfill  
 Project No.: MSO 10830.3 Location: 7241 Perth Line 24, West Perth Supervised by: C. Ostrowka  
 Contractor: Municipality of West Perth Excavation Method: Rubber-tire backhoe  
 Test Pit Location: \_\_\_\_\_ Date Started: May 8, 2006 Date Completed: May 8, 2006

Depth Scale (ft) (m)	Stratigraphic Description	Stratigraphic Plot	Depth (m)	SAMPLE				Depth Scale (ft) (m)
				Name	Type	W.L.	GSDC	
0.2 1.0 0.4 2.0 0.6 3.0 0.8 5.0 1.0 4.0 1.2 5.0 1.4 6.0 1.6 7.0 1.8 8.0 2.0 2.2 2.4 2.6	FILL: Silt, dark brown, some topsoil, trace sand and gravel, occasional metal pieces, very moist							0.2 1.0 0.4 2.0 0.6 3.0 0.8 5.0 1.0 4.0 1.2 5.0 1.4 6.0 1.6 7.0 1.8 8.0 2.0 2.2 2.4 2.6
	SILT: Brown, very moist		1.83					
	SAND AND GRAVEL: Greyish brown, saturated		2.13			▼ 2.13		
	TEST PIT TERMINATED		2.74					

Prepared By: C. Ostrowka Checked By: K. Hawkes Date Prepared: June 1, 2006

This test pit log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test pit data requires interpretation by Burnside Environmental personnel before use by others.

LEGEND

- ▼ Water found
- GSDC - Grain size distribution curve available (Y/N)

SAMPLE TYPE

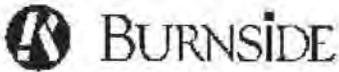
- GS - Grab Sample
- SS - Split Spoon
- AC - Auger Cuttings
- CS - Composite Sample
- ST - Shelby Tube
- WC - Wash Cuttings

TPLOG P:\GINT\PROJECTS\ORANGE-11\0830\HTP.GPJ TESTPIT.GDT 23/03/07

# Test Pit Log

Page 1 of 1

**TP6**



H.J. Burnside & Associates Limited  
 287 Spadina Avenue, West Tower, Ontario M1T 1C2  
 telephone: (513) 823-4595 fax: (513) 836-5777

Client: Municipality of West Perth Project: Hibbert Landfill  
 Project No.: MSO 10830.3 Location: 7241 Perth Line 24, West Perth Supervised by: C. Ostrowka  
 Contractor: Municipality of West Perth Excavation Method: Rubber-tire backhoe  
 Test Pit Location: \_\_\_\_\_ Date Started: May 8, 2006 Date Completed: May 8, 2006

Depth Scale (ft) (m)	Stratigraphic Description	Stratigraphic Plot	Depth (m)	SAMPLE				Depth Scale (ft) (m)
				Name	Type	W.L.	GSDC	
0.2 1.0 0.4 2.0 0.6 3.0 0.8 4.0 1.2	FILL: Silt, dark brown, occasional cobbles and metal pieces, moist		1.22					0.2 1.0 0.4 2.0 0.6 3.0 0.8 4.0 1.2
1.4 5.0 1.6 6.0 1.8 7.0 2.0 8.0 2.2 2.4	FILL: Domestic refuse consisting primarily of silt, corroded metal and glass, brown, saturated		2.59			▼ 1.52		1.4 5.0 1.6 6.0 1.8 7.0 2.0 8.0 2.2 2.4

TEST PIT TERMINATED DUE TO SLOUGHING

Prepared By: C. Ostrowka Checked By: K. Hawkes Date Prepared: June 1, 2006

This test pit log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test pit data requires interpretation by Burnside Environmental personnel before use by others.

**LEGEND**

- ▼ Water found
- GSDC - Grain size distribution curve available (Y/N)

**SAMPLE TYPE**

- GS - Grab Sample
- SS - Split Spoon
- AC - Auger Cuttings
- CS - Composite Sample
- ST - Shelby Tube
- WC - Wash Cuttings

TPLOG P:\GINT\PROJECTS\ORANGE-110830\HTP.GPJ TESTPIT.GDT 23/03/07

**APPENDIX C**  
**Groundwater Level Elevations**

**Table C-1**  
**Groundwater Level Elevations**

**TABLE C-1**  
**GROUNDWATER LEVEL ELEVATIONS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Monitoring Well	MW1	MW2S	MW2D	MW3	MW4	MW5S	MW5D
Measuring Point Elevation <sup>1</sup> (mASL)	311.72	311.51	311.49	311.34	312.02	312.45	312.59
Measure Point Elevation <sup>2</sup> (mASL)	313.19	311.51	311.49	311.34	313.54	312.45	312.59
Measure Point Elevation <sup>3</sup> (mASL)	312.95	311.51	311.49	311.34	313.57	312.45	312.59
<b>Water Level Elevations (mBTOP)</b>							
09-May-06	2.8	2.85	7.84	1.71	2.48		
22-May-07	2.85	2.84	4.01	1.7	2.48		
25-Jun-08	2.91	2.84	3.99	1.59	2.56		
20-May-09	2.83	2.77	3.81	1.55	2.40		
10-May-10	2.45	2.51	3.74	1.11	2.38	1.43	2.52
25-May-11	3.96	2.6	3.41	1.13	3.83	1.59	2.67
14-May-12	4.25	2.85	3.71	2	4.05	2.25	3.28
25-Apr-13	3.39	2.36	3.05	0.92	1.63	1.6	2.57
20-May-14	3.62	2.8	3.38	1.47	2.41	1.94	2.31
21-May-15	3.78	2.57	3.4	1.71	3.95	1.98	3.15
13-May-16	3.82	2.62	3.53	1.65	3.86	1.97	3.09
04-May-17	3.34	2.2	3.32	1.02	3.30	1.47	2.57
19-May-19	3.44	2.25	3.63	0.97	3.41	1.51	2.63
28-Apr-20	3.97	2.79	3.84	1.66	3.80	1.97	3.11
03-May-21	3.98	2.80	3.75	1.70	3.38	1.92	3.10
03-May-22	3.79	2.66	3.59	1.47	3.71	1.82	2.92
02-May-23	3.83	2.69	3.67	1.51	3.75	1.78	2.91
13-May-24	3.79	2.63	3.68	1.62	3.77	1.79	2.91
06-May-25	3.89	2.78	3.81	1.65	3.90	1.97	3.03
<b>Water Level Elevations (mASL)</b>							
09-May-06	308.92	308.66	303.65	309.63	309.54		
22-May-07	308.87	308.67	307.48	309.64	309.54		
25-Jun-08	308.81	308.67	307.50	309.75	309.46		
20-May-09	308.89	308.74	307.68	309.79	309.62		
10-May-10	309.27	309.00	307.75	310.23	309.64	311.02	310.07
25-May-11	307.76	308.91	308.08	310.21	308.19	310.86	309.92
14-May-12	308.94	308.66	307.78	309.34	309.49	310.20	309.31
25-Apr-13	309.56	309.15	308.44	310.42	311.94	310.85	310.02
20-May-14	309.33	308.71	308.11	309.87	311.16	310.51	310.28
21-May-15	309.17	308.94	308.09	309.63	309.62	310.47	309.44
13-May-16	309.13	308.89	307.96	309.69	309.71	310.48	309.50
04-May-17	309.61	309.31	308.17	310.32	310.27	310.98	310.02
19-May-19	309.51	309.26	307.86	310.37	310.16	310.94	309.96
28-Apr-20	308.98	308.72	307.65	309.68	309.77	310.48	309.48
03-May-21	308.97	308.71	307.74	309.64	310.19	310.53	309.49
03-May-22	309.16	308.85	307.90	309.87	309.86	310.63	309.67
02-May-23	309.12	308.82	307.82	309.83	309.82	310.67	309.68
13-May-24	309.16	308.88	307.81	309.72	309.80	310.66	309.68
06-May-25	309.06	308.73	307.68	309.69	309.67	310.48	309.56

1. The elevations were surveyed on July 16, 2008, with the exception of MW5S and MW5D (surveyed on September 7, 2010), by others.

Notes: 2. The Site was graded in 2011 and the pipes at MW1 and MW4 were extended. The top of pipes were surveyed in September 2011.

3. Following the installation of protective casings at MW1 and MW4, the pipes were then cut to fit the casings and the wells were resurveyed in August 2012. The total well depths at MW1 and MW4 were adjusted to match pipe extensions.

4. Benchmark - All elevations were measured relative to the top of the protective steel casing at MW4 (assumed to be 100 mASL).

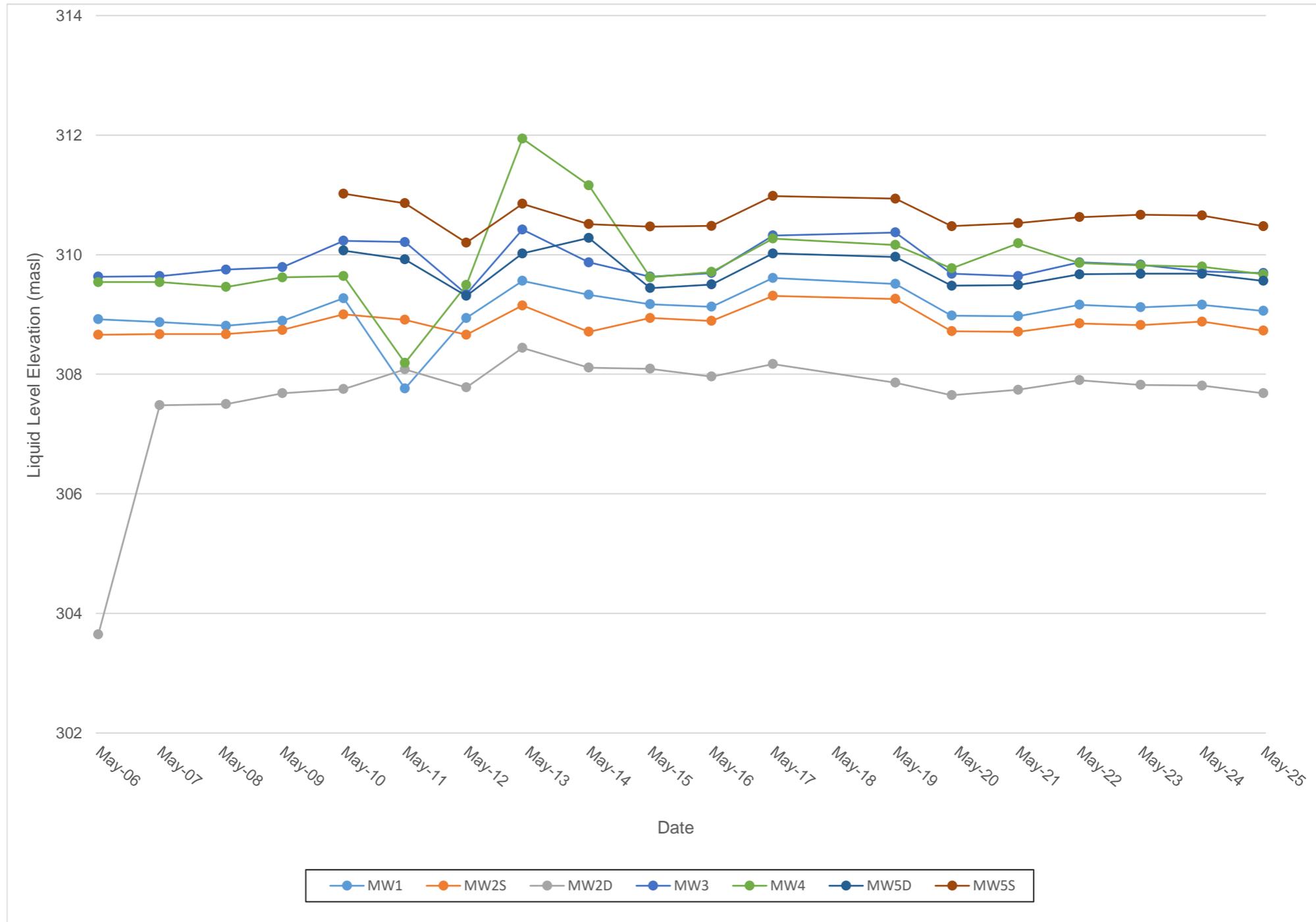
5. mBTOP denotes metres below top of pipe.

6. mASL denotes metres above sea level.

7. Blank denotes data not available.

**Figure C-1**  
**Groundwater Elevation Hydrograph**

**HYDROGRAPH**  
**GROUNDWATER ELEVATIONS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**



**APPENDIX D**  
**Groundwater Quality Results**

**Table D-1**  
**Leachate Analytical Results – General Parameters**

**TABLE D-1  
LEACHATE ANALYTICAL RESULTS - GENERAL PARAMETERS  
Hibbert Landfill  
County Road 24, Municipality of West Perth**

Parameter	Unit	ODWS	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1									
			May-06	May-07	Jun-08	May-09	May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24	May-25	
Field Electrical Conductivity	µS/cm	NV	592	760	762	679	787	1510	1120	1780	3780	1282	1470	970			1031	1048	1032	956	1013	1070	994
Total Hardness (as CaCO3)	mg/L	80-100 (OG)	301	396	419	360	449	523	391	561	523	439	376	354			375	389	369	382	374	445	388
pH		6.5-8.5 (OG)	7.92	7.78	8.17	8.06	7.93	7.89	8.01	7.85	7.9	7.74	7.86	7.83			7.52	7.44	7.78	7.62	7.63	7.71	7.47
Total Dissolved Solids	mg/L	500 (AO)	358	424	466	398	488	904	640	860	851	678	724	651			567	625	619	559	553	605	574
Alkalinity, Bicarbonate (as CaCO3)	mg/L	NV	321	392	366	355	448	421	362	384	1210	481	456	494			493	834	541	595	666	667	6610
Alkalinity, Carbonate (as CaCO3)	mg/L	NV	<10	<5	<5	<5	<5	<5	<5	<5	<10	<10	<10	<10			<10	<10	<2.0	<1.0	<1.0	<1.0	<25.0
Alkalinity, Total (as CaCO3)	mg/L	30-500 (OG)	321	392	366	355	448	421	352	384	1220	481	456	494			493	834	541	595	666	667	6610
Ammonia, Total (as N)	mg/L	NV	0.73	0.51	0.83	0.11	0.30	1.06	0.44	0.39	0.95	0.85	0.87	0.90			0.684	1.09	0.98	0.939	0.573	0.349	1.66
Bromide	mg/L	NV	<0.05	<0.05	0.090	<0.05	<0.05	<0.05	<0.05	<0.05	0.240	0.160	<0.50	<0.50			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.50
Chloride	mg/L	250 (AO)	5	13	26	14	17	321	156	354	234	134	141	108			48	76.7	57.8	41.3	33.0	10.9	43.9
Fluoride	mg/L	1.5 (MAC)	0.180	0.180	0.3	0.100	0.210	<0.05	<0.05	<0.5	0.130	0.179	0.130	0.120			0.152	0.224	0.219	0.216	0.191	0.078	0.332
(Nitrate + Nitrite) as N	mg/L	10.0 (MAC)	<0.1	0.1	<0.05	0.070	<0.05	<0.05	<0.05	<0.07	<0.2	<0.03	<0.11	<0.11			0.071	<0.022	<0.022	<0.0224	0.026	<0.024	<0.112
Nitrate as N	mg/L	10.0 (MAC)	<0.05	0.070	<0.05	0.070	<0.05	<0.05	<0.05	<0.5	<0.10	<0.020	<0.10	<0.10			0.060	<0.020	<0.020	<0.020	0.026	<0.020	<0.100
Nitrite as N	mg/L	1.0 (MAC)	<0.05	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.10	<0.010	<0.050	<0.050			0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050
Orthophosphate as P	mg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.0030	<0.0030	<0.0030	<0.0030			<0.0030	<0.0030	<0.0030	<0.0030	<0.0010	<0.0010	<0.0010
Sulphate	mg/L	500 (AO)	11.1	4.9	8.1	2.6	9.5	9.9	2.1	6.5	2.5	2.0	1.5	3.6			6.72	0.86	1.37	2.05	3.26	1.74	<1.50
Dissolved Organic Carbon (DOC)	mg/L	5.0 (AO)	3.3	3.2	5.8	3.6	4.1	6.5	5.0	7.0	6.0	4.9	7.3	4.2			3.89	4.66	4.86	3.88	3.41	4.39	3.61
Aluminum	mg/L	0.1 (OG)	<0.004	0.007	<0.004	<0.004	0.008	<0.004	0.004	0.005	<0.010	<0.010	<0.0050	<0.0050			<0.0050	<0.0050	<0.0050	0.001	0.0017	<0.0010	0.0118
Arsenic	mg/L	0.01 (IMAC)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.0010	<0.0010	<0.00033	0.00039			0.00025	0.00034	0.00032	0.00038	0.00021	0.00043	0.00041
Barium	mg/L	1.0 (MAC)	0.17	0.257	0.367	0.242	0.295	0.357	0.4	0.551	0.458	0.383	0.326	0.315			0.315	0.361	0.383	0.336	0.326	0.357	0.423
Boron	mg/L	5.0 (MAC)	0.124	0.139	0.142	0.072	0.132	0.096	0.116	0.13	0.136	0.149	0.152	0.177			0.13	0.165	0.169	0.152	0.137	0.140	0.167
Cadmium	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.00090	<0.00090	<0.00010	<0.00010			<0.00010	<0.00010	<0.00010	<0.000050	0.00	0.000091	<0.000050
Calcium	mg/L	NV	96	123	134	119	163	174	119	179	162	133	113	105			115	114	112	113	114	138	114
Chromium	mg/L	0.05 (MAC)	<0.003	<0.003	<0.003	<0.003	<0.003	0.005	0.006	<0.003	0.00312	<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050	<0.00050	0.00	<0.00050	<0.00050
Chromium	mg/L	0.05 (MAC)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.0010	<0.0010	0.00032	<0.00020			<0.00020	0.00034	<0.00020	<0.00020	0.00114	<0.00020	<0.00020
Copper	mg/L	1.0 (AO)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.0010	<0.0010	0.00032	<0.00020			<0.00020	0.00034	<0.00020	<0.00020	0.00114	<0.00020	<0.00020
Iron	mg/L	0.3 (AO)	6.28	5.84	8.87	4.18	8.09	12.6	15.4	18.4	14.6	<0.050	<0.010	<0.010			0.075	<0.010	<0.010	<0.010	0.012	<0.010	5.08
Lead	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.00050	<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050	<0.00050	0.00	<0.00050	0.00059
Magnesium	mg/L	NV	14.8	21.5	20.4	15.2	10.27	21.6	22.8	27.8	28.4	23.1	22.1			21.3	25.2	21.6	24.3	21.8	24.5	25.2	
Manganese	mg/L	0.05 (AO)	0.145	0.195	0.185	0.219	0.217	1.29	0.72	0.972	0.403	0.242	0.177	0.123			0.109	0.113	0.102	0.104	0.17	0.100	0.122
Potassium	mg/L	NV	3.32	2.34	4.03	2.75	24.9	5.9	6.42	8.39	7.8	7.7	7.45	7.63			6.98	7.65	7.50	7.74	6.34	6.78	7.37
Selenium	mg/L	0.05 (MAC)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.00040	<0.00040	0.000137	0.000325			0.000221	0.000153	0.000132	0.000172	0.000174	<0.000500	0.00092
Silicon	mg/L	NV	3.96	4.33	5.79	3.77	5.38	5.15	5.93	5.48	7.6	6	5.89	5.22			6.19	6.25	6.33	6.53	6.11	7.29	7.21
Sodium	mg/L	200 (AO)	4.2	8.21	9.99	6.76	4.33	143	46.7	118	141	106	144	113			75.2	107	84	71.5	70.5	48.3	74.3
Zinc	mg/L	5.0 (AO)	0.03900	0.08700	0.16000	0.33200	0.41400	0.12300	0.30200	0.17600	0.01080	0.06600	0.03700	0.02680			0.0201	0.0168	0.0295	0.0184	0.1250	0.0979	0.0396

Notes: 1. ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, Conservation and Parks, as updated 2018.  
2. OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.  
3. < denotes analyte concentration is below the reportable detection limit (RDL) or the method reporting limit (MRL).  
4. Bold and Shaded denotes exceedances of the ODWS.  
5. Blank denotes data not available.  
6. Unless otherwise stated, units are reported in mg/L.  
7. NV denotes No Value

**TABLE D-1  
LEACHATE ANALYTICAL RESULTS - GENERAL PARAMETERS  
Hibbert Landfill  
County Road 24, Municipality of West Perth**

Parameter	Unit	ODWS	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4							
			May-06	May-07	Jun-08	May-09	May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24	May-25
Field Electrical Conductivity	µS/cm	NV	810	779	820	748	865	1490	2040	2360	1330	1551	1590	1270								
Total Hardness (as CaCO3)	mg/L	80-100 (OG)	367	375	425	385	435	582	543	492	946	345	291	324								
pH	pH	6.5-8.5 (OG)	7.88	7.81	8.23	8	8.04	7.99	7.93	8.05	6.99	7.85	8.02	7.69								
Total Dissolved Solids	mg/L	500 (AO)	442	414	476	438	536	896	1300	1210	1060	791	833	941								
Alkalinity, Bicarbonate (as CaCO3)	mg/L	NV	397	399	391	406	516	391	289	388	627	464	467	561								
Alkalinity, Carbonate (as CaCO3)	mg/L	NV	<10	<5	<5	<5	<5	<5	<5	<5	<10	<10	<10	<10								
Alkalinity, Total (as CaCO3)	mg/L	30-500 (OG)	397	399	435	406	516	391	289	388	628	464	467	561								
Ammonia, Total (as N)	mg/L	NV	1.15	0.99	1.82	0.10	0.04	0.50	0.59	0.43	0.19	0.86	0.71	0.80								
Bromide	mg/L	NV	<0.05	<0.05	0.080	<0.05	<0.05	<0.05	<0.05	<0.5	0.140	0.190	<0.50	<0.50								
Chloride	mg/L	250 (AO)	17	18	15	10	8	305	485	542	37	285	179	188								
Fluoride	mg/L	1.5 (MAC)	0.160	0.260	0.240	0.080	<0.05	<0.05	<0.05	<0.5	0.200	0.260	0.160	0.200								
(Nitrate + Nitrite) as N	mg/L	10.0 (MAC)	<0.1	0.120	0.320	<0.05	0.400	<0.05	<0.05	<0.07	<0.2	<0.03	<0.11	0.350								
Nitrate as N	mg/L	10.0 (MAC)	<0.05	0.070	0.320	<0.05	0.400	<0.05	<0.05	<0.5	<0.10	<0.020	<0.10	0.350								
Nitrite as N	mg/L	1.0 (MAC)	<0.05	0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.10	<0.010	<0.050	<0.050								
Orthophosphate as P	mg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	0.003	<0.0030	<0.0030	<0.0030								
Sulphate	mg/L	500 (AO)	42.1	13.0	26.5	7.7	21.1	6.8	2.8	18.5	334.0	2.6	9.6	15.2								
Dissolved Organic Carbon (DOC)	mg/L	5.0 (AO)	7.9	3.5	5.3	6.0	7.7	7.0	3.9	6.9	6.2	4.7	6.4	4.8								
Aluminum	mg/L	0.1 (OG)	<0.004	0.139	0.012	0.008	0.004	<0.004	0.006	0.008	<0.010	<0.010	<0.0050	<0.0050								
Arsenic	mg/L	0.01 (IMAC)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.005	<0.003	0.0048	<0.0010	0.00065	0.00049								
Barium	mg/L	1.0 (MAC)	0.126	0.252	0.186	0.11	0.191	0.307	0.421	0.4	0.0619	0.263	0.209	0.221								
Boron	mg/L	5.0 (MAC)	0.428	0.387	0.451	0.249	0.407	0.314	0.28	0.238	0.136	0.216	0.179	0.266								
Cadmium	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.00090	<0.00090	<0.00010	<0.00010								
Calcium	mg/L	NV	91.6	89.9	106	109	148	153	136	122	230	87	74.9	80.1								
Chromium	mg/L	0.05 (MAC)	<0.003	<0.003	<0.003	<0.003	<0.003	0.006	0.014	<0.003	0.00272	<0.00050	<0.00050	<0.00050								
Copper	mg/L	1.0 (AO)	0.01	<0.003	0.006	0.005	<0.003	<0.003	<0.003	<0.003	<0.0010	<0.0010	0.00025	0.00044								
Iron	mg/L	0.30 (AO)	0.601	2.96	1.6	1.76	0.271	5.57	4.71	1.69	3.52	<0.050	<0.010	<0.010								
Lead	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050								
Magnesium	mg/L	NV	33.5	36.5	38.9	27.5	15.8	48.6	49.4	45.4	90.1	30.9	25.2	30								
Manganese	mg/L	0.05 (AO)	0.377	0.309	0.2	0.458	0.287	0.462	0.636	0.265	0.61	0.198	0.21	0.196								
Potassium	mg/L	NV	19.7	17.6	17.5	11	43.2	17.7	17.8	16.7	2.4	14.2	11.1	12.2								
Selenium	mg/L	0.05 (MAC)	<0.004	<0.004	<0.004	<0.004	0.012	<0.004	<0.004	<0.004	0.0006	0.0009	0.000311	0.000281								
Silicon	mg/L	NV	4.67	3.81	5.08	3	4.05	3.89	4.63	3.23	12.7	3.4	3.78	4.05								
Sodium	mg/L	200 (AO)	13.2	16.3	15.7	12.1	15.8	91.3	148	251	90.2	230	205	230								
Zinc	mg/L	5.0 (AO)	0.008	0.012	0.046	0.014	0.025	<0.004	0.006	0.011	<0.0030	<0.0030	<0.0010	0.0011								

No sample collected.

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2. OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.  
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4. Bold and Shaded denotes exceedances of the ODWS.  
5. Blank denotes data not available.  
6. Unless otherwise stated, units are reported in mg/L.  
7. NV denotes No Value

**Table D-2**  
**Leachate Analytical Results – Volatile Organic Compounds**

**TABLE D-2  
LEACHATE ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS  
Hibbert Landfill  
County Road 24, Municipality of West Perth**

Parameter	Unit	ODWS	MW1																	
			May-06	Jun-08	May-09	May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24
Acetone	µg/L	NV	<0.5	<0.5	<1	<1	<1	<1	<1	<1	26	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzene	µg/L	1 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoforn	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Tetrachloride	µg/L	2 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	µg/L	80 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	µg/L	NV	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylene Dibromide	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	µg/L	200 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	µg/L	5 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	µg/L	NV													<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	µg/L	5 (IMAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethene	µg/L	14 (MAC)	<0.2	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-dichloroethylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	µg/L	50 (MAC)	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,3-Dichloropropene	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	µg/L	2.4 (AO)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Hexane	µg/L	NV				<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Hexanone	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Ethyl Ketone	µg/L	NV	<0.9	<0.9	<1	<1	<1	<1	<1	<1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Isobutyl Ketone	µg/L	NV	<0.3	<0.3	<1	<1	<1	<1	<1	<1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl tert-butyl ether	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2,2-Tetrachloroethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene	µg/L	10 (MAC)	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	µg/L	24 (AO)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	5.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<10	<10	<10	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	µg/L	5 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	µg/L	NV	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	µg/L	1 (MAC)	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
o-Xylene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
m & p-Xylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Xylenes(Total)	µg/L	90 (AO)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes: 1. ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, Conservation and Parks, as updated 2018.  
2. OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.  
3. < denotes analyte concentration is below the reportable detection limit (RDL) or the method reporting limit (MRL).  
4. Bold denotes parameter detected above laboratory detection limit.  
5. Shaded denotes exceedances of the ODWS.  
6. Blank denotes data not available.  
7. Unless otherwise stated, units are reported in µg/L.  
8. NV denotes No Value

TABLE D-2  
LEACHATE ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS  
Hibbert Landfill  
County Road 24, Municipality of West Perth

Parameter	Unit	ODWS	MW4																			
			May-06	May-07	Jun-08	May-09	May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24	May-25
Acetone		NV	41	<0.5	<0.5	<1	<2	<1	<1	<1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzene	µg/L	1 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Tetrachloride	µg/L	2 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	µg/L	80 (MAC)	0.72	1.3	<0.1	<0.1	<0.2	1.2	<0.1	1.5	<0.50	1.2	0.79	1.1	1.13	0.95	1.16	0.95	0.59	<0.50	<0.50	1.04
Dibromochloromethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50
Chloroethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50
Chloroform	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50
Chloromethane	µg/L	NV	<0.4	<0.4	<0.4	<0.4	<0.8	<0.4	<0.4	<0.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0
Ethylene Dibromide	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.1	<0.1	<0.50	<0.50	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	µg/L	200 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	µg/L	5 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	µg/L	NV															<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.6	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	µg/L	5 (IMAC)	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethene	µg/L	14 (MAC)	<0.3	<0.3	<0.3	<0.3	<0.6	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-dichloroethylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	µg/L	50 (MAC)	<0.3	<0.3	<0.3	<0.3	<0.6	<0.3	<0.3	<0.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,3-Dichloropropene	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.6	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	µg/L	2.4 (AO)	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Hexane	µg/L	NV					<0.4	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.52
2-Hexanone	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.6	<0.3	<0.3	<0.3	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Ethyl Ketone	µg/L	NV	<0.9	<0.9	<0.9	<1	<2	<1	<1	<1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Isobutyl Ketone	µg/L	NV	<0.3	<0.3	<0.3	<1	<2	<1	<1	<1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl tert-butyl ether	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene	µg/L	10 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	µg/L	24 (AO)	0.4	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	<0.40	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.6	<0.3	<0.3	<0.3	<10	<10	<10	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.6	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	µg/L	5 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	µg/L	NV	<0.4	<0.4	<0.4	<0.4	<0.8	<0.4	<0.4	<0.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50
Vinyl Chloride	µg/L	1 (MAC)	<0.17	<0.17	<0.17	<0.17	<0.34	<0.17	<0.17	<0.17	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20
o-Xylene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
m & p-Xylene	µg/L	NV	0.22	0.25	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.40	<0.40	<0.40	<0.40	<0.40	0.51
Xylenes(Total)	µg/L	90 (AO)	0.22	0.25	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.40	<0.40	<0.40	<0.40	<0.40	0.51

Notes: 1. ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, Conservation and Parks, as updated 2018.  
2. OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.  
3. < denotes analyte concentration is below the reportable detection limit (RD/L) or the method reporting limit (MRL).  
4. Bold denotes parameter detected above laboratory

**Table D-3**  
**Groundwater Analytical Results – General Parameters**

**TABLE D-3  
GROUNDWATER ANALYTICAL RESULTS - GENERAL PARAMETERS  
Hibbert Landfill  
County Road 24, Municipality of West Perth**

Parameter	Unit	ODWS	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	
			May-06	May-07	Jun-08	May-09	May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24	May-25	
Field Electrical Conductivity	uS/cm	NV	995	800	863	779	673	641	864	634	463	862	970	524	688	688	645	863	813	814	962	942	
Total Hardness (as CaCO3)	mg/L	80-100 (OG)	465	406	447	395	401	251	387	275	404	464	395	318	344	438	471	439	388	483	444		
pH	N/A	6.5-8.5 (OG)	7.76	7.69	8.11	8.08	7.88	8.06	8.1	7.94	7.57	7.54	7.71	7.49	7.17	7.25	7.17	7.65	7.54	7.42	7.49		
Total Dissolved Solids	mg/L	500 (AO)	608	490	508	450	438	372	480	328	405	479	553	439	613	426	480	614	473	430	554	556	
Alkalinity, Bicarbonate (as CaCO3)	mg/L	NV	437	374	422	383	376	267	449	325	495	494	431	351	394	561	784	465	549	566	761		
Alkalinity, Carbonate (as CaCO3)	mg/L	NV	<10	<5	<5	<5	<5	<5	<5	<5	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<1.0	<1.0		
Alkalinity, Total (as CaCO3)	mg/L	30-500 (OG)	437	374	422	383	376	267	449	325	497	494	431	351	411	394	561	784	465	549	566	761	
Ammonia, Total (as N)	mg/L	NV	1.05	0.20	0.64	<0.02	0.03	0.26	0.47	0.05	0.74	0.12	0.06	0.308		0.016	0.011	0.025	0.010	0.022	<0.0050	0.015	
Bromide	mg/L	NV	0.240	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.10	<0.10	<0.10	<0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Chloride	mg/L	250 (AO)	37.8	24.1	31.7	20.8	11.2	55.6	16.6	6.8	12.7	23.2	25.1	9.89	10.2	6.65	5.14	4.48	2.00	2.91	2.55		
Fluoride	mg/L	1.5 (MAC)	0.340	0.330	0.260	0.210	0.150	<0.05	<0.05	<0.1	0.120	0.163	0.137	0.135	0.153	0.121	0.287	0.144	0.216	0.146	0.120	0.324	
(Nitrate + Nitrite) as N	mg/L	10.0 (MAC)	<0.1	0.160	0.050	0.060	<0.05	0.500	0.090	0.450	0.320	0.432	0.033	1.530	1.764	3.28	1.75	3.05	1.41	1.41	<0.0224	1.03	
Nitrate as N	mg/L	10.0 (MAC)	<0.05	0.160	0.050	0.060	<0.05	0.500	0.090	0.450	0.320	0.432	0.033	1.530	1.750	3.28	1.75	3.05	1.41	1.41	<0.020	1.03	
Nitrite as N	mg/L	1.0 (MAC)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Orthophosphate as P	mg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	0.0034	0.0082	0.0103	<0.0030	0.0077	<0.0030	0.0064	0.0048	0.0033	0.0031	0.0017		
Sulphate	mg/L	500 (AO)	71.5	46.2	27.2	23.8	17.3	10.1	19.4	6.1	5.4	10.6	11.3	5.91	8.97	8.04	12.30	11.20	8.74	5.33	4.50	7.15	
Dissolved Organic Carbon (DOC)	mg/L	5.0 (AO)	5.4	3.4	5.8	2.3	4.7	6.6	6.4	4.2	4.2	2.5	6.4	4.9	3.0	3.29	3.17	3.18	2.49	2.58	2.70	2.48	
Aluminum	mg/L	0.1 (OG)	<0.004	<0.004	<0.004	<0.004	0.008	0.011	0.007	0.006	<0.010	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0011	0.0015	0.0012	0.0012	
Arsenic	mg/L	0.01 (IMAC)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0048	<0.0010	0.00031	0.00034	0.00055	0.00018	0.00018	0.00018	0.00018	0.00016	0.00014	0.00018	0.00016
Barium	mg/L	1.0 (MAC)	0.144	0.13	0.089	0.078	0.061	0.041	0.079	0.046	0.0574	0.0928	0.0738	0.0547	0.0725	0.0595	0.079	0.109	0.0803	0.0785	0.102	0.0968	
Boron	mg/L	5.0 (MAC)	0.296	0.057	0.068	0.027	0.04	0.026	0.037	0.018	0.044	0.029	0.028	0.030	0.027	0.023	0.031	0.039	0.031	0.029	0.036	0.036	
Cadmium	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.000090	<0.000090	0.000079	0.000044	0.000078	0.000055	0.000061	0.000076	0.0000533	0.0000222	0.0000617	0.0000226	
Calcium	mg/L	NV	137	125	152	131	129	88.7	125	95.6	130	154	132	111	117	143	153	143	126	158	142		
Chromium	mg/L	0.05 (MAC)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.00135	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Copper	mg/L	1.0 (AO)	0.057	<0.003	0.008	0.005	0.004	0.004	<0.003	0.003	<0.0010	0.0013	0.00187	0.00302	0.00111	0.00203	0.00124	0.0009	0.00134	0.00155	0.00126	0.00156	
Iron	mg/L	0.3 (AO)	1.55	0.618	0.411	<0.01	<0.01	<0.01	<0.01	7.44	<0.050	<0.050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	
Lead	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Magnesium	mg/L	NV	29.9	22.8	16.4	16.4	19.1	7.27	18.3	8.84	19.2	19.5	16.0	9.7	12.7	19.4	21.6	19.9	17.7	21.5	21.6		
Manganese	mg/L	0.05 (AO)	0.185	0.063	0.045	0.035	0.003	<0.002	0.084	0.004	0.238	0.0408	0.0718	0.0206	0.0776	0.00164	0.0051	0.00123	0.00348	0.00089	0.00525	0.00202	
Potassium	mg/L	NV	10.7	4.43	1.60	1.72	13.1	1.48	1.36	1.03	2.20	1.00	1.15	1.00	0.599	0.806	0.518	0.503	0.599	0.475	0.536		
Selenium	mg/L	0.05 (MAC)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.00056	0.00227	0.000398	0.00463	0.00471	0.00495	0.00375	0.00436	0.00371	0.00363	0.000553	0.00478	
Silicon	mg/L	NV	6.74	3.23	3.61	2.49	2.42	2.13	2.61	1.85	6.1	2.8	2.4	1.92	1.96	2.39	2.94	2.58	2.45	3.06	3.02		
Sodium	mg/L	200 (AO)	23	14.9	23.6	17.1	49.3	33.1	23.1	24.9	24.8	22.1	13.7	18.5	12.1	18.7	17.3	13.2	11.2	13.4	12.9		
Zinc	mg/L	5.0 (AO)	0.00400	<0.004	0.04400	0.02200	0.02000	0.01500	<0.004	<0.005	0.00450	<0.0030	0.00110	<0.0010	<0.0010	0.00120	0.00100	0.00130	<0.0010	0.00190	0.0011	0.0018	

Notes: 1. ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, Conservation and Parks, as updated 2018.  
2. OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.  
3. < denotes analyte concentration is below the reportable detection limit (RDL) or the method reporting limit (MRL).  
4. Bold and Shaded denotes exceedances of the ODWS.  
5. Blank denotes data not available.  
6. Unless otherwise stated, units are reported in mg/L.  
7. NV denotes No Value

**TABLE D-3  
GROUNDWATER ANALYTICAL RESULTS - GENERAL PARAMETERS  
Hibbert Landfill  
County Road 24, Municipality of West Perth**

Parameter	Unit	ODWS	MW2D	MW2D	MW2D	MW2D	MW2D	MW2D	MW2D	MW2D	MW2D	MW2D	MW2D	MW2D	MW2D								
			May-06	May-07	Jun-08	May-09	May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24	May-25	
Field Electrical Conductivity	uS/cm	NV	1080	915	971	907	775	767	774	800	583	712	900	650		763	686	690	721	806	773	829	
Total Hardness (as CaCO3)	mg/L	80-100 (OG)	406	349	369	330	290	299	278	278	308	286	284	274	285	283	288	284	286	280	283	279	
pH	N/A	6.5-8.5 (OG)	8.01	7.9	8.54	8.27	8.26	8.16	8.25	8.22	7.98	8.01	8.14	7.84	7.78	7.76	8.08	8.00	8.11	8.24	8.01		
Total Dissolved Solids	mg/L	500 (AO)	868	578	638	592	554	474	430	426	455	426	548	546	520	442	440	445	433	422	442	521	
Alkalinity, Bicarbonate (as CaCO3)	mg/L	NV	249	293	292	320	332	325	331	332	351	340	335	349		339	414	395	353	364	405	765	
Alkalinity, Carbonate (as CaCO3)	mg/L	NV	<10	<5	22	<5	<5	<5	<5	<5	<10	<10	<10	<10		<10	<2.0	<2.0	<1.0	<1.0	<1.0	<5.0	
Alkalinity, Total (as CaCO3)	mg/L	30-500 (OG)	249	293	314	320	332	325	331	332	354	340	335	349	336	339	414	395	353	364	405	765	
Ammonia, Total (as N)	mg/L	NV	0.960	0.190	0.810	0.020	0.100	0.020	0.230	0.070	0.069	0.061	0.031	0.037		0.043	0.013	0.012	0.006	<0.0050	<0.0050	0.0157	
Bromide	mg/L	NV	1.000	<0.05	0.050	<0.05	<0.05	<0.05	<0.05	<0.25	<0.10	<0.10	<0.10	<0.10		<0.10	<0.10	0.100	0.120	<0.10	<0.10	0.18	
Chloride	mg/L	250 (AO)	117.0	14.8	10.2	8.80	9.01	12.3	11.2	13.5	15.2	17.0	19.6	22.6	25.6	27.9	29.9	31.7	34.3	33.7	35.2	37.8	
Fluoride	mg/L	1.5 (MAC)	0.440	0.850	0.790	0.710	0.660	<0.05	<0.05	0.560	0.880	0.931	0.911	0.931	0.872	0.960	0.948	0.969	0.941	0.941	0.844	0.985	
(Nitrate + Nitrite) as N	mg/L	10.0 (MAC)	<0.1	<0.05	0.18	0.05	<0.05	<0.05	<0.05	<0.07	<0.2	<0.03	<0.022	0.03	<0.022	<0.022	<0.022	<0.022	<0.0224	<0.0224	<0.0224	0.0270	
Nitrate as N	mg/L	10.0 (MAC)	<0.05	<0.05	0.13	0.05	<0.05	<0.05	<0.05	<0.25	<0.10	0.03	0.02	0.03	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.027	
Nitrite as N	mg/L	1.0 (MAC)	<0.05	<0.05	0.050	<0.05	<0.05	<0.05	<0.05	<0.25	<0.10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Orthophosphate as P	mg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	0.0046	0.0032	0.0042	<0.0030	0.0047	<0.0030	0.0047	0.0053	0.0045	0.0057	0.0040		
Sulphate	mg/L	500 (AO)	169.0	212.0	199.0	164.0	142.0	115.0	89.2	77.0	71.4	65.5	63.5	60.9	54.3	46.7	43.8	42.5	37.8	33.1	34.6		
Dissolved Organic Carbon (DOC)	mg/L	5.0 (AO)	15.4	4.10	6.00	4.30	9.80	4.00	3.00	2.30	<1.0	1.90	3.40	1.70	3.00	1.78	2.12	2.42	1.39	1.75	1.72	1.70	
Aluminum	mg/L	0.1 (OG)	0.2320	0.0050	0.0120	<0.004	0.0050	0.0060	0.0060	0.0060	0.0120	<0.010	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0022	0.1160	0.0021	0.0041	
Arsenic	mg/L	0.01 (IMAC)	<0.003	0.005	0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.0010	<0.0010	0.00083	0.00046	0.00161	0.00056	0.00065	0.00069	0.00063	0.00066	0.00062	
Barium	mg/L	1.0 (MAC)	0.084	0.06	0.047	0.038	0.04	0.04	0.043	0.041	0.0419	0.0466	0.0456	0.0382	0.0433	0.0445	0.0465	0.0502	0.0447	0.0528	0.0511	0.0455	
Boron	mg/L	5.0 (MAC)	0.268	0.127	0.116	0.077	0.101	0.083	0.073	0.078	0.072	0.074	0.065	0.068	0.073	0.065	0.060	0.065	0.058	0.055	0.058	0.061	
Cadmium	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.00090	<0.00090	0.00011	<0.00010	<0.00010	0.00001	<0.00010	<0.00010	0.000052	0.000082	0.000070	0.000073	
Calcium	mg/L	NV	105	78	85.4	78.1	65.8	72.6	66.9	67.7	75.3	67.8	65.3	69.1	69.2	69.2	65.6	62.6	66.6	67.0	66.1		
Chromium	mg/L	0.05 (MAC)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0011	<0.00050	0.0023	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Copper	mg/L	1.0 (AO)	0.023	<0.003	0.005	<0.003	<0.003	<0.003	<0.003	<0.003	0.0011	<0.0010	0.00091	0.0007	0.0007	0.00047	0.00055	0.00045	0.00054	0.00158	0.00057	0.00059	
Iron	mg/L	0.3 (AO)	0.681	1.13	0.802	0.028	<0.01	<0.01	<0.01	0.016	<0.050	<0.050	0.069	<0.010	<0.010	<0.010	<0.010	<0.010	0.088	<0.010	<0.010	<0.010	
Lead	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.000173	<0.00050	<0.00050	
Magnesium	mg/L	NV	34.9	37.5	37.9	32.7	30.6	28.6	27.0	26.5	29.1	28.5	27.4	26.9	26.7	27.9	24.4	26.7	27.5	28.0	27.6		
Manganese	mg/L	0.05 (AO)	0.083	0.02	0.026	0.016	0.014	0.025	0.004	0.007	<0.0010	<0.0010	0.00146	0.00695	<0.00050	0.00146	<0.00050	<0.00050	0.00037	0.00443	0.00047	0.00028	
Potassium	mg/L	NV	20.800	8.370	5.450	3.900	3.980	3.320	3.110	2.770	2.700	2.800	2.700	2.600	2.560	2.460	2.210	2.100	2.110	2.070	2.08	1.99	
Selenium	mg/L	0.05 (MAC)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.00040	<0.00040	0.000246	0.000212	0.000094	0.000106	0.000106	0.000091	0.000118	0.000092	<0.000500	0.000087	
Silicon	mg/L	NV	5.19	5.52	6.26	4.22	5.51	5.41	5.08	5.43	6.8	5.6	5.6	5.43	5.10	5.54	5.60	5.34	5.54	6.21	5.93	5.85	
Sodium	mg/L	200 (AO)	38.9	68.4	85.9	77.3	73.7	68.9	60.3	57.7	58.3	62.7	61.2	62.8	65.1	59.3	65.1	54.6	62.3	61.2	66.6	69.1	
Zinc	mg/L	5.0 (AO)	<0.004	0.0110	0.0690	<0.004	0.0100	<0.004	<0.004	<0.004	<0.005	<0.0030	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0069	<0.0010	<0.0010	

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**TABLE D-3  
GROUNDWATER ANALYTICAL RESULTS - GENERAL PARAMETERS  
Hibbert Landfill  
County Road 24, Municipality of West Perth**

Parameter	Unit	ODWS	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3								
			May-06	May-07	Jun-08	May-09	May-10	May-11	May-12	Apr-13	May-14	May-15	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24	May-25
Field Electrical Conductivity	uS/cm	NV	830	797	792	985	799	722	1180	826	506	930	654	777	735	810	806	681	943	783	
Total Hardness (as CaCO3)	mg/L	80-100 (OG)	420	421	447	507	463	345	543	363	563	514	392	411	388	411	488	441	384	461	398
pH	N/A	6.5-8.5 (OG)	7.87	7.84	8.19	7.93	8	7.95	7.99	7.92	7.59	7.49	7.43	7.23	7.32	7.64	7.69	7.64	7.66	7.58	
Total Dissolved Solids	mg/L	500 (AO)	474	484	498	652	516	456	638	426	495	534	527	633	464	484	599	495	425	537	676
Alkalinity, Bicarbonate (as CaCO3)	mg/L	NV	376	372	392	436	416	342	555	402	458	503	453	416	2050	552	566	2560	617	8790	
Alkalinity, Carbonate (as CaCO3)	mg/L	NV	<10	<5	<5	<5	<5	<5	<5	<5	<10	<10	<10	<10	<10	<2.0	<1.0	<1.0	<1.0	<1.0	
Alkalinity, Total (as CaCO3)	mg/L	30-500 (OG)	376	372	392	436	416	342	555	402	459	503	453	458	416	2050	552	566	2560	617	8790
Ammonia, Total (as N)	mg/L	NV	0.490	<0.02	0.500	<0.02	<0.02	<0.02	0.050	0.060	0.170	0.073	0.027		<0.010	0.015	0.017	0.023	<0.0050	<0.0050	0.0353
Bromide	mg/L	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoride	mg/L	250 (AO)	9.9	15.2	13.0	52.6	33.0	68.9	64.5	22.6	18.5	20.6	19.4	16.6	13.9	11.0	7.57	6.52	3.99	3.01	4.78
Nitrate + Nitrite as N	mg/L	1.5 (MAC)	0.250	0.470	0.310	<0.05	<0.05	<0.05	<0.05	<0.05	0.110	0.106	0.104	0.080	0.094	0.115	0.076	0.077	0.177	0.060	0.181
Nitrate as N	mg/L	10.0 (MAC)	<0.1	0.28	0.26	<0.05	0.32	<0.05	<0.05	<0.07	<0.2	<0.03	0.02	0.09	0.26	0.032	0.027	0.047	0.040	<0.0224	0.095
Nitrite as N	mg/L	1.0 (MAC)	<0.05	0.28	0.26	<0.05	0.32	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	0.09	0.26	0.032	0.027	0.047	0.040	0.0950
Nitrite as N	mg/L	1.0 (MAC)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate as P	mg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0081	<0.0030	<0.0010	0.0018	<0.0010	
Sulphate	mg/L	500 (AO)	69.4	66.4	47.2	34.1	33.9	8.7	31.2	13.1	9.5	14.4	9.6	11.2	10.8	9.2	7.4	7.2	5.2	2.87	5.59
Dissolved Organic Carbon (DOC)	mg/L	5.0 (AO)	4.30	4.40	4.60	10.4	20.1	4.40	3.90	5.20	3.30	3.70	4.70	4.30	4.34	5.52	4.69	3.82	3.69	3.74	3.61
Aluminum	mg/L	0.1 (OG)	0.0210	0.0210	0.0340	<0.004	0.0060	<0.004	0.0060	0.0060	1.73	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0016	0.0018	0.0012	0.0017
Arsenic	mg/L	0.01 (IMAC)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0019	<0.010	0.00029	0.00022	0.00017	0.0002	0.00035	0.00024	0.00021	0.00026	0.0002
Barium	mg/L	1.0 (MAC)	0.085	0.109	0.069	0.065	0.056	0.06	0.102	0.048	0.0903	0.101	0.0667	0.0702	0.0607	0.0635	0.0757	0.0686	0.0735	0.0775	0.069
Boron	mg/L	5.0 (MAC)	0.060	0.052	0.048	0.031	0.041	0.030	0.034	0.027	0.036	0.035	0.032	0.025	0.024	0.026	0.032	0.031	0.026	0.035	0.025
Cadmium	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.00090	<0.00090	0.000026	0.000024	0.000036	0.000028	0.000084	0.0000394	0.0000216	0.0000471	0.0000255
Calcium	mg/L	NV	128	126	137	156	153	107	163	113	177	157	124	123	129	153	138	121	145	124	
Chromium	mg/L	0.05 (MAC)	<0.003	0.003	<0.003	0.003	<0.003	<0.003	0.004	<0.003	0.00414	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper	mg/L	1.0 (AO)	0.003	<0.003	0.012	0.003	<0.003	<0.003	<0.003	<0.003	0.0032	0.0018	0.0015	0.00195	0.00198	0.00219	0.00219	0.00214	0.00179	0.00183	0.00165
Iron	mg/L	0.3 (AO)	0.389	0.458	0.323	0.456	<0.01	<0.01	0.035	0.016	4.34	<0.050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.021	<0.010	0.014
Lead	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.00157	<0.00050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Magnesium	mg/L	NV	24.3	25.8	25.4	28.6	19.6	19.0	33.1	19.6	29.6	29.4	20.2	19.2	21.5	25.5	23.5	19.8	24.0	21.4	
Manganese	mg/L	0.05 (AO)	0.639	0.181	0.046	0.631	0.006	0.082	0.186	0.015	0.331	0.0896	0.0425	0.00646	0.00242	0.00164	0.0007	0.00305	0.0362	0.0113	0.0169
Potassium	mg/L	NV	2.000	2.030	1.060	0.510	27.500	0.480	0.800	0.400	1.200	<1.0	0.311		0.215	0.259	0.238	0.218	0.311	0.189	0.178
Selenium	mg/L	0.05 (MAC)	<0.004	<0.004	0.005	<0.004	<0.004	<0.004	<0.004	<0.004	0.00051	0.00042	0.00043	0.000377	0.000446	0.000603	0.000647	0.000373	0.000460	<0.000500	0.000411
Silicon	mg/L	NV	4.51	3.32	3.63	2.60	2.54	2.41	3.95	2.29	10.50	3.00	2.08	1.87	2.14	2.66	2.16	2.32	2.69	2.33	
Sodium	mg/L	200 (AO)	8.85	14.2	14.3	19.9	0.56	32.2	35.7	27	24.2	21.7	27.8	27.9	23	28.3	28.9	22	15.4	18.4	12.9
Zinc	mg/L	5.0 (AO)	<0.004	<0.004	0.1010	0.0120	0.0090	0.0150	<0.004	<0.005	0.0083	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.0032	<0.0010	<0.0010	0.0012	<0.0010

Notes: 1. ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, Conservation and Parks, as updated 2018.  
2. OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.  
3. < denotes analyte concentration is below the reportable detection limit (RDL) or the method reporting limit (MRL).  
4. Bold and Shaded denotes exceedances of the ODWS.  
5. Blank denotes data not available.  
6. Unless otherwise stated, units are reported in mg/L.  
7. NV denotes No Value

**TABLE D-3  
GROUNDWATER ANALYTICAL RESULTS - GENERAL PARAMETERS  
Hibbert Landfill  
County Road 24, Municipality of West Perth**

TABLE D-3

Parameter	Unit	ODWS	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S
			May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	April-20	May-21	May-22	May-23	May-24	May-25
Field Electrical Conductivity	uS/cm	NV	819	907	924	1090	622	838	930	656	793	651	954	845	740	712	677	
Total Hardness (as CaCO3)	mg/L	80-100 (OG)	446	385	384	348	320	362	290	250	305	325	320	401	394	307	330	319
pH	N/A	6.5-8.5 (OG)	7.92	8.13	8.24	8.21	7.83	7.9	8.08	7.93	7.72	7.77	7.74	7.64	7.83	7.97	7.84	
Total Dissolved Solids	mg/L	500 (AO)	584	546	516	628	582	474	527	489	579	504	475	731	548	416	459	585
Alkalinity, Bicarbonate (as CaCO3)	mg/L	NV	347	376	387	343	449	436	365	303		319	302	220	314	538	386	872
Alkalinity, Carbonate (as CaCO3)	mg/L	NV	<5	<5	<5	<5	<10	<10	<10	<10		<10	<2.0	<2.0	<1.0	<1.0	<5.0	
Alkalinity, Total (as CaCO3)	mg/L	30-500 (OG)	347	376	387	343	452	436	365	303	337	319	302	220	314	538	386	872
Ammonia, Total (as N)	mg/L	NV	0.020	<0.02	0.040	0.040	<0.050	<0.050	<0.020	0.040		<0.010	0.041	0.012	<0.0050	<0.0050	<0.0050	<0.0050
Bromide	mg/L	NV	<0.05	<0.05	<0.05	<0.25	<0.10	<0.10	<0.10	<0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chloride	mg/L	250 (AO)	48.9	35.7	26.3	22.6	12.4	14.1	10.0	15.4	8.26	7.90	13.70	7.83	5.73	3.15	27.0	5.73
Fluoride	mg/L	1.5 (MAC)	0.490	0.730	<0.05	0.660	0.780	0.930	0.984	0.889	0.806	0.970	0.837	0.661	0.668	0.718	0.972	0.771
(Nitrate + Nitrite) as N	mg/L	10.0 (MAC)	0.10	<0.05	0.06	<0.07	<0.2	0.03	0.03	10.6	18.4	19.2	23.8	64.1	37.5	12.4	1.92	4.76
Nitrate as N	mg/L	10.0 (MAC)	0.10	<0.05	0.06	<0.25	<0.10	0.03	0.03	10.6	18.4	19.2	23.8	64.1	37.5	12.4	1.92	4.76
Nitrite as N	mg/L	1.0 (MAC)	<0.05	<0.05	<0.05	<0.25	<0.10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate as P	mg/L	NV	<0.1	<0.1	<0.1	<0.5	0.0039	0.0146	0.0038	0.0031		0.0046	<0.0030	0.0047	0.0038	<0.0010	0.0025	0.0020
Sulphate	mg/L	500 (AO)	83.8	116.0	103.0	205.0	102.0	57.0	80.7	72.5	46.9	46.4	34.7	25.3	25.6	25.0	33.5	18.4
Dissolved Organic Carbon (DOC)	mg/L	5.0 (AO)	6.00	4.70	4.50	3.10	<1.0	1.10	3.40	1.30	1.70	1.74	2.12	2.26	0.96	1.84	1.08	1.65
Aluminum	mg/L	0.1 (OG)	0.0220	<0.004	0.0060	0.0140	<0.010	<0.010	0.0057	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0016	0.0024	0.0016	0.0018
Arsenic	mg/L	0.01 (IMAC)	<0.003	<0.003	<0.003	<0.003	<0.0010	0.00046	0.00046	0.00046	0.00046	0.00046	0.00027	0.00043	0.00040	0.00044	0.00045	0.0004
Barium	mg/L	1.0 (MAC)	0.138	0.125	0.14	0.068	0.08	0.119	0.0815	0.0646	0.099	0.0884	0.0875	0.131	0.13	0.0997	0.114	0.116
Boron	mg/L	5.0 (MAC)	0.059	0.033	0.025	0.028	0.021	0.026	0.019	0.015	0.014	0.012	0.011	0.011	0.012	<0.010	<0.010	<0.010
Cadmium	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.000090	<0.000090	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000050	<0.000050	<0.000006	<0.000050
Calcium	mg/L	NV	100	91.8	91.2	84.9	82.1	88.7	71.5	63		81.3	81.6	109	105	81.8	92.8	86.7
Chromium	mg/L	0.05 (MAC)	<0.003	0.003	<0.003	<0.003	0.00123	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper	mg/L	1.0 (AO)	<0.003	<0.003	<0.003	<0.003	<0.0010	<0.0010	0.00062	0.00073	0.00053	0.00055	0.0239	0.00064	0.00044	0.001	0.00092	0.00075
Iron	mg/L	0.3 (AO)	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Lead	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.00050	<0.00050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000273	<0.000050	<0.000050	<0.000050	<0.000050
Magnesium	mg/L	NV	47.6	37.8	38.0	33.0	27.9	34.2	27.0	22.4		29.6	28.2	31.0	32.1	25.0	23.8	25
Manganese	mg/L	0.05 (AO)	0.073	0.025	0.013	<0.002	<0.0010	<0.0010	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	0.0006	0.00015	0.00024	0.00044	0.00011
Potassium	mg/L	NV	6.80	2.90	2.48	2.29	1.70	1.80	1.68	1.63		1.90	1.66	1.49	1.40	1.41	1.14	1.29
Selenium	mg/L	0.05 (MAC)	<0.004	<0.004	<0.004	<0.004	0.0016	0.00087	0.00147	0.00255	0.00154	0.00243	0.00227	0.00139	0.00118	0.00166	0.000714	0.00101
Silicon	mg/L	NV	5.46	6.21	5.80	4.94	6.60	6.00	5.23	4.76		5.67	5.51	5.72	6.00	5.92	6.39	6.2
Sodium	mg/L	200 (AO)	17.6	65.1	48.8	92.1	105	66	71.1	69.5	68.9	59.5	53.2	42.6	29.1	26.8	20.8	20
Zinc	mg/L	5.0 (AO)	0.0600	<0.004	<0.004	0.0060	<0.0030	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.0157	0.0011	<0.0010	<0.0010	<0.0010	<0.0010

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5. Blank denotes data not available.  
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**TABLE D-3**  
**GROUNDWATER ANALYTICAL RESULTS - GENERAL PARAMETERS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Parameter	Unit	ODWS	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D
			May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24	May-25
Field Electrical Conductivity	uS/cm	NV	478	458	484	491	478	482	590	465	488	430	492	476	740	706	530	
Total Hardness (as CaCO3)	mg/L	80-100 (OG)	205	209	201	204	233	226	219	209	222	228	230	201	218	222	234	235
pH	N/A	6.5-8.5 (OG)	8.04	8.22	8.32	8.24	8.16	8.19	8.25	8.08	306	8.02	7.96	8.04	8.24	8.23	8.36	8.31
Total Dissolved Solids	mg/L	500 (AO)	278	254	242	232	261	271	309	274	325	289	285	250	259	226	334	
Alkalinity, Bicarbonate (as CaCO3)	mg/L	NV	251	255	249	252	255	266	252	266	258	465	260	259	399	139	277	
Alkalinity, Carbonate (as CaCO3)	mg/L	NV	<5	<5	6	<5	<10	<10	<10	<10	<10	<2.0	<2.0	<1.0	<1.0	2.0	3.7	
Alkalinity, Total (as CaCO3)	mg/L	30-500 (OG)	251	255	255	252	258	266	252	266	247	258	465	260	259	399	141	281
Ammonia, Total (as N)	mg/L	NV	0.090	0.030	0.160	0.060	<0.050	0.096	0.088	0.089	0.074	0.015	0.130	0.138	0.047	<0.0050	0.026	
Bromide	mg/L	NV	<0.05	<0.05	<0.05	<0.05	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Chloride	mg/L	250 (AO)	9.5	5.3	4.3	4.4	4.3	5.1	5.3	6.6	7.0	7.9	10.7	9.2	10.0	11.6	2.29	12.1
Fluoride	mg/L	1.5 (MAC)	1.30	1.43	0.71	1.32	1.42	1.54	1.48	1.53	1.55	1.52	1.44	1.54	1.52	1.38	1.54	
(Nitrate + Nitrite) as N	mg/L	10.0 (MAC)	<0.05	0.07	<0.05	0.08	<0.2	0.05	0.03	<0.022	<0.022	<0.022	<0.022	<0.022	<0.0224	0.04	0.0710	<0.0224
Nitrate as N	mg/L	10.0 (MAC)	<0.05	0.07	<0.05	0.08	<0.10	0.04	0.03	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.04	0.071	<0.020
Nitrite as N	mg/L	1.0 (MAC)	<0.05	<0.05	<0.05	<0.05	<0.10	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate as P	mg/L	NV	<0.1	<0.1	<0.1	<0.1	0.0052	0.0054	0.0051	0.0036	0.0046	<0.0030	<0.0030	<0.0030	0.0042	0.0033	0.0075	0.0014
Sulphate	mg/L	500 (AO)	14.9	7.3	12.0	7.2	11.2	10.5	10.7	7.2	7.9	11.7	11.4	7.0	8.0	10.4	46.2	14.2
Dissolved Organic Carbon (DOC)	mg/L	5.0 (AO)	16.1	1.50	3.00	1.00	<1.0	<1.0	2.50	<1.0	<1.0	1.13	1.49	1.47	<0.50	1.20	1.77	0.97
Aluminum	mg/L	0.1 (OG)	0.0150	0.0060	0.0080	0.0070	0.3050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0014	0.0048	0.002	0.0223
Arsenic	mg/L	0.01 (IMAC)	0.006	0.007	0.004	0.008	0.0022	0.0055	0.00712	0.00782	0.00692	0.00632	0.00444	0.00886	0.00879	0.00482	0.00664	0.00329
Barium	mg/L	1.0 (MAC)	0.059	0.044	0.047	0.044	0.0427	0.0486	0.048	0.0441	0.0456	0.046	0.0429	0.0535	0.0505	0.0467	0.051	0.0437
Boron	mg/L	5.0 (MAC)	0.127	0.114	0.123	0.111	0.118	0.110	0.097	0.103	0.107	0.115	0.105	0.102	0.095	0.095	0.102	0.114
Cadmium	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.000090	<0.000090	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium	mg/L	NV	42.3	37.2	34.5	36.2	43.7	39.9	38.1	37.6	41.5	41	37.1	36.4	38.5	41.1	40.6	
Chromium	mg/L	0.05 (MAC)	<0.003	<0.003	<0.003	<0.003	0.00097	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper	mg/L	1.0 (AO)	<0.003	<0.003	<0.003	<0.003	<0.0010	<0.0010	0.00026	<0.00020	0.00031	0.00025	0.00044	0.00022	<0.00020	0.00031	0.00037	0.00037
Iron	mg/L	0.3 (AO)	0.018	0.03	<0.01	0.04	0.297	<0.050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.016
Lead	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.00050	<0.00050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Magnesium	mg/L	NV	24.2	28.3	28.0	27.7	30.0	30.7	30.1	28.0	30.2	31.1	26.2	30.8	30.6	32.0	32.4	
Manganese	mg/L	0.05 (AO)	0.045	0.011	0.007	0.01	0.0131	0.0058	0.00831	0.0111	0.00603	0.00936	0.00084	0.0147	0.0115	0.00231	0.00813	0.00069
Potassium	mg/L	NV	29.50	2.42	2.37	1.97	2.20	1.70	1.51	1.45	1.43	1.55	1.23	1.26	1.44	1.43	1.49	
Selenium	mg/L	0.05 (MAC)	<0.004	<0.004	<0.004	<0.004	<0.00040	<0.00040	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon	mg/L	NV	6.27	6.04	6.33	6.59	7.50	7.70	6.78	6.72	7.34	6.49	6.56	7.16	6.63	6.92	6.45	
Sodium	mg/L	200 (AO)	4.12	23.4	23.7	21.8	24.2	23.8	21.6	20.5	22.3	23.1	24.6	18.8	21.4	23	23.5	25.5
Zinc	mg/L	5.0 (AO)	0.0070	0.0190	<0.004	<0.005	<0.0030	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0021	<0.0010	<0.0010	<0.0010	<0.0010

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**TABLE D-3**  
**GROUNDWATER ANALYTICAL RESULTS - GENERAL PARAMETERS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Parameter	Unit	ODWS	Jeffery	Lachnit	Skinner	Skinner	Dorssers	Dorssers	Dorssers
			Jul-08	Jul-08	Jul-08	May-09	May-23	May-24	May-25
Field Electrical Conductivity	uS/cm	NV	521	367	910	824	629	937	878
Total Hardness (as CaCO3)	mg/L	80-100 (OG)	<b>242</b>	<b>162</b>	<b>468</b>	<b>381</b>	<b>483</b>	<b>477</b>	<b>464</b>
pH	N/A	6.5-8.5 (OG)	8.47	<b>8.68</b>	8.34	8.17	7.92	8.21	7.86
Total Dissolved Solids	mg/L	500 (AO)	316	202	<b>532</b>	462	<b>514</b>	<b>581</b>	<b>593</b>
Alkalinity, Bicarbonate (as CaCO3)	mg/L	NV	217	138	392	351	315	299	291
Alkalinity, Carbonate (as CaCO3)	mg/L	NV	19	57	12	<5	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	30-500 (OG)	236	196	404	351	315	299	291
Ammonia, Total (as N)	mg/L	NV	<0.02	0.030	<0.02	<0.02	<0.0050	<0.0050	<0.0050
Bromide	mg/L	NV	<0.05	<0.05	<0.05	<0.05	<0.10	<0.10	<0.20
Chloride	mg/L	250 (AO)	4.7	5.7	39.1	36.0	13.2	14.2	14.4
Fluoride	mg/L	1.5 (MAC)	1.49	<b>1.51</b>	0.34	0.12	<b>1.88</b>	<b>1.68</b>	<b>1.90</b>
(Nitrate + Nitrite) as N	mg/L	10.0 (MAC)	0.12	<0.05	8.54	8.03	0.07	0.0520	0.0790
Nitrate as N	mg/L	10.0 (MAC)	0.12	<0.05	8.54	8.03	0.07	0.052	0.079
Nitrite as N	mg/L	1.0 (MAC)	<0.05	<0.05	<0.05	<0.05	<0.010	<0.010	<0.020
Orthophosphate as P	mg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.0010	<0.0010	<0.0010
Sulphate	mg/L	500 (AO)	46.3	10.8	18.4	17.1	164	169	174
Dissolved Organic Carbon (DOC)	mg/L	5.0 (AO)	1.10	0.90	2.60	2.60	0.81	0.59	0.53
Aluminum	mg/L	0.1 (OG)	0.0440	<0.004	0.0090	0.0170	<0.0030	<0.0300	<0.0030
Arsenic	mg/L	0.01 (IMAC)	0.005	0.007	<0.003	<0.003	0.00017	<0.00100	0.00018
Barium	mg/L	1.0 (MAC)	0.11	0.056	0.142	0.106	0.0515	0.0535	0.0528
Boron	mg/L	5.0 (MAC)	0.083	0.089	0.039	0.026	0.076	0.100	0.085
Cadmium	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	0.0000286	<0.0000500	0.0000283
Calcium	mg/L	NV	53.2	32.1	138	117	123	114	114
Chromium	mg/L	0.05 (MAC)	0.003	<0.003	0.003	<0.003	<0.00050	<0.00500	<0.00050
Copper	mg/L	1.0 (AO)	0.037	0.007	0.005	0.004	0.0265	0.00738	0.0189
Iron	mg/L	0.3 (AO)	<b>0.365</b>	<b>0.316</b>	0.069	0.018	<0.010	<0.100	<0.010
Lead	mg/L	0.01 (MAC)	0.003	<0.002	<0.002	<0.002	0.00141	<0.000500	0.00039
Magnesium	mg/L	NV	26.5	19.8	29.9	21.6	42.8	46.7	43.6
Manganese	mg/L	0.05 (AO)	0.017	0.007	0.005	0.002	0.00051	0.00166	0.00071
Potassium	mg/L	NV	1.11	0.94	3.45	4.24	1.00	1.03	1.00
Selenium	mg/L	0.05 (MAC)	<0.004	<0.004	<0.004	<0.004	0.000633	<0.000500	0.000537
Silicon	mg/L	NV	5.03	4.37	4.82	4.23	5.06	4.64	5.18
Sodium	mg/L	200 (AO)	21.1	20.5	22.9	25.3	23.6	29.3	25.5
Zinc	mg/L	5.0 (AO)	2.940	0.005	0.671	0.424	0.0949	0.0415	0.065

- Notes:
1. ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, Conservation and Parks, as updated 2018.
  2. OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.
  3. < denotes analyte concentration is below the reportable detection limit (RDL) or the method reporting limit (MRL).
  4. Bold and Shaded denotes exceedances of the ODWS.
  5. Blank denotes data not available.
  6. Unless otherwise stated, units are reported in mg/L.
  7. NV denotes No Value

**Table D-4**  
**Groundwater Analytical Results – Volatile Organic Compounds**

**TABLE D-4  
GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS  
Hibbert Landfill  
County Road 24, Municipality of West Perth**

Parameter	Unit	ODWS	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S	MW2S
			May-06	May-07	Jun-08	May-09	May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24	May-25
Acetone		NV	<0.5	<0.5	<0.5	<1	<1	<1	<1	<1	<1	31	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzene	µg/L	1 (MAC)	<b>0.65</b>	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50
Bromofom	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50
Bromomethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Tetrachloride	µg/L	2 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.20
Chlorobenzene	µg/L	80 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50
Chloroethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50
Chloroform	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<2.0	<0.50
Chloromethane	µg/L	NV	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<2.0	<2.0
Ethylene Dibromide	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	µg/L	200 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	µg/L	5 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	µg/L	NV																		<1.0	<1.0	<0.50
1,1-Dichloroethane	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	µg/L	5 (IMAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	µg/L	14 (MAC)	<0.2	<0.2	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	µg/L	50 (MAC)	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30	<0.30
Ethylbenzene	µg/L	2.4 (AO)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Hexane	µg/L	NV										<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<b>0.58</b>	<0.50
2-Hexanone	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Ethyl Ketone	µg/L	NV	<0.9	<0.9	<0.9	<1	<1	<1	<1	<1	<1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Isobutyl Ketone	µg/L	NV	<0.3	<0.3	<0.3	<1	<1	<1	<1	<1	<1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl tert-butyl ether	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2,2-Tetrachloroethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene	µg/L	10 (MAC)	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	µg/L	24 (AO)	<b>0.68</b>	<b>0.44</b>	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<b>0.55</b>	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<10	<10	<10	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	µg/L	5 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	µg/L	NV	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50
Vinyl Chloride	µg/L	1 (MAC)	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20
o-Xylene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30	<0.30
m & p-Xylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.40	<0.40	<0.40
Xylenes (Total)	µg/L	90 (AO)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50

Notes: 1. ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, Conservation and Parks, as updated 2018.  
2. OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.  
3. < denotes analyte concentration is below the reportable detection limit (RDL) or the method reporting limit (MRL).  
4



**TABLE D-4  
GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS  
Hibbert Landfill  
County Road 24, Municipality of West Perth**

Parameter	Unit	ODWS	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3
			May-06	Jun-08	May-09	May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24	May-25
Acetone		NV	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzene	µg/L	1 (MAC)	<b>0.24</b>	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Tetrachloride	µg/L	2 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	µg/L	80 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	µg/L	NV	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylene Dibromide	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	µg/L	200 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	µg/L	5 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	µg/L	NV														<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	µg/L	5 (IMAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethene	µg/L	14 (MAC)	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-dichloroethylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	µg/L	50 (MAC)	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichloropropane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30	<0.30	<0.30	<0.30
Ethylbenzene	µg/L	2.4 (AO)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Hexane	µg/L	NV									<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Hexanone	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Ethyl Ketone	µg/L	NV	<0.9	<0.9	<1	<1	<1	<1	<1	<1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Isobutyl Ketone	µg/L	NV	<0.3	<0.3	<1	<1	<1	<1	<1	<1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl tert-butyl ether	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene	µg/L	10 (MAC)	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	µg/L	24 (AO)	<b>0.42</b>	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	<0.40	<0.40	<0.40
1,2,4-Trichlorobenzene	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<10	<10	<10	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	µg/L	5 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	µg/L	NV	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	µg/L	1 (MAC)	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
o-Xylene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30	<0.30	<0.30	<0.30
m & p-Xylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes(Total)	µg/L	90 (AO)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50

Notes: 1. ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, Conservation and Parks, as updated 2018.  
2. OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.  
3. < denotes analyte concentration is below the reportable detection limit (RDL) or the method reporting limit (MRL).  
4. Bold denotes parameter detected above laboratory detection limit.  
5. Shaded denotes exceedances of the ODWS.  
6. Blank denotes data not available.  
7. Unless otherwise stated, units are reported in mg/L.  
8. NV denotes No Value

**TABLE D-4**  
**GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Parameter	Unit	ODWS	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S	MW5S
			May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24	May-25
Acetone		NV	<1	<1	<1	<1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzene	µg/L	1 (MAC)	<b>0.35</b>	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50
Bromofom	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50
Bromomethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Tetrachloride	µg/L	2 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	µg/L	80 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50
Chloroethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50
Chloroform	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<2.0	<0.50	<0.50
Chloromethane	µg/L	NV	<0.4	<0.4	<0.4	<0.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<0.50	<2.0	<2.0
Ethylene Dibromide	µg/L	NV	<0.2	<0.2	<0.1	<0.1	<0.50	<0.50	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	µg/L	200 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	µg/L	5 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	µg/L	NV											<1.0	<1.0	<1.0	<0.50	<0.50	<0.50
1,1-Dichloroethane	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	µg/L	5 (IMAC)	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethene	µg/L	14 (MAC)	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-dichloroethylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	µg/L	50 (MAC)	<0.3	<0.3	<0.3	<0.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Ethylbenzene	µg/L	2.4 (AO)	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Hexane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Hexanone	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Ethyl Ketone	µg/L	NV	<1	<1	<1	<1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Isobutyl Ketone	µg/L	NV	<1	<1	<1	<1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl tert-butyl ether	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2,2-Tetrachloroethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene	µg/L	10 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	µg/L	24 (AO)	<b>0.7</b>	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	<0.50	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<10	<10	<10	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	µg/L	5 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	µg/L	NV	<0.4	<0.4	<0.4	<0.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50
Vinyl Chloride	µg/L	1 (MAC)	<0.17	<0.17	<0.17	<0.17	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20
o-Xylene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
m & p-Xylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes(Total)	µg/L	90 (AO)	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Notes: 1. ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, Conservation and Parks, as updated 2018.  
2. OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.  
3. < denotes analyte concentration is below the reportable detection limit (RDL) or the method reporting limit (MRL).  
4. Bold denotes parameter detected above laboratory detection limit.  
5. Shaded denotes exceedances of the ODWS.  
6. Blank denotes data not available.  
7. Unless otherwise states, units are reported in µg/L.  
8. NV denotes No Value

**TABLE D-4**  
**GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Parameter	Unit	ODWS	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D	MW5D
			May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24
Acetone		NV	<1	<1	<1	<1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzene	µg/L	1 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Tetrachloride	µg/L	2 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	µg/L	80 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	µg/L	NV	<0.4	<0.4	<0.4	<0.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylene Dibromide	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	µg/L	200 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	µg/L	5 (MAC)	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	µg/L	NV										<1.0	<1.0	<1.0	<0.50	<0.50	<0.50
1,1-Dichloroethane	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	µg/L	5 (IMAC)	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	µg/L	14 (MAC)	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-dichloroethylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	µg/L	50 (MAC)	<0.3	<0.3	<0.3	<0.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30	<0.30	<0.30	<0.30
Ethylbenzene	µg/L	2.4 (AO)	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Hexane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Hexanone	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Ethyl Ketone	µg/L	NV	<1	<1	<1	<1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Isobutyl Ketone	µg/L	NV	<1	<1	<1	<1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl tert-butyl ether	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene	µg/L	10 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	µg/L	24 (AO)	<b>0.41</b>	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	µg/L	NV	<0.3	<0.3	<0.3	<0.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	µg/L	5 (MAC)	<0.2	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	µg/L	NV	<0.4	<0.4	<0.4	<0.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	µg/L	1 (MAC)	<0.17	<0.17	<0.17	<0.17	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20
o-Xylene	µg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30	<0.30	<0.30	<0.30
m & p-Xylene	µg/L	NV	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes (Total)	µg/L	90 (AO)	<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50

Notes: 1. ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, Conservation and Parks, as updated 2018.  
2. OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.  
3. < denotes analyte concentration is below the reportable detection limit (RDL) or the method reporting limit (MRL).  
4. Bold denotes parameter detected above laboratory detection limit.  
5. Shaded denotes exceedances of the ODWS.  
6. Blank denotes data not available.  
7. Unless otherwise stated, units are reported in mg/L.  
8. NV denotes No Value

**TABLE D-4**  
**GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Parameter	Unit	ODWS	Skinner	Dorssers	Dorssers	Dorssers
			May-09	May-23	May-24	May-25
Acetone		NV	<1	<20	<20	<20
Benzene	µg/L	1 (MAC)	<0.2	<0.50	<0.50	<0.50
Bromodichloromethane	µg/L	NV	<0.2	<0.50	<0.50	<0.50
Bromoform	µg/L	NV	<0.1	<0.50	<0.50	<0.50
Bromomethane	µg/L	NV	<0.2	<0.50	<0.50	<0.50
Carbon Tetrachloride	µg/L	2 (MAC)	<0.2	<0.20	<1.0	<0.20
Chlorobenzene	µg/L	80 (MAC)	<0.1	<0.50	<0.50	<0.50
Dibromochloromethane	µg/L	NV	<0.1	<0.50	<0.50	<0.50
Chloroethane	µg/L	NV	<0.2	<0.50	<0.20	<0.50
Chloroform	µg/L	NV	<0.2	<2.0	<0.50	<0.50
Chloromethane	µg/L	NV	<0.4	<0.50	<2.0	<2.0
Ethylene Dibromide	µg/L	NV	<0.2	<0.20	<0.50	<0.20
1,2-Dichlorobenzene	µg/L	200 (MAC)	<0.1	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	µg/L	NV	<0.1	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	µg/L	5 (MAC)	<0.1	<0.50	<0.50	<0.50
Dichlorodifluoromethane		NV		<0.50	<0.50	<0.50
1,1-Dichloroethane	µg/L	NV	<0.3	<0.50	<0.50	<0.50
1,2-Dichloroethane	µg/L	5 (IMAC)	<0.2	<0.50	<0.50	<0.50
1,1-Dichloroethene	µg/L	14 (MAC)	<0.3	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	µg/L	NV	<0.2	<0.50	<0.50	<0.50
trans-1,2-dichloroethylene	µg/L	NV	<0.2	<0.50	<0.50	<0.50
Methylene Chloride	µg/L	50 (MAC)	<0.3	<1.0	<1.0	<1.0
1,2-Dichloropropane	µg/L	NV	<0.2	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	µg/L	NV	<0.2	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	µg/L	NV	<0.3	<0.30	<0.30	<0.30
Ethylbenzene	µg/L	2.4 (AO)	<0.1	<0.50	<0.50	<0.50
n-Hexane	µg/L	NV		<0.50	<0.50	<0.50
2-Hexanone	µg/L	NV	<0.3	<20	<20	<20
Methyl Ethyl Ketone	µg/L	NV	<1	<20	<20	<20
Methyl Isobutyl Ketone	µg/L	NV	<1	<20	<20	<20
Methyl tert-butyl ether	µg/L	NV	<0.2	<0.50	<0.50	<0.50
Styrene	µg/L	NV	<0.1	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	µg/L	NV	<0.1	<0.50	<0.50	<0.50
1,1,1,2,2-Tetrachloroethane	µg/L	NV	<0.1	<0.50	<0.50	<0.50
Tetrachloroethene	µg/L	10 (MAC)	<0.2	<0.50	<0.50	<0.50
Toluene	µg/L	24 (AO)	<0.2	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	µg/L	NV	<0.3	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	µg/L	NV	<0.3	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	µg/L	NV	<0.2	<0.50	<0.50	<0.50
Trichloroethylene	µg/L	5 (MAC)	<0.2	<0.50	<0.50	<0.50
Trichlorofluoromethane	µg/L	NV	<0.4	<0.50	<0.50	<0.50
Vinyl Chloride	µg/L	1 (MAC)	<0.17	<0.50	<0.50	<0.20
o-Xylene	µg/L	NV	<0.1	<0.30	<0.40	<0.30
m & p-Xylene	µg/L	NV	<0.2	<0.40	<0.30	<0.40
Xylenes(Total)	µg/L	90 (AO)	<0.2	<0.50	<0.50	<0.50

- Notes: 1. ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, Conservation and Parks, as updated 2018.  
2. OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acc  
3. < denotes analyte concentration is below the reportable detection limit (RDL) or the method reporting limit (MRL).  
4. Bold denotes parameter detected above laboratory detection limit.  
5. Shaded denotes exceedances of the ODWS.  
6. Blank denotes data not available.  
7. Unless otherwise states, units are reported in mg/L.  
8. NV denotes No Value

**Table D-5**  
**Surface Water Analytical Results – General Parameters**

**TABLE D-5**  
**SURFACE WATER ANALYTICAL RESULTS - GENERAL PARAMETERS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Parameter	Unit	PWQO	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW2	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1
			May-06	May-07	May-09	May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24
Field Electrical Conductivity	uS/cm	NV	541	474	547	561	563	547	546	244	244	610	476	933	464	502	505	422	482.2	561
Total Hardness (as CaCO3)	mg/L	NV	261	243	276	264	295	279	245	286	285	259	207	245	291	311	309	286	298	284
pH	N/A	6.5-8.5	8.42	8.48	8.47	8.3	8.31	8.18	8.36	8.14	8.25	8.34	8.05	7.91	8.2	8.25	8.31	8.42	8.10	8.35
Total Dissolved Solids	mg/L	NV	326	270	308	378	368	300	264	332	280	300	268	296	343	326	334	331	364	342
Alkalinity, Bicarbonate (as CaCO3)	mg/L	NV	207	154	232	232	230	253	220	243	244	225	181	215	241	240	256	262	254	220
Alkalinity, Carbonate (as CaCO3)	mg/L	NV	14	40	14	<5	<5	<5	<5	<10	<10	<10	<10	<10	<2.0	<2.0	10.7	<1.0	<1.0	6.3
Alkalinity, Total (as CaCO3)	mg/L	>25% Decrease	221	194	246	237	232	253	224	246	244	227	181	210	215	241	240	266	272	254
Ammonia, Total (as N)	mg/L	NV	<0.02	<0.02	<0.02	<0.02	0.02	0.06	0.17	0.114	<0.050	0.033	0.074	0.039	0.039	0.021	0.0144	0.0099	0.0214	0.0126
Bromide	mg/L	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chloride	mg/L	NV	17.6	17.9	13.1	21	23.5	19.6	19.5	18.5	21.6	17.6	13.5	25.2	20.6	27.1	30.7	28.5	24.8	25.8
Fluoride	mg/L	NV			0.1	<0.05	<0.05	<0.05	<0.1	0.14	0.207	0.186	0.13	0.141	0.193	0.2	0.162	0.143	0.134	0.180
Nitrate and Nitrite as N	mg/L	NV	6.64	5.84	5.34	13.4	11.2	<0.05	6.5	8.91	3.345	3.281	8.225	6.851	5.057	5.476	5.86	6.43	5.04	5.79
Nitrate as N	mg/L	NV	6.55	5.84	5.24	13.4	11.2	2.62	6.5	8.91	3.32	3.24	8.21	6.84	5.03	5.44	5.84	6.39	4.99	5.74
Nitrite as N	mg/L	NV	0.090	<0.05	0.060	<0.05	<0.05	2.620	<0.1	<0.10	0.025	0.041	0.015	0.011	0.027	0.036	0.021	0.039	0.049	0.046
Orthophosphate as P	mg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.0306	<0.0030	0.0061	0.068	0.0673	<0.0030	<0.0030	<0.0030	0.0148	0.0058	0.0050	
Sulphate	mg/L	NV	16.9	15.2	11.4	11.8	9.36	13.2	9.83	7.8	11.5	9.51	5.56	8.69	11	12.6	10	8.65	9.24	10.1
Dissolved Organic Carbon (DOC)	mg/L	NV	2.1	2.2	2.2	3.4	2.6	2.6	2.3	2.2	2.5	5.7	3.5	3.93	2.95	2.66	2.57	2.47	3.12	2.77
Dissolved Aluminum	mg/L	0.075	0.019	0.027	0.034	0.056	<b>0.138</b>	0.023	0.045	<b>0.11</b>	<0.010	0.0054	<b>1.76</b>	<0.0050	0.0337	0.0449	<0.0050	0.0018	0.0054	0.0214
Arsenic	mg/L	0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.0010	<0.0010	0.00043	0.00067	0.00023	0.00076	0.00025	0.00036	0.00023	0.00021	0.00038
Barium	mg/L	NV	0.025	0.039	0.035	0.036	0.032	0.039	0.025	0.0338	0.0372	0.0365	0.0332	0.0396	0.0361	0.0423	0.0366	0.0397	0.0418	0.0395
Boron	mg/L	0.2	0.029	0.016	0.018	0.015	0.014	0.013	<0.01	0.014	0.014	0.014	0.013	0.01	0.013	0.012	0.014	0.012	0.014	0.014
Cadmium	mg/L	0.0005	<0.0002	<0.0002	<0.0002	<b>&lt;0.001</b>	<0.0001	<0.0001	<0.0001	<0.000090	<0.000090	<0.000010	0.00004	<0.000010	0.000052	0.000086	0.0000122	0.0000184	0.0000117	0.0000081
Calcium	mg/L	NV	76.4	68.3	83.5	93.6	91.1	78.6	75.6	89.8	82.5	77.7	65.1	76	85.2	90.2	88.8	84.2	87.1	81.8
Chromium	mg/L	NV	<0.003	0.004	<0.003	<0.003	<0.003	<0.003	<0.003	0.00055	0.00063	<0.00050	0.00232	0.0028	<0.00050	<0.00050	0.00059	<0.00050	<0.00050	<0.00050
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	0.0011	<0.0010	<0.0010	0.0027	<0.0010	0.0029	0.0014	0.0014	0.00088	0.00099	0.00074
Iron	mg/L	0.3	0.249	<b>0.301</b>	<0.01	0.032	0.07	0.06	<0.01	0.219	0.098	0.163	<b>1.67</b>	0.063	<b>2.23</b>	0.093	0.023	0.088	0.058	0.050
Lead	mg/L	0.005	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.00050	<0.00050	<0.00010	0.00115	<0.00010	0.00132	0.000113	0.000182	0.000061	<0.00050	<0.00050
Magnesium	mg/L	NV	17.1	17.5	16.5	7.46	16.3	20	13.7	15	19.2	15.8	10.8	13.5	19.1	20.9	21.2	18.4	19.6	19.3
Manganese	mg/L	NV							0.009	0.0092	0.0286	0.0276		0.0371	0.0128	0.0165	0.0108	0.00702	0.00467	0.0161
Potassium	mg/L	NV	1.06	1.06	1.16	17	1.87	0.95	1.5	1.7	1.4	1.5	2.33	2.66	1.22	1.32	1.39	2.04	1.37	1.85
Selenium	mg/L	0.1								<0.00040	<0.00040	0.000267	0.000438	0.00044	0.000506	0.000424	0.00038	0.000347	0.000352	0.000216
Silicon	mg/L	NV							2.7	1.1	1.42	5.09	5.56	0.78	1.62	0.96	1.31	1.06	0.78	
Sodium	mg/L	NV	6.0	6.87	5.71	1.47	9.29	8.33	7.8	7.77	9.4	7.28	5.81	7.22	10.5	11.8	11	8.86	9.45	10.5
Zinc	mg/L	0.02	<0.004	<0.004	<b>0.046</b>	0.009	<0.005	<0.005	<0.005	<0.0030	<0.0030	<0.0030	0.0083	<0.0030	0.0108	<0.0030	<0.0030	<0.0030	<0.0030	0.0044

Notes: 1. PWQO denotes Provincial Water Quality Objectives of the Ministry of the Environment and Energy, as revised February 1999.  
2. < denotes analyte concentration is below the reportable detection limit (RDL) or the method reporting limit (MRL).  
3. Bold and shaded denotes exceedance of the PWQO.  
4. Blank denotes data not available.  
5. Bold, dotted and shaded denotes the limit of detection exceedance of the PWQO.  
6. NV denotes No Value

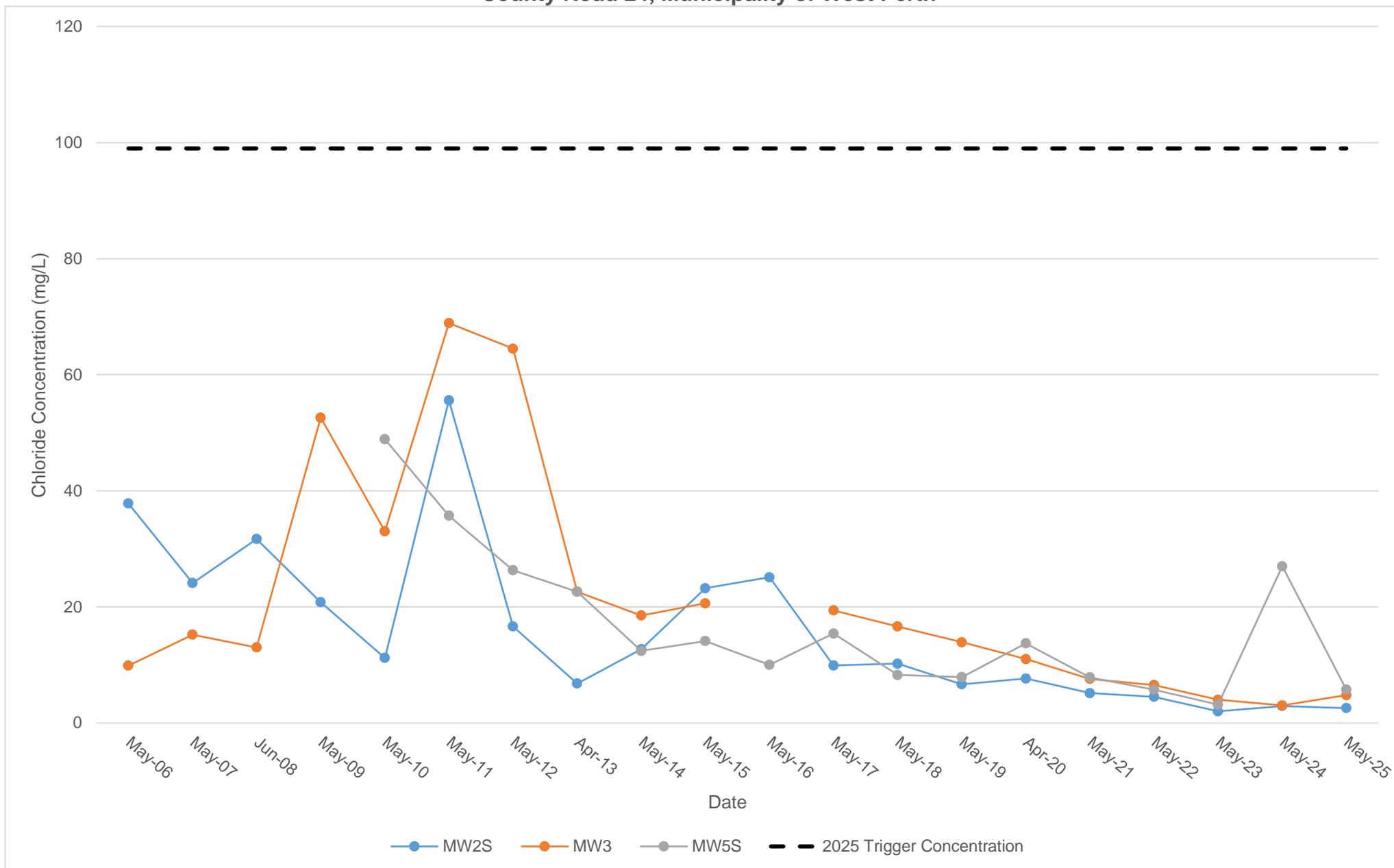
**TABLE D-5  
SURFACE WATER ANALYTICAL RESULTS - GENERAL PARAMETERS  
Hibbert Landfill  
County Road 24, Municipality of West Perth**

Parameter	Unit	PWQO	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2
			May-06	May-07	Jun-08	May-09	May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24	May-25	
Field Electrical Conductivity	uS/cm	NV	538	504	619	565	573	570	554	555	213	559	640	431	640	459	507	522	428	505	579		
Total Hardness (as CaCO3)	mg/L	NV	261	255	315	288	303	301	273	244	283	306	249	208	253	301	303	315	291	309	281		
pH	N/A	6.5-8.5	8.37	8.5	<b>8.62</b>	8.45	8.25	8.32	8.25	8.34	8.14	8.23	8.18	8.02	7.95	8.17	8.22	8.33	8.4	8.09	8.41		
Total Dissolved Solids	mg/L	NV	290	304	388	332	384	346	286	264	343	283	317	260	321	338	340	346	346	352	356		
Alkalinity, Bicarbonate (as CaCO3)	mg/L	NV	212	185	220	239	235	232	254	218	239	278	451	183	219	242	240	254	268	258	226		
Alkalinity, Carbonate (as CaCO3)	mg/L	NV	13.7	26	26	13	5	<5	<5	<10	<10	<10	<10	<10	<10	<2.0	<2.0	12.4	<1.0	<1.0	10.1		
Alkalinity, Total (as CaCO3)	mg/L	>25% Decrease	226	211	246	253	235	236	254	221	242	278	451	183	219	242	240	266	277	258	236		
Ammonia, Total (as N)	mg/L	NV	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.05	0.14	0.149	<0.050	0.106	0.136	0.031	0.039	0.021	0.0199	0.012	0.0214	0.0172		
Bromide	mg/L	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		
Chloride	mg/L	NV	19.9	20.2	24.3	15.5	23.3	24.2	21.5	21.4	22.2	23.1	19.4	15.6	27.8	21.8	29.4	32.6	30.6	26.8	24.1		
Fluoride	mg/L	NV			0.17	0.11	0.14	<0.05	<0.05	<0.1	0.13	0.213	0.184	0.132	0.134	0.192	0.198	0.158	0.147	0.168	0.181		
Nitrate and Nitrite as N	mg/L	NV	6.13	5.74	7.33	5.07	13.7	11.4	<0.05	6.81	9.52	3.398	3.235	8.236	7.252	5.178	5.606	5.96	6.91	5.34	6.04		
Nitrate as N	mg/L	NV	6.05	5.74	7.29	5.07	13.7	11.4	2.58	6.81	9.52	3.37	3.18	8.22	7.24	5.15	5.57	5.94	6.87	5.30	6.00		
Nitrite as N	mg/L	NV	0.080	<0.05	0.070	<0.05	<0.05	<0.05	2.580	<0.1	<0.10	0.028	0.055	0.016	0.012	0.028	0.036	0.022	0.038	0.044	0.044		
Orthophosphate as P	mg/L	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		0.0242	0.0072	0.0486	0.0495	0.0632	<0.0030	<0.0030	<0.0030	0.0139	0.0040	0.0079		
Sulphate	mg/L	NV	17	14.9	14.1	11	12	9.48	13.3	10	8.3	11.6	9.97	6.0	9.0	11.3	12.8	11.1	9.81	9.39	10.6		
Dissolved Organic Carbon (DOC)	mg/L	NV	2.1	2	2.8	2.3	3.5	2.8	2.7	2.7	1.7	2.5	6.5	3.6	3.64	3.22	3.01	2.41	2.70	2.20	2.66		
Dissolved Aluminum	mg/L	0.075	0.006	0.027	0.01	0.025	0.055	<b>0.152</b>	0.027	0.069	<b>0.107</b>	<0.010	0.0061	<b>1.56</b>	<0.0050	<0.0050	<0.0050	0.0027	0.0062	0.0205	0.0030		
Arsenic	mg/L	0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.0010	<0.0010	0.00049	0.0006	0.00024	0.00069	0.00027	0.00032	0.00027	0.00024	0.00028		
Barium	mg/L	NV	0.025	0.04	0.035	0.037	0.036	0.033	0.038	0.029	0.0339	0.0398	0.0371	0.0328	0.0413	0.0376	0.0412	0.0398	0.0409	0.0436	0.0399		
Boron	mg/L	0.2	0.022	0.019	0.025	0.012	0.016	0.013	0.014	<0.01	0.015	0.016	0.013	0.012	0.011	0.012	0.015	0.015	0.014	0.013	0.016		
Cadmium	mg/L	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<b>&lt;0.001</b>	<0.0001	<0.0001	<0.0001	<0.000090	<0.000090	0.000013	0.000038	0.00001	0.000051	0.000097	0.000079	0.0000183	0.0000136	0.0000960		
Calcium	mg/L	NV	75.7	72.5	95.9	86.9	105	93.1	77	75.3	89.4	89.5	73.8	64.9	78.6	88.3	86.7	91.3	86.4	90.4	81.5		
Chromium	mg/L	NV	<0.003	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0006	0.00078	0.0007	0.00204	0.00244	<0.00050	<0.00050	0.00083	<0.00050	<0.00050	<0.00050		
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0011	<0.0010	0.0013	0.0026	<0.0010	0.0025	<0.0010	0.0012	0.00116	0.00129	0.00094		
Iron	mg/L	0.3	0.23	<b>0.309</b>	0.203	0.042	0.016	0.07	0.06	<0.01	0.196	0.134	0.209	<b>1.47</b>	0.081	<b>1.88</b>	0.08	0.067	0.268	0.078	0.047		
Lead	mg/L	0.005	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.00050	<0.00050	0.00014	0.00095	<0.00010	0.00124	0.000069	0.000074	0.000188	0.000059	<0.000050		
Magnesium	mg/L	NV	17.4	17.9	18.4	17.2	9.84	16.7	19.7	13.5	14.6	20	15.6	11.2	13.9	19.5	21	21.1	18.3	20.3	18.9		
Manganese	mg/L	NV									0.0093	0.0263	0.0371	0.0239	0.0324	0.0103	0.00632	0.0178	0.00784	0.00466	0.00837		
Potassium	mg/L	NV	1.13	1.12	1.22	1.22	18.2	1.86	1.0	1.6	1.7	1.4	2.34	2.27	2.59	1.3	1.34	1.45	2.06	1.46	1.9		
Selenium	mg/L	0.1									<0.00040	<0.00040	0.000272	0.000439	0.00047	0.000504	0.000389	0.000363	0.000363	0.00039	0.000250		
Silicon	mg/L	NV									2.7	1.2	1.33	4.77	5.21	0.79	1.36	1.31	1.47	1.01	0.76		
Sodium	mg/L	NV	6.76	7.69	11.7	7.43	1.5	10.4	8.99	8.7	9.04	10.6	8.38	6.59	8.4	12.3	13.2	13.0	10.2	10.9	11.7		
Zinc	mg/L	0.02	<0.004	<0.004	0.007	0.004	<0.005	<0.005	<0.005	<0.005	<0.0030	<0.0030	<0.0030	0.0083	<0.0030	0.0097	<0.0030	<0.0030	0.0051	<0.0030	<0.0030		

Notes: 1. PWQO denotes Provincial Water Quality Objectives of the Ministry of the Environment and Energy, as revised February 1999.  
2. < denotes analyte concentration is below the reportable detection limit (RDL) or the method reporting limit (MRL).  
3. Bold and shaded denotes exceedance of the PWQO.  
4. Blank denotes data not available.  
5. Bold, dotted and shaded denotes the limit of detection exceedance of the PWQO.  
6. NV denotes No Value

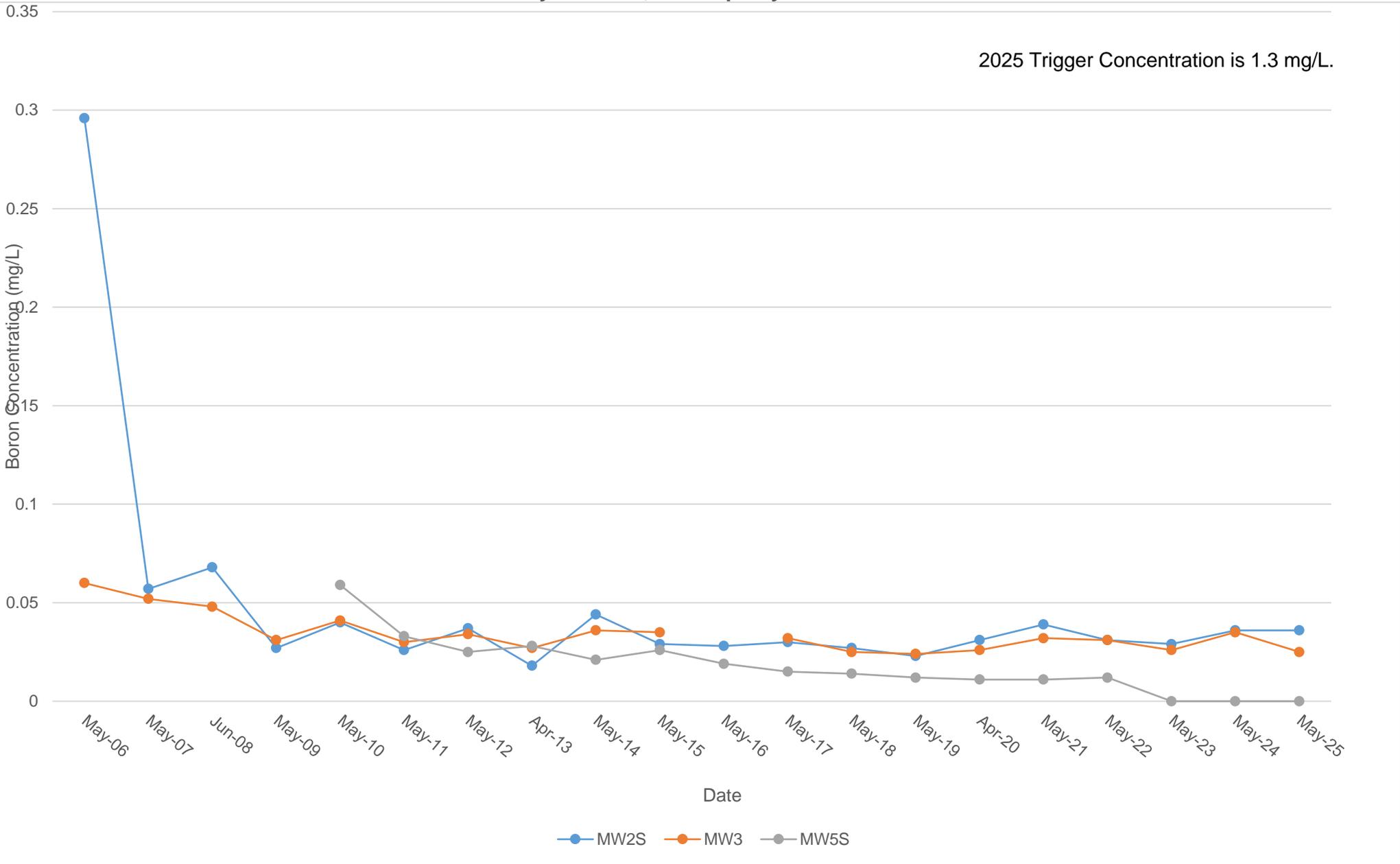
**Figure D-1**  
**Concentration vs. Time Plot – Chloride – Shallow Flow System**

**FIGURE D-1: CONCENTRATION VS. TIME PLOT**  
**CHLORIDE - SHALLOW FLOW SYSTEM**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**



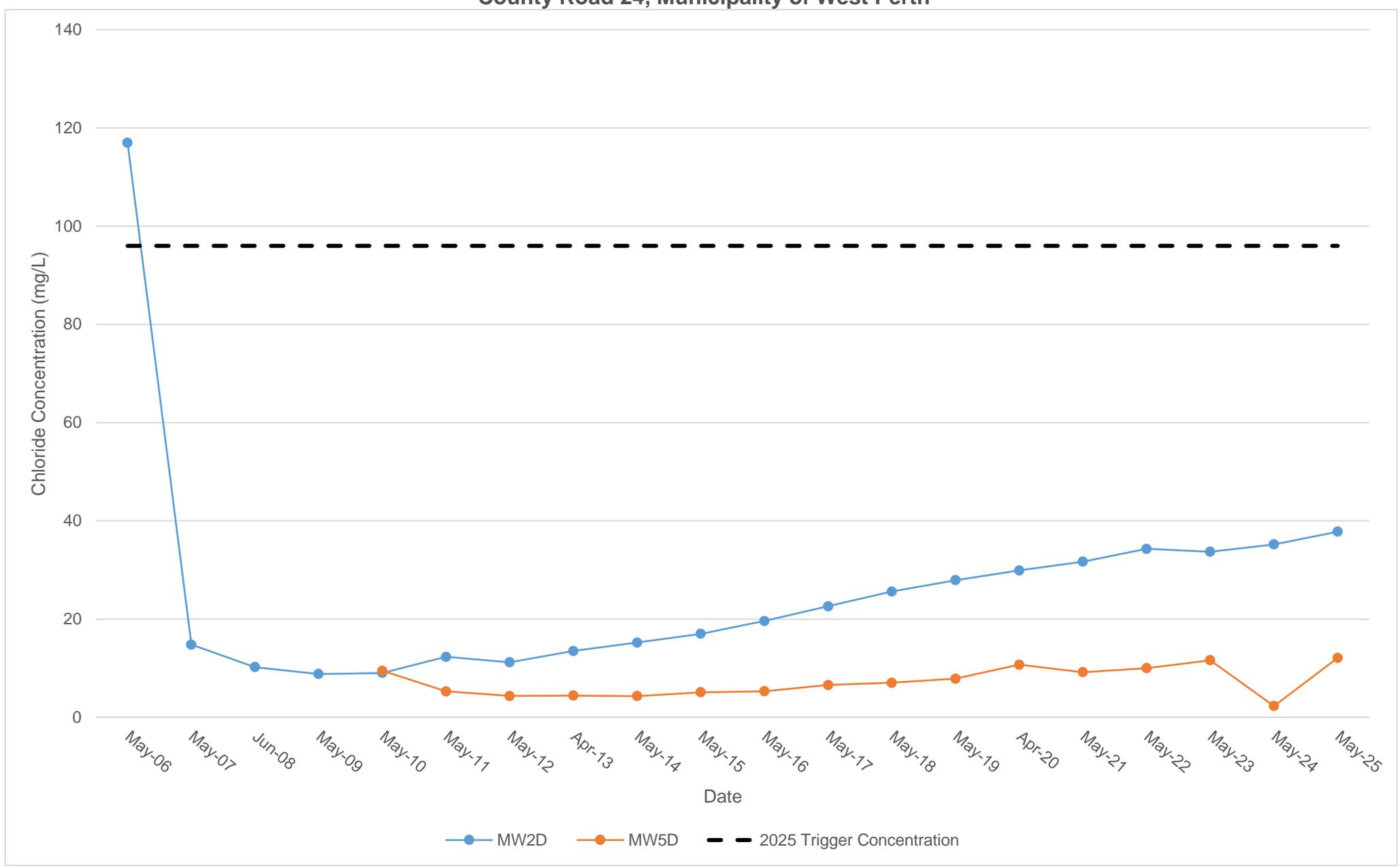
**Figure D-2**  
**Concentration vs. Time Plot – Boron – Shallow Flow System**

**FIGURE D-2: CONCENTRATION VS. TIME PLOT**  
**BORON - SHALLOW FLOW SYSTEM**  
Hibbert Landfill  
County Road 24, Municipality of West Perth



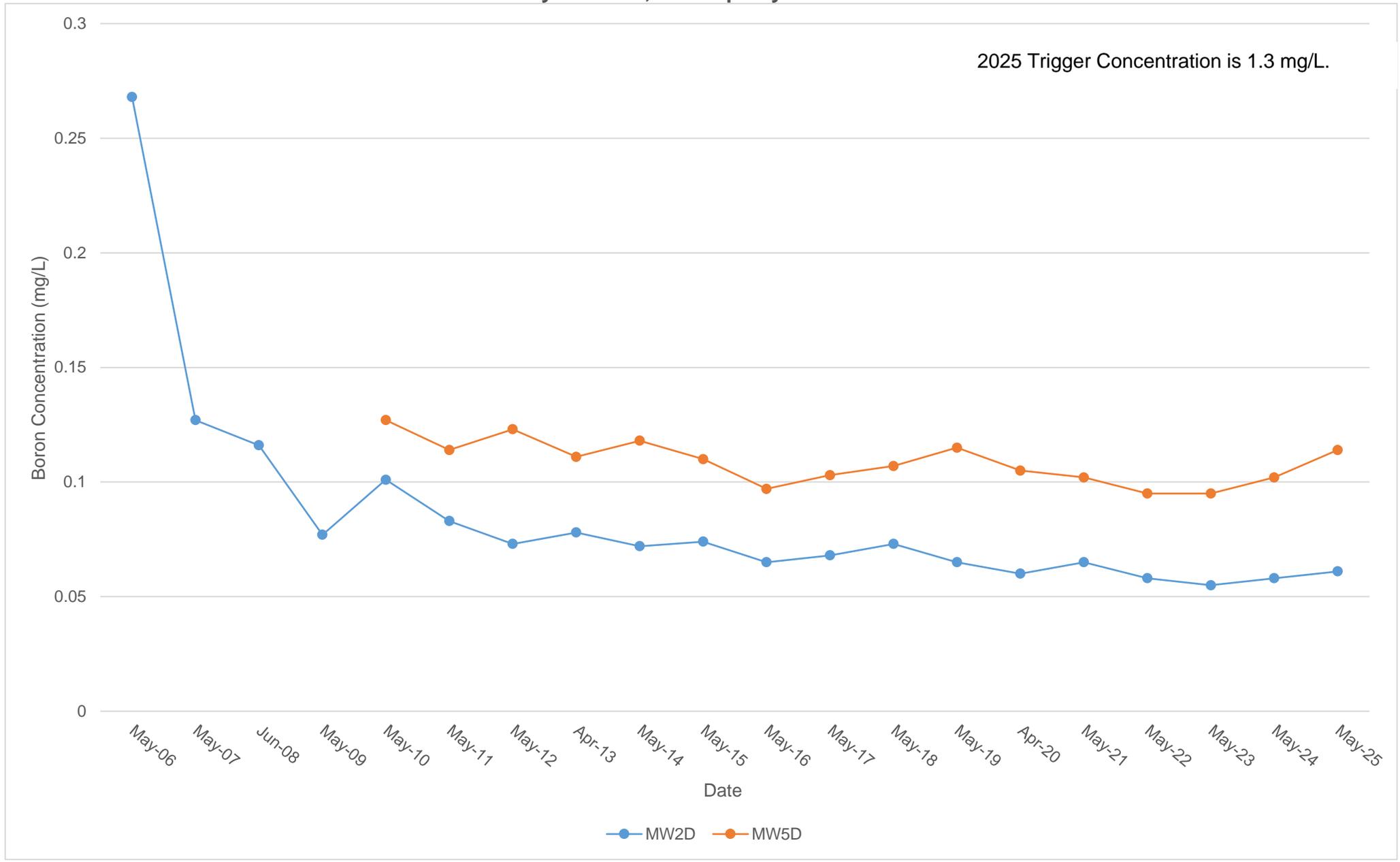
**Figure D-3**  
**Concentration vs. Time Plot – Chloride – Deep Flow System**

**FIGURE D-3: CONCENTRATION VS. TIME PLOT**  
**CHLORIDE - DEEP FLOW SYSTEM**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**



**Figure D-4**  
**Concentration vs. Time Plot – Boron – Deep Flow System**

**FIGURE D-4: CONCENTRATION VS. TIME PLOT**  
**BORON - DEEP FLOW SYSTEM**  
Hibbert Landfill  
County Road 24, Municipality of West Perth



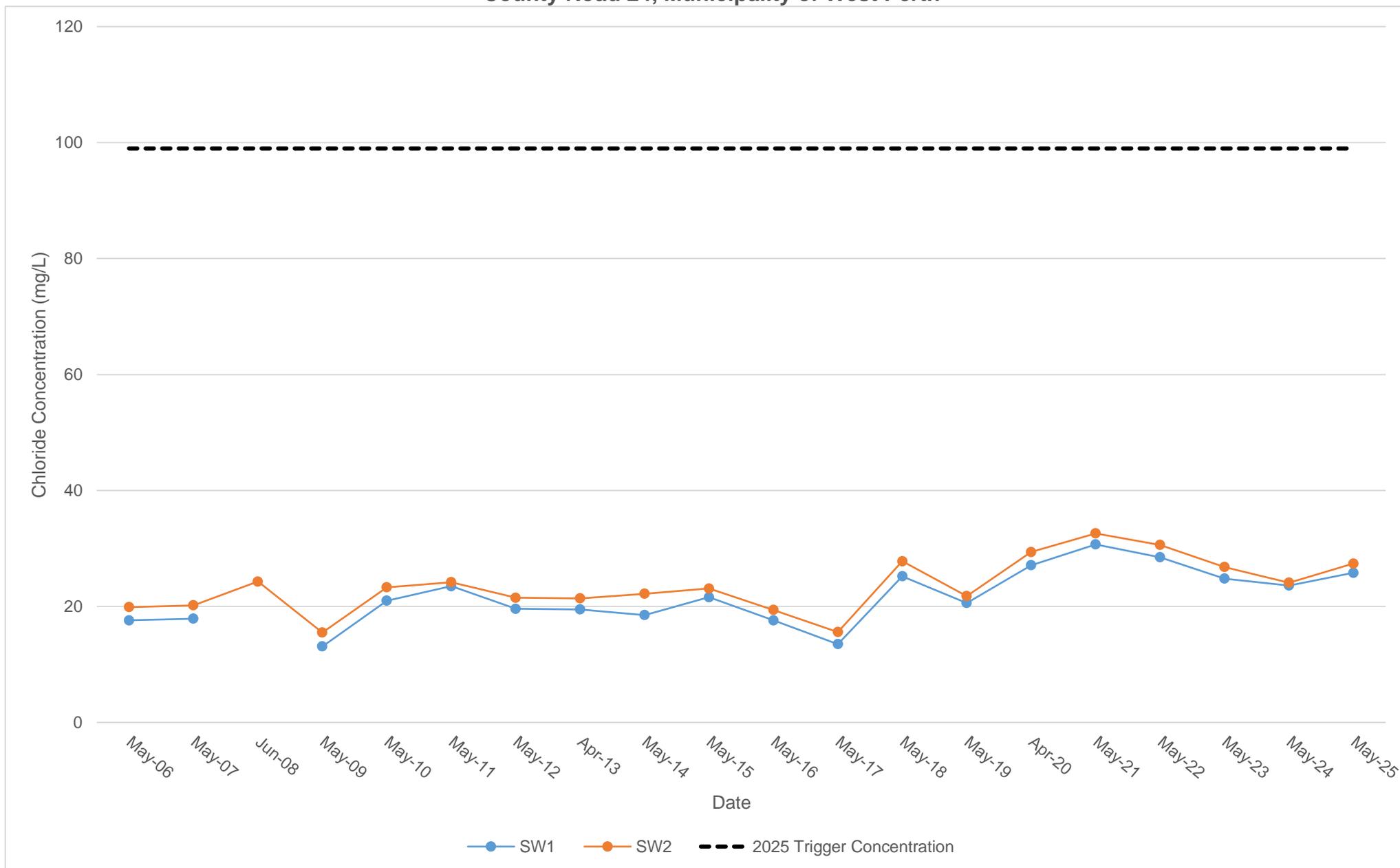
**Figure D-5**  
**Concentration vs. Time Plot – Chloride – Surface Water**

FIGURE D-5: CONCENTRATION VS. TIME PLOT

CHLORIDE - SURFACE WATER

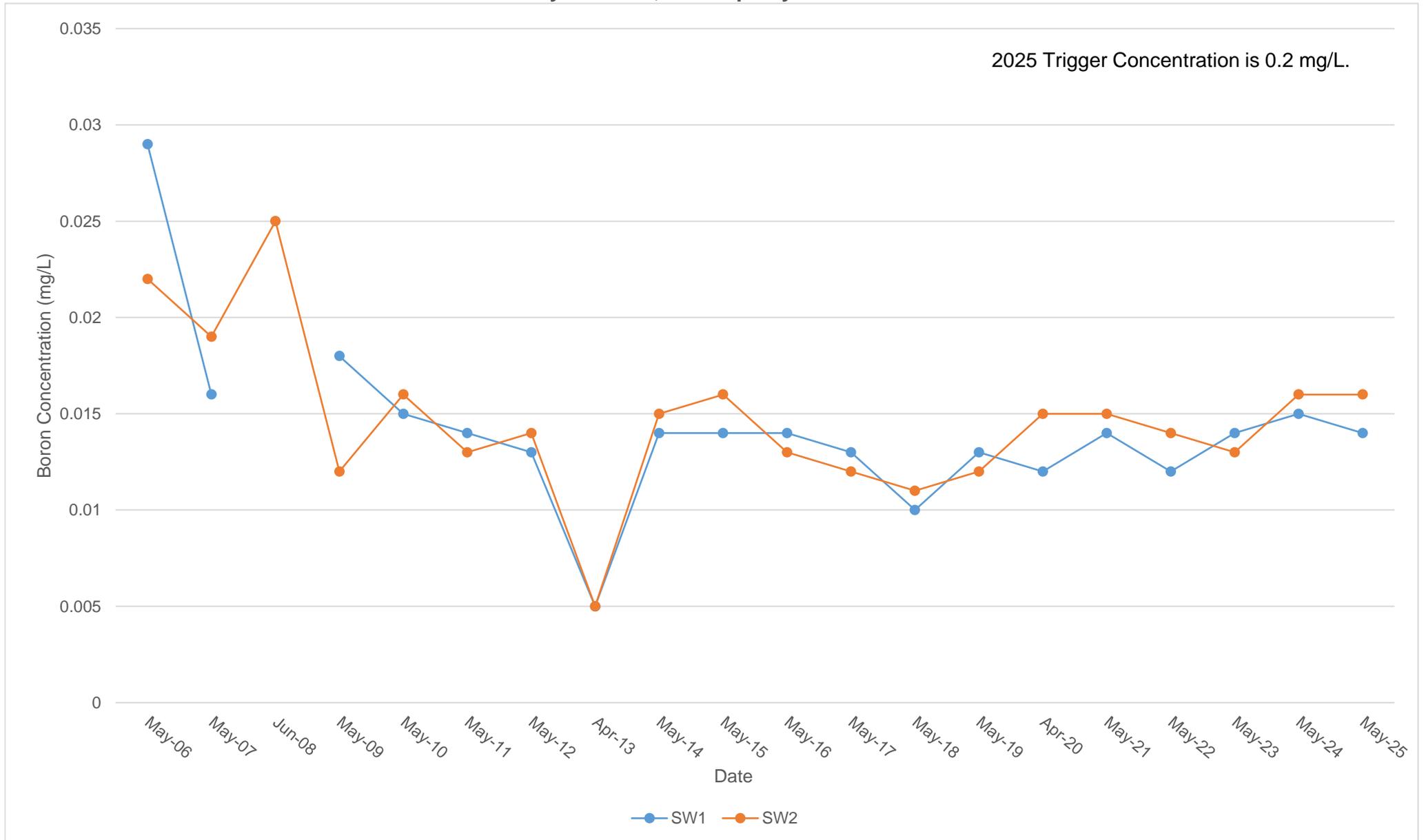
Hibbert Landfill

County Road 24, Municipality of West Perth



**Figure D-6**  
**Concentration vs. Time Plot – Boron – Surface Water**

**FIGURE D-6: CONCENTRATION VS. TIME PLOT**  
**BORON - SURFACE WATER**  
Hibbert Landfill  
County Road 24, Municipality of West Perth



**APPENDIX E**  
**Laboratory Certificates of Analysis**



**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	: <b>WT2510691</b>		
<b>Amendment</b>	: <b>2</b>		
<b>Client</b>	: <b>Pinchin Ltd.</b>	<b>Laboratory</b>	: ALS Environmental - Waterloo
<b>Contact</b>	: Deana Bettencourt	<b>Account Manager</b>	: Amanda Overholster
<b>Address</b>	: 225 Labrador Drive Unit #1 Waterloo Ontario Canada N2K 4M8	<b>Address</b>	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
<b>Telephone</b>	: ----	<b>E-mail</b>	: Amanda.Overholster@ALSGlobal.com
<b>Project</b>	: WEST PERTH HIBBERT GW	<b>Telephone</b>	: 1 416 817 2944
<b>PO</b>	: 333568.002	<b>Date Samples Received</b>	: 07-May-2025 16:30
<b>C-O-C number</b>	: ----	<b>Date Analysis Commenced</b>	: 08-May-2025
<b>Sampler</b>	: ML/DH	<b>Issue Date</b>	: 10-Jul-2025 13:50
<b>Site</b>	: West Perth		
<b>Quote number</b>	: West Perth Landfill		
<b>No. of samples received</b>	: 7		
<b>No. of samples analysed</b>	: 7		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

**Signatories**

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
David Tremblett		VOC, Waterloo, Ontario
Greg Pokocky		Inorganics, Waterloo, Ontario
Nik Perkio		Inorganics, Waterloo, Ontario
Walt Kippenhuck		Metals, Waterloo, Ontario
Walt Kippenhuck		Inorganics, Waterloo, Ontario
Walt Kippenhuck		Centralized Prep, Waterloo, Ontario



## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key: CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.  
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	no units
mg/L	milligrams per litre
pH units	pH units
µg/L	micrograms per litre

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

## Workorder Comments

Amendment (09/07/2025): This report has been amended following changes to the analytical data reported. The quality system is being utilised to resolve this issue. The specific data affected includes Alkalinity results.

Amendment (10/11/2025): This report has been amended following changes to the analytical data reported. The quality system is being utilised to resolve this issue. The specific data affected includes Alkalinity.



## Qualifiers

<u>Qualifier</u>	<u>Description</u>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
OWP	Organic water sample contained visible sediment (must be included as part of analysis). Measured concentrations of organic substances in water can be biased high due to presence of sediment.



## Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	MW1	MW2S	MW2D	MW3	MW4
					Client sampling date / time	07-May-2025 01:00	07-May-2025 01:10	07-May-2025 01:20	07-May-2025 01:30	07-May-2025 01:40
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510691-001	WT2510691-002	WT2510691-003	WT2510691-004	WT2510691-005	
					Result	Result	Result	Result	Result	
<b>Sample Preparation</b>										
Dissolved carbon filtration location	----	EP358/WT	-	-	field	field	field	field	field	
<b>Physical Tests</b>										
Alkalinity, bicarbonate (as CaCO3)	----	E290/WT	1.0	mg/L	6610	761	765	8790	749	
Alkalinity, carbonate (as CaCO3)	----	E290/WT	1.0	mg/L	<25.0 <sup>DLM</sup>	<1.0	<5.0 <sup>DLM</sup>	<25.0 <sup>DLM</sup>	<1.0	
Alkalinity, hydroxide (as CaCO3)	----	E290/WT	1.0	mg/L	<25.0 <sup>DLM</sup>	<1.0	<5.0 <sup>DLM</sup>	<25.0 <sup>DLM</sup>	<1.0	
Alkalinity, phenolphthalein (as CaCO3)	----	E290/WT	1.0	mg/L	<25.0 <sup>DLM</sup>	<1.0	<5.0 <sup>DLM</sup>	<25.0 <sup>DLM</sup>	<1.0	
Alkalinity, total (as CaCO3)	----	E290/WT	1.0	mg/L	6610	761	765	8790	749	
Hardness (as CaCO3), dissolved	----	EC100/WT	0.50	mg/L	388	444	279	398	342	
pH	----	E108/WT	0.10	pH units	7.47	7.49	8.01	7.58	7.91	
Solids, total dissolved [TDS]	----	E162/WT	10	mg/L	574 <sup>DLDS</sup>	556 <sup>DLDS</sup>	521 <sup>DLDS</sup>	676 <sup>DLDS</sup>	685 <sup>DLDS</sup>	
<b>Anions and Nutrients</b>										
Ammonia, total (as N)	7664-41-7	E298/WT	0.0050	mg/L	1.66	0.0145	0.0157	0.0353	0.830	
Bromide	24959-67-9	E235.Br/WT	0.10	mg/L	<0.50 <sup>DLM</sup>	<0.10	0.18	<0.10	<0.20 <sup>DLDS</sup>	
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L	43.9 <sup>DLM</sup>	2.55	37.8	4.78	24.6 <sup>DLDS</sup>	
Fluoride	16984-48-8	E235.F/WT	0.020	mg/L	0.332 <sup>DLM</sup>	0.324	0.985	0.181	0.238 <sup>DLDS</sup>	
Nitrite (as N)	14797-65-0	E235.NO2/WT	0.010	mg/L	<0.050 <sup>DLM</sup>	<0.010	<0.010	<0.010	0.069 <sup>DLDS</sup>	
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	0.0010	mg/L	0.0012	0.0017	0.0040	<0.0010	<0.0010	
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	0.30	mg/L	<1.50 <sup>DLM</sup>	7.15	34.6	5.59	2.08 <sup>DLDS</sup>	
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L	<0.100 <sup>DLM</sup>	1.03	0.027	0.095	<0.040 <sup>DLDS</sup>	
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	0.0200	mg/L	<0.112	1.03	0.0270	0.0950	0.0690	



## Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	MW1	MW2S	MW2D	MW3	MW4
					Client sampling date / time	07-May-2025 01:00	07-May-2025 01:10	07-May-2025 01:20	07-May-2025 01:30	07-May-2025 01:40
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510691-001	WT2510691-002	WT2510691-003	WT2510691-004	WT2510691-005	
					Result	Result	Result	Result	Result	
<b>Organic / Inorganic Carbon</b>										
<b>Carbon, dissolved organic [DOC]</b>	----	E358-L/WT	0.50	mg/L	3.61	2.48	1.70	3.61	3.47	
<b>Dissolved Metals</b>										
<b>Aluminum, dissolved</b>	7429-90-5	E421/WT	0.0010	mg/L	0.0118	0.0012	0.0041	0.0017	0.0137	
<b>Arsenic, dissolved</b>	7440-38-2	E421/WT	0.00010	mg/L	0.00041	0.00016	0.00062	0.00020	0.00076	
<b>Barium, dissolved</b>	7440-39-3	E421/WT	0.00010	mg/L	0.423	0.0968	0.0455	0.0690	0.267	
<b>Boron, dissolved</b>	7440-42-8	E421/WT	0.010	mg/L	0.167	0.036	0.061	0.025	0.313	
<b>Cadmium, dissolved</b>	7440-43-9	E421/WT	0.0000050	mg/L	<0.0000050	0.0000226	0.0000073	0.0000255	0.0000243	
<b>Calcium, dissolved</b>	7440-70-2	E421/WT	0.050	mg/L	114	142	66.1	124	85.9	
<b>Chromium, dissolved</b>	7440-47-3	E421/WT	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
<b>Copper, dissolved</b>	7440-50-8	E421/WT	0.00020	mg/L	<0.00020	0.00156	0.00059	0.00165	0.00112	
<b>Iron, dissolved</b>	7439-89-6	E421/WT	0.010	mg/L	5.08	0.010	<0.010	0.014	0.268	
<b>Lead, dissolved</b>	7439-92-1	E421/WT	0.000050	mg/L	0.000059	<0.000050	<0.000050	<0.000050	<0.000050	
<b>Magnesium, dissolved</b>	7439-95-4	E421/WT	0.0050	mg/L	25.2	21.6	27.6	21.4	30.9	
<b>Manganese, dissolved</b>	7439-96-5	E421/WT	0.00010	mg/L	0.122	0.00202	0.00028	0.0169	0.110	
<b>Potassium, dissolved</b>	7440-09-7	E421/WT	0.050	mg/L	7.37	0.536	1.99	0.178	11.5	
<b>Selenium, dissolved</b>	7782-49-2	E421/WT	0.000050	mg/L	0.000092	0.00478	0.000087	0.000411	0.000482	
<b>Silicon, dissolved</b>	7440-21-3	E421/WT	0.050	mg/L	7.21	3.02	5.85	2.33	4.78	
<b>Sodium, dissolved</b>	7440-23-5	E421/WT	0.050	mg/L	74.3	12.9	69.1	12.9	132	
<b>Zinc, dissolved</b>	7440-66-6	E421/WT	0.0010	mg/L	0.0396	0.0018	<0.0010	<0.0010	0.0019	
<b>Dissolved metals filtration location</b>	----	EP421/WT	-	-	Field	Field	Field	Field	Field	



## Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	MW1	MW2S	MW2D	MW3	MW4
					Client sampling date / time	07-May-2025 01:00	07-May-2025 01:10	07-May-2025 01:20	07-May-2025 01:30	07-May-2025 01:40
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510691-001	WT2510691-002	WT2510691-003	WT2510691-004	WT2510691-005	
					Result	Result	Result	Result	Result	
<b>Volatile Organic Compounds</b>										
Acetone	67-64-1	E611D/WT	20	µg/L	<20	<20	<20	<20	<20	
Benzene	71-43-2	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Bromodichloromethane	75-27-4	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Bromoform	75-25-2	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Bromomethane	74-83-9	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Carbon disulfide	75-15-0	E611D/WT	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Carbon tetrachloride	56-23-5	E611D/WT	0.20	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	
Chlorobenzene	108-90-7	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	1.04 <sup>OWP</sup>	
Chloroethane	75-00-3	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Chloroform	67-66-3	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Chloromethane	74-87-3	E611D/WT	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	
Dibromochloromethane	124-48-1	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Dibromoethane, 1,2-	106-93-4	E611D/WT	0.20	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	
Dichlorobenzene, 1,2-	95-50-1	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Dichlorobenzene, 1,3-	541-73-1	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Dichlorodifluoromethane	75-71-8	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Dichloroethane, 1,1-	75-34-3	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Dichloroethane, 1,2-	107-06-2	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Dichloroethylene, 1,1-	75-35-4	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Dichloroethylene, cis-1,2-	156-59-2	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	



## Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	MW1	MW2S	MW2D	MW3	MW4
					Client sampling date / time	----	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	07-May-2025 01:00	07-May-2025 01:10	07-May-2025 01:20	07-May-2025 01:30	07-May-2025 01:40	
					WT2510691-001	WT2510691-002	WT2510691-003	WT2510691-004	WT2510691-005	
					Result	Result	Result	Result	Result	
<b>Volatile Organic Compounds</b>										
Dichloroethylene, trans-1,2-	156-60-5	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Dichloromethane	75-09-2	E611D/WT	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Dichloropropane, 1,2-	78-87-5	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Dichloropropylene, cis-1,3-	10061-01-5	E611D/WT	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	
Dichloropropylene, trans-1,3-	10061-02-6	E611D/WT	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	
Ethylbenzene	100-41-4	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Hexane, n-	110-54-3	E611D/WT	0.50	µg/L	<0.50	0.67 <sup>OWP</sup>	<0.50	<0.50	0.52 <sup>OWP</sup>	
Hexanone, 2-	591-78-6	E611D/WT	20	µg/L	<20	<20	<20	<20	<20	
Methyl ethyl ketone [MEK]	78-93-3	E611D/WT	20	µg/L	<20	<20	<20	<20	<20	
Methyl isobutyl ketone [MIBK]	108-10-1	E611D/WT	20	µg/L	<20	<20	<20	<20	<20	
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Styrene	100-42-5	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Tetrachloroethylene	127-18-4	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Toluene	108-88-3	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Trichlorobenzene, 1,2,4-	120-82-1	E611E/WT	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Trichloroethane, 1,1,1-	71-55-6	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Trichloroethane, 1,1,2-	79-00-5	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Trichloroethylene	79-01-6	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Trichlorofluoromethane	75-69-4	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	



### Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	MW1 ----	MW2S ----	MW2D ----	MW3 ----	MW4 ----
					Client sampling date / time	07-May-2025 01:00	07-May-2025 01:10	07-May-2025 01:20	07-May-2025 01:30	07-May-2025 01:40
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510691-001	WT2510691-002	WT2510691-003	WT2510691-004	WT2510691-005	
					Result	Result	Result	Result	Result	
<b>Volatile Organic Compounds</b>										
Vinyl chloride	75-01-4	E611D/WT	0.20	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	
Xylene, m+p-	179601-23-1	E611D/WT	0.40	µg/L	<0.40	<0.40	<0.40	<0.40	0.51 <sup>OWP</sup>	
Xylene, o-	95-47-6	E611D/WT	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	
Xylenes, total	1330-20-7	E611D/WT	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	0.51	
<b>Volatile Organic Compounds Surrogates</b>										
Bromofluorobenzene, 4-	460-00-4	E611E/WT	1.0	%	89.1	89.5	89.6	89.3	89.3	
Bromofluorobenzene, 4-	460-00-4	E611D/WT	1.0	%	89.1	89.5	89.6	89.3	89.3	
Difluorobenzene, 1,4-	540-36-3	E611E/WT	1.0	%	97.4	97.0	96.8	96.7	96.8	
Difluorobenzene, 1,4-	540-36-3	E611D/WT	1.0	%	97.4	97.0	96.8	96.7	96.8	

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	MW5S ----	MW5D ----	----	----	----
					Client sampling date / time	07-May-2025 01:50	07-May-2025 02:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510691-006	WT2510691-007	----	----	----	
					Result	Result	----	----	----	
<b>Sample Preparation</b>										
Dissolved carbon filtration location	----	EP358/WT	-	-	field	field	----	----	----	
<b>Physical Tests</b>										
Alkalinity, bicarbonate (as CaCO3)	----	E290/WT	1.0	mg/L	872	277	----	----	----	
Alkalinity, carbonate (as CaCO3)	----	E290/WT	1.0	mg/L	<5.0 <sup>DLM</sup>	3.7	----	----	----	
Alkalinity, hydroxide (as CaCO3)	----	E290/WT	1.0	mg/L	<5.0 <sup>DLM</sup>	<1.0	----	----	----	
Alkalinity, phenolphthalein (as CaCO3)	----	E290/WT	1.0	mg/L	<5.0 <sup>DLM</sup>	1.9	----	----	----	



## Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	MW5S	MW5D	----	----	----
					Client sampling date / time	07-May-2025 01:50	07-May-2025 02:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510691-006	WT2510691-007	----	----	----	
					Result	Result	----	----	----	
<b>Physical Tests</b>										
Alkalinity, total (as CaCO3)	----	E290/WT	1.0	mg/L	872	281	----	----	----	
Hardness (as CaCO3), dissolved	----	EC100/WT	0.50	mg/L	319	235	----	----	----	
pH	----	E108/WT	0.10	pH units	7.84	8.31	----	----	----	
Solids, total dissolved [TDS]	----	E162/WT	10	mg/L	585 <sup>DLDS</sup>	334 <sup>DLDS</sup>	----	----	----	
<b>Anions and Nutrients</b>										
Ammonia, total (as N)	7664-41-7	E298/WT	0.0050	mg/L	<0.0050	0.0255	----	----	----	
Bromide	24959-67-9	E235.Br/WT	0.10	mg/L	<0.10	<0.10	----	----	----	
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L	5.73	12.1	----	----	----	
Fluoride	16984-48-8	E235.F/WT	0.020	mg/L	0.771	1.54	----	----	----	
Nitrite (as N)	14797-65-0	E235.NO2/WT	0.010	mg/L	<0.010	<0.010	----	----	----	
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	0.0010	mg/L	0.0020	0.0014	----	----	----	
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	0.30	mg/L	18.4	14.2	----	----	----	
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L	4.76	<0.020	----	----	----	
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	0.0200	mg/L	4.76	<0.0224	----	----	----	
<b>Organic / Inorganic Carbon</b>										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L	1.65	0.97	----	----	----	
<b>Dissolved Metals</b>										
Aluminum, dissolved	7429-90-5	E421/WT	0.0010	mg/L	0.0018	0.0223	----	----	----	
Arsenic, dissolved	7440-38-2	E421/WT	0.00010	mg/L	0.00040	0.00329	----	----	----	
Barium, dissolved	7440-39-3	E421/WT	0.00010	mg/L	0.116	0.0437	----	----	----	
Boron, dissolved	7440-42-8	E421/WT	0.010	mg/L	<0.010	0.114	----	----	----	



## Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	MW5S	MW5D	----	----	----
					Client sampling date / time	07-May-2025 01:50	07-May-2025 02:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510691-006	WT2510691-007	----	----	----	
					Result	Result	----	----	----	
<b>Dissolved Metals</b>										
Cadmium, dissolved	7440-43-9	E421/WT	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----	
Calcium, dissolved	7440-70-2	E421/WT	0.050	mg/L	86.7	40.6	----	----	----	
Chromium, dissolved	7440-47-3	E421/WT	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Copper, dissolved	7440-50-8	E421/WT	0.00020	mg/L	0.00075	0.00037	----	----	----	
Iron, dissolved	7439-89-6	E421/WT	0.010	mg/L	<0.010	0.016	----	----	----	
Lead, dissolved	7439-92-1	E421/WT	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Magnesium, dissolved	7439-95-4	E421/WT	0.0050	mg/L	25.0	32.4	----	----	----	
Manganese, dissolved	7439-96-5	E421/WT	0.00010	mg/L	0.00011	0.00069	----	----	----	
Potassium, dissolved	7440-09-7	E421/WT	0.050	mg/L	1.29	1.49	----	----	----	
Selenium, dissolved	7782-49-2	E421/WT	0.000050	mg/L	0.00101	<0.000050	----	----	----	
Silicon, dissolved	7440-21-3	E421/WT	0.050	mg/L	6.20	6.45	----	----	----	
Sodium, dissolved	7440-23-5	E421/WT	0.050	mg/L	20.0	25.5	----	----	----	
Zinc, dissolved	7440-66-6	E421/WT	0.0010	mg/L	<0.0010	<0.0010	----	----	----	
Dissolved metals filtration location	----	EP421/WT	-	-	Field	Field	----	----	----	
<b>Volatile Organic Compounds</b>										
Acetone	67-64-1	E611D/WT	20	µg/L	<20	<20	----	----	----	
Benzene	71-43-2	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Bromodichloromethane	75-27-4	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Bromoform	75-25-2	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Bromomethane	74-83-9	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Carbon disulfide	75-15-0	E611D/WT	1.0	µg/L	<1.0	<1.0	----	----	----	



## Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	MW5S	MW5D	----	----	----
					Client sampling date / time	07-May-2025 01:50	07-May-2025 02:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510691-006	WT2510691-007	----	----	----	
					Result	Result	----	----	----	
<b>Volatile Organic Compounds</b>										
Carbon tetrachloride	56-23-5	E611D/WT	0.20	µg/L	<0.20	<0.20	----	----	----	
Chlorobenzene	108-90-7	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Chloroethane	75-00-3	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Chloroform	67-66-3	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Chloromethane	74-87-3	E611D/WT	2.0	µg/L	<2.0	<2.0	----	----	----	
Dibromochloromethane	124-48-1	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Dibromoethane, 1,2-	106-93-4	E611D/WT	0.20	µg/L	<0.20	<0.20	----	----	----	
Dichlorobenzene, 1,2-	95-50-1	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Dichlorobenzene, 1,3-	541-73-1	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Dichlorodifluoromethane	75-71-8	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Dichloroethane, 1,1-	75-34-3	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Dichloroethane, 1,2-	107-06-2	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Dichloroethylene, 1,1-	75-35-4	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Dichloroethylene, cis-1,2-	156-59-2	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Dichloroethylene, trans-1,2-	156-60-5	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Dichloromethane	75-09-2	E611D/WT	1.0	µg/L	<1.0	<1.0	----	----	----	
Dichloropropane, 1,2-	78-87-5	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Dichloropropylene, cis-1,3-	10061-01-5	E611D/WT	0.30	µg/L	<0.30	<0.30	----	----	----	
Dichloropropylene, trans-1,3-	10061-02-6	E611D/WT	0.30	µg/L	<0.30	<0.30	----	----	----	
Ethylbenzene	100-41-4	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	



## Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	MW5S	MW5D	----	----	----
					Client sampling date / time	07-May-2025 01:50	07-May-2025 02:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510691-006	WT2510691-007	----	----	----	
					Result	Result	----	----	----	
<b>Volatile Organic Compounds</b>										
Hexane, n-	110-54-3	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Hexanone, 2-	591-78-6	E611D/WT	20	µg/L	<20	<20	----	----	----	
Methyl ethyl ketone [MEK]	78-93-3	E611D/WT	20	µg/L	<20	<20	----	----	----	
Methyl isobutyl ketone [MIBK]	108-10-1	E611D/WT	20	µg/L	<20	<20	----	----	----	
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Styrene	100-42-5	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Tetrachloroethylene	127-18-4	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Toluene	108-88-3	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Trichlorobenzene, 1,2,4-	120-82-1	E611E/WT	1.0	µg/L	<1.0	<1.0	----	----	----	
Trichloroethane, 1,1,1-	71-55-6	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Trichloroethane, 1,1,2-	79-00-5	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Trichloroethylene	79-01-6	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Trichlorofluoromethane	75-69-4	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
Vinyl chloride	75-01-4	E611D/WT	0.20	µg/L	<0.20	<0.20	----	----	----	
Xylene, m+p-	179601-23-1	E611D/WT	0.40	µg/L	<0.40	<0.40	----	----	----	
Xylene, o-	95-47-6	E611D/WT	0.30	µg/L	<0.30	<0.30	----	----	----	
Xylenes, total	1330-20-7	E611D/WT	0.50	µg/L	<0.50	<0.50	----	----	----	
<b>Volatile Organic Compounds Surrogates</b>										
Bromofluorobenzene, 4-	460-00-4	E611E/WT	1.0	%	89.1	88.5	----	----	----	



### Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID		----	----	----
					MW5S	MW5D	----	----	----
					----	----	----	----	----
					Client sampling date / time		----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510691-006	WT2510691-007	----	----	----
					Result	Result	----	----	----
<b>Volatile Organic Compounds Surrogates</b>									
<b>Bromofluorobenzene, 4-</b>	460-00-4	E611D/WT	1.0	%	89.1	88.5	----	----	----
<b>Difluorobenzene, 1,4-</b>	540-36-3	E611E/WT	1.0	%	97.0	96.5	----	----	----
<b>Difluorobenzene, 1,4-</b>	540-36-3	E611D/WT	1.0	%	97.0	96.5	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.



## QUALITY CONTROL INTERPRETIVE REPORT

<p><b>Work Order</b> : <b>WT2510691</b></p> <p><b>Amendment</b> : <b>2</b></p> <p><b>Client</b> : <b>Pinchin Ltd.</b></p> <p><b>Contact</b> : Deana Bettencourt</p> <p><b>Address</b> : 225 Labrador Drive Unit #1 Waterloo ON Canada N2K 4M8</p> <p><b>Telephone</b> : ----</p> <p><b>Project</b> : WEST PERTH HIBBERT GW</p> <p><b>PO</b> : 333568.002</p> <p><b>C-O-C number</b> : ----</p> <p><b>Sampler</b> : ML/DH</p> <p><b>Site</b> : West Perth</p> <p><b>Quote number</b> : West Perth Landfill</p> <p><b>No. of samples received</b> : 7</p> <p><b>No. of samples analysed</b> : 7</p>	<p><b>Page</b> : 1 of 19</p> <p><b>Laboratory</b> : ALS Environmental - Waterloo</p> <p><b>Account Manager</b> : Amanda Overholster</p> <p><b>Address</b> : 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8</p> <p><b>Telephone</b> : 1 416 817 2944</p> <p><b>Date Samples Received</b> : 07-May-2025 16:30</p> <p><b>Issue Date</b> : 10-Jul-2025 13:50</p>
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This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

**Key**

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

### ***Workorder Comments***

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

### ***Summary of Outliers***

#### ***Outliers : Quality Control Samples***

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

#### ***Outliers: Reference Material (RM) Samples***

- No Reference Material (RM) Sample outliers occur.

### ***Outliers : Analysis Holding Time Compliance (Breaches)***

- No Analysis Holding Time Outliers exist.

### ***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
Amber glass total (sulfuric acid) MW5D	E298	07-May-2025	10-May-2025	28 days	3 days	✔	12-May-2025	28 days	3 days	✔	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
Amber glass total (sulfuric acid) MW5S	E298	07-May-2025	10-May-2025	28 days	3 days	✔	12-May-2025	28 days	3 days	✔	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
Amber glass total (sulfuric acid) MW1	E298	07-May-2025	10-May-2025	28 days	4 days	✔	12-May-2025	28 days	4 days	✔	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
Amber glass total (sulfuric acid) MW2D	E298	07-May-2025	10-May-2025	28 days	4 days	✔	12-May-2025	28 days	4 days	✔	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
Amber glass total (sulfuric acid) MW2S	E298	07-May-2025	10-May-2025	28 days	4 days	✔	12-May-2025	28 days	4 days	✔	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
Amber glass total (sulfuric acid) MW3	E298	07-May-2025	10-May-2025	28 days	4 days	✔	12-May-2025	28 days	4 days	✔	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
Amber glass total (sulfuric acid) MW4	E298	07-May-2025	10-May-2025	28 days	4 days	✔	12-May-2025	28 days	4 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Bromide in Water by IC</b>											
HDPE [ON MECP] MW1	E235.Br	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Bromide in Water by IC</b>											
HDPE [ON MECP] MW2D	E235.Br	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Bromide in Water by IC</b>											
HDPE [ON MECP] MW2S	E235.Br	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Bromide in Water by IC</b>											
HDPE [ON MECP] MW3	E235.Br	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Bromide in Water by IC</b>											
HDPE [ON MECP] MW4	E235.Br	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Bromide in Water by IC</b>											
HDPE [ON MECP] MW5D	E235.Br	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Bromide in Water by IC</b>											
HDPE [ON MECP] MW5S	E235.Br	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE [ON MECP] MW1	E235.Cl	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE [ON MECP] MW2D	E235.Cl	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE [ON MECP] MW2S	E235.Cl	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE [ON MECP] MW3	E235.Cl	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE [ON MECP] MW4	E235.Cl	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE [ON MECP] MW5D	E235.Cl	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE [ON MECP] MW5S	E235.Cl	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)</b>											
HDPE [ON MECP] MW1	E378-U	07-May-2025	09-May-2025	7 days	2 days	✔	10-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)</b>											
HDPE [ON MECP] MW2D	E378-U	07-May-2025	09-May-2025	7 days	2 days	✔	10-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)</b>											
HDPE [ON MECP] MW2S	E378-U	07-May-2025	09-May-2025	7 days	2 days	✔	10-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)</b>											
HDPE [ON MECP] MW3	E378-U	07-May-2025	09-May-2025	7 days	2 days	✔	10-May-2025	7 days	2 days	✔	



Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)</b>										
HDPE [ON MECP] MW4	E378-U	07-May-2025	09-May-2025	7 days	2 days	✓	10-May-2025	7 days	2 days	✓
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)</b>										
HDPE [ON MECP] MW5D	E378-U	07-May-2025	09-May-2025	7 days	2 days	✓	10-May-2025	7 days	2 days	✓
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)</b>										
HDPE [ON MECP] MW5S	E378-U	07-May-2025	09-May-2025	7 days	2 days	✓	10-May-2025	7 days	2 days	✓
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE [ON MECP] MW1	E235.F	07-May-2025	09-May-2025	28 days	2 days	✓	12-May-2025	28 days	2 days	✓
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE [ON MECP] MW2D	E235.F	07-May-2025	09-May-2025	28 days	2 days	✓	12-May-2025	28 days	2 days	✓
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE [ON MECP] MW2S	E235.F	07-May-2025	09-May-2025	28 days	2 days	✓	12-May-2025	28 days	2 days	✓
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE [ON MECP] MW3	E235.F	07-May-2025	09-May-2025	28 days	2 days	✓	12-May-2025	28 days	2 days	✓
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE [ON MECP] MW4	E235.F	07-May-2025	09-May-2025	28 days	2 days	✓	12-May-2025	28 days	2 days	✓
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE [ON MECP] MW5D	E235.F	07-May-2025	09-May-2025	28 days	2 days	✓	12-May-2025	28 days	2 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE [ON MECP] MW5S	E235.F	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE [ON MECP] MW1	E235.NO3	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE [ON MECP] MW2D	E235.NO3	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE [ON MECP] MW2S	E235.NO3	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE [ON MECP] MW3	E235.NO3	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE [ON MECP] MW4	E235.NO3	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE [ON MECP] MW5D	E235.NO3	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE [ON MECP] MW5S	E235.NO3	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE [ON MECP] MW1	E235.NO2	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE [ON MECP] MW2D	E235.NO2	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE [ON MECP] MW2S	E235.NO2	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE [ON MECP] MW3	E235.NO2	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE [ON MECP] MW4	E235.NO2	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE [ON MECP] MW5D	E235.NO2	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE [ON MECP] MW5S	E235.NO2	07-May-2025	09-May-2025	7 days	2 days	✔	12-May-2025	7 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE [ON MECP] MW1	E235.SO4	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE [ON MECP] MW2D	E235.SO4	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE [ON MECP] MW2S	E235.SO4	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE [ON MECP] MW3	E235.SO4	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE [ON MECP] MW4	E235.SO4	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE [ON MECP] MW5D	E235.SO4	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE [ON MECP] MW5S	E235.SO4	07-May-2025	09-May-2025	28 days	2 days	✔	12-May-2025	28 days	2 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE dissolved (nitric acid) MW1	E421	07-May-2025	09-May-2025	180 days	2 days	✔	09-May-2025	180 days	2 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE dissolved (nitric acid) MW2D	E421	07-May-2025	09-May-2025	180 days	2 days	✔	09-May-2025	180 days	2 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE dissolved (nitric acid) MW2S	E421	07-May-2025	09-May-2025	180 days	2 days	✔	09-May-2025	180 days	2 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE dissolved (nitric acid) MW3	E421	07-May-2025	09-May-2025	180 days	2 days	✔	09-May-2025	180 days	2 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE dissolved (nitric acid) MW4	E421	07-May-2025	09-May-2025	180 days	2 days	✔	09-May-2025	180 days	2 days	✔	



Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE dissolved (nitric acid) MW5D	E421	07-May-2025	09-May-2025	180 days	2 days	✓	09-May-2025	180 days	2 days	✓	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE dissolved (nitric acid) MW5S	E421	07-May-2025	09-May-2025	180 days	2 days	✓	09-May-2025	180 days	2 days	✓	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) [ON MECP] MW1	E358-L	07-May-2025	08-May-2025	28 days	2 days	✓	09-May-2025	28 days	2 days	✓	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) [ON MECP] MW2D	E358-L	07-May-2025	08-May-2025	28 days	2 days	✓	09-May-2025	28 days	2 days	✓	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) [ON MECP] MW2S	E358-L	07-May-2025	08-May-2025	28 days	2 days	✓	09-May-2025	28 days	2 days	✓	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) [ON MECP] MW3	E358-L	07-May-2025	08-May-2025	28 days	2 days	✓	09-May-2025	28 days	2 days	✓	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) [ON MECP] MW4	E358-L	07-May-2025	08-May-2025	28 days	2 days	✓	09-May-2025	28 days	2 days	✓	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) [ON MECP] MW5D	E358-L	07-May-2025	08-May-2025	28 days	2 days	✓	09-May-2025	28 days	2 days	✓	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass dissolved (sulfuric acid) [ON MECP] MW5S	E358-L	07-May-2025	08-May-2025	28 days	2 days	✓	09-May-2025	28 days	2 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE [ON MECP] MW1	E290	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔	
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE [ON MECP] MW2D	E290	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔	
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE [ON MECP] MW2S	E290	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔	
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE [ON MECP] MW3	E290	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔	
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE [ON MECP] MW4	E290	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔	
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE [ON MECP] MW5D	E290	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔	
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE [ON MECP] MW5S	E290	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔	
<b>Physical Tests : pH by Meter</b>											
HDPE [ON MECP] MW1	E108	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔	
<b>Physical Tests : pH by Meter</b>											
HDPE [ON MECP] MW2D	E108	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Physical Tests : pH by Meter</b>										
HDPE [ON MECP] MW2S	E108	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔
<b>Physical Tests : pH by Meter</b>										
HDPE [ON MECP] MW3	E108	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔
<b>Physical Tests : pH by Meter</b>										
HDPE [ON MECP] MW4	E108	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔
<b>Physical Tests : pH by Meter</b>										
HDPE [ON MECP] MW5D	E108	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔
<b>Physical Tests : pH by Meter</b>										
HDPE [ON MECP] MW5S	E108	07-May-2025	09-May-2025	14 days	2 days	✔	10-May-2025	14 days	2 days	✔
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE [ON MECP] MW1	E162	07-May-2025	----	----	----		12-May-2025	7 days	6 days	✔
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE [ON MECP] MW2D	E162	07-May-2025	----	----	----		12-May-2025	7 days	6 days	✔
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE [ON MECP] MW2S	E162	07-May-2025	----	----	----		12-May-2025	7 days	6 days	✔
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE [ON MECP] MW3	E162	07-May-2025	----	----	----		12-May-2025	7 days	6 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE [ON MECP] MW4	E162	07-May-2025	----	----	----		12-May-2025	7 days	6 days	✔
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE [ON MECP] MW5D	E162	07-May-2025	----	----	----		13-May-2025	7 days	7 days	✔
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE [ON MECP] MW5S	E162	07-May-2025	----	----	----		13-May-2025	7 days	7 days	✔
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW1	E611D	07-May-2025	09-May-2025	14 days	2 days	✔	09-May-2025	14 days	2 days	✔
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW2D	E611D	07-May-2025	09-May-2025	14 days	2 days	✔	09-May-2025	14 days	2 days	✔
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW2S	E611D	07-May-2025	09-May-2025	14 days	2 days	✔	09-May-2025	14 days	2 days	✔
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW3	E611D	07-May-2025	09-May-2025	14 days	2 days	✔	09-May-2025	14 days	2 days	✔
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW4	E611D	07-May-2025	09-May-2025	14 days	2 days	✔	09-May-2025	14 days	2 days	✔
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW5D	E611D	07-May-2025	09-May-2025	14 days	2 days	✔	09-May-2025	14 days	2 days	✔



Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW5S	E611D	07-May-2025	09-May-2025	14 days	2 days	✓	09-May-2025	14 days	2 days	✓
<b>Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW1	E611E	07-May-2025	09-May-2025	14 days	2 days	✓	09-May-2025	14 days	2 days	✓
<b>Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW2D	E611E	07-May-2025	09-May-2025	14 days	2 days	✓	09-May-2025	14 days	2 days	✓
<b>Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW2S	E611E	07-May-2025	09-May-2025	14 days	2 days	✓	09-May-2025	14 days	2 days	✓
<b>Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW3	E611E	07-May-2025	09-May-2025	14 days	2 days	✓	09-May-2025	14 days	2 days	✓
<b>Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW4	E611E	07-May-2025	09-May-2025	14 days	2 days	✓	09-May-2025	14 days	2 days	✓
<b>Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW5D	E611E	07-May-2025	09-May-2025	14 days	2 days	✓	09-May-2025	14 days	2 days	✓
<b>Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS</b>										
Glass vial (sodium bisulfate) MW5S	E611E	07-May-2025	09-May-2025	14 days	2 days	✓	09-May-2025	14 days	2 days	✓

**Legend & Qualifier Definitions**

Rec. HT: ALS recommended hold time (see units).



## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: \* = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
pH by Meter	E108	1987965	1	18	5.5	5.0	✓
TDS by Gravimetry	E162	1992309	2	39	5.1	5.0	✓
Bromide in Water by IC	E235.Br	1987962	1	12	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	1987961	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	1987960	1	18	5.5	5.0	✓
Nitrite in Water by IC	E235.NO2	1987964	1	13	7.6	5.0	✓
Nitrate in Water by IC	E235.NO3	1987963	1	13	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1987959	1	18	5.5	5.0	✓
Alkalinity Species by Titration	E290	1987966	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	1990073	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1986234	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1987958	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1987353	1	20	5.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1987992	1	20	5.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1987991	1	11	9.0	5.0	✓
<b>Laboratory Control Samples (LCS)</b>							
pH by Meter	E108	1987965	1	18	5.5	5.0	✓
TDS by Gravimetry	E162	1992309	2	39	5.1	5.0	✓
Bromide in Water by IC	E235.Br	1987962	1	12	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	1987961	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	1987960	1	18	5.5	5.0	✓
Nitrite in Water by IC	E235.NO2	1987964	1	13	7.6	5.0	✓
Nitrate in Water by IC	E235.NO3	1987963	1	13	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1987959	1	18	5.5	5.0	✓
Alkalinity Species by Titration	E290	1987966	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	1990073	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1986234	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1987958	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1987353	1	20	5.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1987992	1	20	5.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1987991	1	11	9.0	5.0	✓
<b>Method Blanks (MB)</b>							
TDS by Gravimetry	E162	1992309	2	39	5.1	5.0	✓
Bromide in Water by IC	E235.Br	1987962	1	12	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	1987961	1	14	7.1	5.0	✓



Matrix: **Water**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Fluoride in Water by IC	E235.F	1987960	1	18	5.5	5.0	✔
Nitrite in Water by IC	E235.NO2	1987964	1	13	7.6	5.0	✔
Nitrate in Water by IC	E235.NO3	1987963	1	13	7.6	5.0	✔
Sulfate in Water by IC	E235.SO4	1987959	1	18	5.5	5.0	✔
Alkalinity Species by Titration	E290	1987966	1	13	7.6	5.0	✔
Ammonia by Fluorescence	E298	1990073	1	20	5.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1986234	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1987958	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	1987353	1	20	5.0	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1987992	1	20	5.0	5.0	✔
VOCs (Prairies List) by Headspace GC-MS	E611E	1987991	1	11	9.0	5.0	✔
<b>Matrix Spikes (MS)</b>							
Bromide in Water by IC	E235.Br	1987962	1	12	8.3	5.0	✔
Chloride in Water by IC	E235.Cl	1987961	1	14	7.1	5.0	✔
Fluoride in Water by IC	E235.F	1987960	1	18	5.5	5.0	✔
Nitrite in Water by IC	E235.NO2	1987964	1	13	7.6	5.0	✔
Nitrate in Water by IC	E235.NO3	1987963	1	13	7.6	5.0	✔
Sulfate in Water by IC	E235.SO4	1987959	1	18	5.5	5.0	✔
Ammonia by Fluorescence	E298	1990073	1	20	5.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1986234	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1987958	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	1987353	1	20	5.0	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1987992	1	20	5.0	5.0	✔
VOCs (Prairies List) by Headspace GC-MS	E611E	1987991	1	11	9.0	5.0	✔



## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TDS by Gravimetry	E162 ALS Environmental - Waterloo	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC	E235.Br ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Waterloo	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Waterloo	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.  Field filtration is recommended to ensure test results represent conditions at time of sampling.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Waterloo	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
VOCs (Eastern Canada List) by Headspace GC-MS	E611D ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
VOCs (Prairies List) by Headspace GC-MS	E611E ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Waterloo	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> , dissolved)" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Waterloo	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Waterloo	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dissolved Metals Water Filtration	EP421 ALS Environmental - Waterloo	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Waterloo	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into a GC-MS-FID.

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: WT2510691</b>	<b>Page</b>	: 1 of 14
<b>Amendment</b>	<b>: 2</b>		
<b>Client</b>	: Pinchin Ltd.	<b>Laboratory</b>	: ALS Environmental - Waterloo
<b>Contact</b>	: Deana Bettencourt	<b>Account Manager</b>	: Amanda Overholster
<b>Address</b>	: 225 Labrador Drive Unit #1 Waterloo ON Canada N2K 4M8	<b>Address</b>	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
<b>Telephone</b>	: ----	<b>Telephone</b>	: 1 416 817 2944
<b>Project</b>	: WEST PERTH HIBBERT GW	<b>Date Samples Received</b>	: 07-May-2025 16:30
<b>PO</b>	: 333568.002	<b>Date Analysis Commenced</b>	: 08-May-2025
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 10-Jul-2025 13:50
<b>Sampler</b>	: ML/DH		
<b>Site</b>	: West Perth		
<b>Quote number</b>	: West Perth Landfill		
<b>No. of samples received</b>	: 7		
<b>No. of samples analysed</b>	: 7		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
David Tremblett	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Centralized Prep, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario

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Work Order : WT2510691 Amendment 2  
Client : Pinchin Ltd.  
Project : WEST PERTH HIBBERT GW



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## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

# = Indicates a QC result that did not meet the ALS DQO.

## Workorder Comments

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Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

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### Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: <b>Water</b>					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Physical Tests (QC Lot: 1987965)</b>											
WT2510738-001	Anonymous	pH	----	E108	0.10	pH units	8.41	8.43	0.238%	4%	----
<b>Physical Tests (QC Lot: 1987966)</b>											
WT2510738-001	Anonymous	Alkalinity, total (as CaCO <sub>3</sub> )	----	E290	1.0	mg/L	194	194	0.0103%	20%	----
<b>Physical Tests (QC Lot: 1992309)</b>											
WT2510669-001	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	1620	1600	1.12%	20%	----
<b>Physical Tests (QC Lot: 1994127)</b>											
WT2510672-001	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	526	500	4.97%	20%	----
<b>Anions and Nutrients (QC Lot: 1987958)</b>											
WT2510691-002	MW2S	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0017	0.0017	0.00004	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1987959)</b>											
WT2510691-001	MW1	Sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	1.50	mg/L	<1.50	<1.50	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1987960)</b>											
WT2510691-001	MW1	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.332	0.332	0.0006	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1987961)</b>											
WT2510691-001	MW1	Chloride	16887-00-6	E235.Cl	2.50	mg/L	43.9	43.7	0.541%	20%	----
<b>Anions and Nutrients (QC Lot: 1987962)</b>											
WT2510691-001	MW1	Bromide	24959-67-9	E235.Br	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1987963)</b>											
WT2510691-001	MW1	Nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1987964)</b>											
WT2510691-001	MW1	Nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1990073)</b>											
HA2501273-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0495	0.0493	0.0002	Diff <2x LOR	----
<b>Organic / Inorganic Carbon (QC Lot: 1986234)</b>											
WT2510561-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	18.4	18.4	0.0814%	20%	----
<b>Dissolved Metals (QC Lot: 1987353)</b>											
WT2510589-002	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00100	mg/L	<1.00 µg/L	<0.00100	0	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00100	mg/L	74.2 µg/L	0.0750	1.04%	20%	----
		Boron, dissolved	7440-42-8	E421	0.100	mg/L	146 µg/L	0.147	0.001	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Dissolved Metals (QC Lot: 1987353) - continued</b>											
WT2510589-002	Anonymous	Cadmium, dissolved	7440-43-9	E421	0.0000500	mg/L	0.0980 µg/L	0.000104	0.0000060	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.500	mg/L	218	219	0.590%	20%	----
		Chromium, dissolved	7440-47-3	E421	0.00500	mg/L	<5.00 µg/L	<0.00500	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00200	mg/L	2.50 µg/L	0.00239	0.00012	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.100	mg/L	1.63	1.66	1.32%	20%	----
		Lead, dissolved	7439-92-1	E421	0.000500	mg/L	<0.500 µg/L	<0.000500	0	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	30.1	30.1	0.124%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00100	mg/L	4.05	4.09	0.794%	20%	----
		Potassium, dissolved	7440-09-7	E421	0.500	mg/L	1.93	1.97	0.041	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000500	mg/L	<0.500 µg/L	<0.000500	0	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.500	mg/L	4.47	4.45	0.017	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.500	mg/L	46200 µg/L	46.4	0.443%	20%	----
		Zinc, dissolved	7440-66-6	E421	0.0100	mg/L	11.7 µg/L	0.0112	0.0005	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 1987991)</b>											
WT2510508-001	Anonymous	Trichlorobenzene, 1,2,4-	120-82-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 1987992)</b>											
WT2510508-001	Anonymous	Acetone	67-64-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Benzene	71-43-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Carbon disulfide	75-15-0	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E611D	2.0	µg/L	<2.0	<2.0	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Volatile Organic Compounds (QC Lot: 1987992) - continued</b>											
WT2510508-001	Anonymous	Dichloroethane, 1,2-	107-06-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Hexane, n-	110-54-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Hexanone, 2-	591-78-6	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Styrene	100-42-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611D	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----



## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Physical Tests (QCLot: 1987966)</b>						
Alkalinity, bicarbonate (as CaCO3)	---	E290	1	mg/L	<1.0	---
Alkalinity, carbonate (as CaCO3)	---	E290	1	mg/L	<1.0	---
Alkalinity, hydroxide (as CaCO3)	---	E290	1	mg/L	<1.0	---
Alkalinity, phenolphthalein (as CaCO3)	---	E290	1	mg/L	<1.0	---
Alkalinity, total (as CaCO3)	---	E290	1	mg/L	<1.0	---
<b>Physical Tests (QCLot: 1992309)</b>						
Solids, total dissolved [TDS]	---	E162	10	mg/L	<10	---
<b>Physical Tests (QCLot: 1994127)</b>						
Solids, total dissolved [TDS]	---	E162	10	mg/L	<10	---
<b>Anions and Nutrients (QCLot: 1987958)</b>						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	---
<b>Anions and Nutrients (QCLot: 1987959)</b>						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
<b>Anions and Nutrients (QCLot: 1987960)</b>						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 1987961)</b>						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
<b>Anions and Nutrients (QCLot: 1987962)</b>						
Bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	---
<b>Anions and Nutrients (QCLot: 1987963)</b>						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 1987964)</b>						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	---
<b>Anions and Nutrients (QCLot: 1990073)</b>						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
<b>Organic / Inorganic Carbon (QCLot: 1986234)</b>						
Carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
<b>Dissolved Metals (QCLot: 1987353)</b>						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Dissolved Metals (QCLot: 1987353) - continued</b>						
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
<b>Volatile Organic Compounds (QCLot: 1987991)</b>						
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	<1.0	----
<b>Volatile Organic Compounds (QCLot: 1987992)</b>						
Acetone	67-64-1	E611D	20	µg/L	<20	----
Benzene	71-43-2	E611D	0.5	µg/L	<0.50	----
Bromodichloromethane	75-27-4	E611D	0.5	µg/L	<0.50	----
Bromoform	75-25-2	E611D	0.5	µg/L	<0.50	----
Bromomethane	74-83-9	E611D	0.5	µg/L	<0.50	----
Carbon disulfide	75-15-0	E611D	1	µg/L	<1.0	----
Carbon tetrachloride	56-23-5	E611D	0.2	µg/L	<0.20	----
Chlorobenzene	108-90-7	E611D	0.5	µg/L	<0.50	----
Chloroethane	75-00-3	E611D	0.5	µg/L	<0.50	----
Chloroform	67-66-3	E611D	0.5	µg/L	<0.50	----
Chloromethane	74-87-3	E611D	2	µg/L	<2.0	----
Dibromochloromethane	124-48-1	E611D	0.5	µg/L	<0.50	----
Dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	<0.20	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	<0.50	----
Dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	<0.50	----
Dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	<0.50	----
Dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	<0.50	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 1987992) - continued</b>						
Dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	<0.50	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	<0.50	----
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	<0.50	----
Dichloromethane	75-09-2	E611D	1	µg/L	<1.0	----
Dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	<0.50	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	<0.30	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	<0.30	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	<0.50	----
Hexane, n-	110-54-3	E611D	0.5	µg/L	<0.50	----
Hexanone, 2-	591-78-6	E611D	20	µg/L	<20	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	<0.50	----
Styrene	100-42-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611D	0.5	µg/L	<0.50	----
Trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	<0.50	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	<0.50	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	<0.50	----
Trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	<0.50	----
Vinyl chloride	75-01-4	E611D	0.2	µg/L	<0.20	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	<0.30	----



## Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
<b>Physical Tests (QCLot: 1987965)</b>									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
<b>Physical Tests (QCLot: 1987966)</b>									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	103	85.0	115	----
<b>Physical Tests (QCLot: 1992309)</b>									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	96.2	85.0	115	----
<b>Physical Tests (QCLot: 1994127)</b>									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
<b>Anions and Nutrients (QCLot: 1987958)</b>									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.05 mg/L	104	80.0	120	----
<b>Anions and Nutrients (QCLot: 1987959)</b>									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
<b>Anions and Nutrients (QCLot: 1987960)</b>									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
<b>Anions and Nutrients (QCLot: 1987961)</b>									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
<b>Anions and Nutrients (QCLot: 1987962)</b>									
Bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	103	85.0	115	----
<b>Anions and Nutrients (QCLot: 1987963)</b>									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	100	90.0	110	----
<b>Anions and Nutrients (QCLot: 1987964)</b>									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	102	90.0	110	----
<b>Anions and Nutrients (QCLot: 1990073)</b>									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	98.0	85.0	115	----
<b>Organic / Inorganic Carbon (QCLot: 1986234)</b>									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	96.6	80.0	120	----
<b>Dissolved Metals (QCLot: 1987353)</b>									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	0.1 mg/L	105	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	0.05 mg/L	104	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.012 mg/L	96.7	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 1987353) - continued</b>									
Boron, dissolved	7440-42-8	E421	0.01	mg/L	0.05 mg/L	102	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.005 mg/L	94.6	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	2.5 mg/L	93.9	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.012 mg/L	99.9	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.012 mg/L	94.6	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	0.05 mg/L	101	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.025 mg/L	103	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	2.5 mg/L	112	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.012 mg/L	101	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	2.5 mg/L	104	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	0.05 mg/L	98.9	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	0.5 mg/L	105	60.0	140	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	2.5 mg/L	107	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.025 mg/L	98.9	80.0	120	----
<b>Volatile Organic Compounds (QCLot: 1987991)</b>									
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	100 µg/L	99.7	70.0	130	----
<b>Volatile Organic Compounds (QCLot: 1987992)</b>									
Acetone	67-64-1	E611D	20	µg/L	100 µg/L	114	70.0	130	----
Benzene	71-43-2	E611D	0.5	µg/L	100 µg/L	110	70.0	130	----
Bromodichloromethane	75-27-4	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Bromoform	75-25-2	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Bromomethane	74-83-9	E611D	0.5	µg/L	100 µg/L	90.7	60.0	140	----
Carbon disulfide	75-15-0	E611D	1	µg/L	100 µg/L	109	70.0	130	----
Carbon tetrachloride	56-23-5	E611D	0.2	µg/L	100 µg/L	109	70.0	130	----
Chlorobenzene	108-90-7	E611D	0.5	µg/L	100 µg/L	104	70.0	130	----
Chloroethane	75-00-3	E611D	0.5	µg/L	100 µg/L	113	60.0	140	----
Chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	107	70.0	130	----
Chloromethane	74-87-3	E611D	2	µg/L	100 µg/L	122	60.0	140	----
Dibromochloromethane	124-48-1	E611D	0.5	µg/L	100 µg/L	101	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	100 µg/L	96.2	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	108	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	100 µg/L	111	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	112	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	100 µg/L	124	60.0	140	----
Dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
<b>Volatile Organic Compounds (QCLot: 1987992) - continued</b>									
Dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	100 µg/L	101	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	100 µg/L	114	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	100 µg/L	107	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	100 µg/L	111	70.0	130	----
Dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	104	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	100 µg/L	101	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	100 µg/L	96.7	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	100 µg/L	94.4	70.0	130	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	100 µg/L	107	70.0	130	----
Hexane, n-	110-54-3	E611D	0.5	µg/L	100 µg/L	122	70.0	130	----
Hexanone, 2-	591-78-6	E611D	20	µg/L	100 µg/L	71.1	70.0	130	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	100 µg/L	101	70.0	130	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	100 µg/L	77.4	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	100 µg/L	105	70.0	130	----
Styrene	100-42-5	E611D	0.5	µg/L	100 µg/L	99.2	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	100 µg/L	97.7	70.0	130	----
Tetrachloroethane, 1,1,1,2,2-	79-34-5	E611D	0.5	µg/L	100 µg/L	105	70.0	130	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	110	70.0	130	----
Toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	100 µg/L	99.6	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	100 µg/L	97.5	70.0	130	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	110	70.0	130	----
Trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	100 µg/L	112	60.0	140	----
Vinyl chloride	75-01-4	E611D	0.2	µg/L	100 µg/L	120	60.0	140	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	200 µg/L	103	70.0	130	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	100 µg/L	106	70.0	130	----



### Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Anions and Nutrients (QCLot: 1987958)</b>										
WT2510691-002	MW2S	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0189 mg/L	0.02 mg/L	96.3	70.0	130	----
<b>Anions and Nutrients (QCLot: 1987959)</b>										
WT2510691-001	MW1	Sulfate (as SO4)	14808-79-8	E235.SO4	500 mg/L	500 mg/L	100	75.0	125	----
<b>Anions and Nutrients (QCLot: 1987960)</b>										
WT2510691-001	MW1	Fluoride	16984-48-8	E235.F	5.23 mg/L	5 mg/L	105	75.0	125	----
<b>Anions and Nutrients (QCLot: 1987961)</b>										
WT2510691-001	MW1	Chloride	16887-00-6	E235.Cl	499 mg/L	500 mg/L	99.8	75.0	125	----
<b>Anions and Nutrients (QCLot: 1987962)</b>										
WT2510691-001	MW1	Bromide	24959-67-9	E235.Br	2.39 mg/L	2.5 mg/L	95.5	75.0	125	----
<b>Anions and Nutrients (QCLot: 1987963)</b>										
WT2510691-001	MW1	Nitrate (as N)	14797-55-8	E235.NO3	12.4 mg/L	12.5 mg/L	99.0	75.0	125	----
<b>Anions and Nutrients (QCLot: 1987964)</b>										
WT2510691-001	MW1	Nitrite (as N)	14797-65-0	E235.NO2	2.53 mg/L	2.5 mg/L	101	75.0	125	----
<b>Anions and Nutrients (QCLot: 1990073)</b>										
HA2501273-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.103 mg/L	0.1 mg/L	103	75.0	125	----
<b>Organic / Inorganic Carbon (QCLot: 1986234)</b>										
WT2510561-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	----	ND	70.0	130	----
<b>Dissolved Metals (QCLot: 1987353)</b>										
WT2510589-003	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0556 mg/L	0.05 mg/L	111	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	----	ND	70.0	130	----
		Boron, dissolved	7440-42-8	E421	ND mg/L	----	ND	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00461 mg/L	0.005 mg/L	92.2	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	----	ND	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0123 mg/L	0.012 mg/L	98.2	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0108 mg/L	0.012 mg/L	86.4	70.0	130	----
		Iron, dissolved	7439-89-6	E421	0.048 mg/L	0.05 mg/L	95.9	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0240 mg/L	0.025 mg/L	96.2	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	----	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0114 mg/L	0.012 mg/L	91.3	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	ND mg/L	----	ND	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0574 mg/L	0.05 mg/L	115	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	ND mg/L	----	ND	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	----	ND	70.0	130	----



Sub-Matrix: Water

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 1987353) - continued</b>										
WT2510589-003	Anonymous	Zinc, dissolved	7440-66-6	E421	0.0235 mg/L	0.025 mg/L	94.1	70.0	130	---
<b>Volatile Organic Compounds (QCLot: 1987991)</b>										
WT2510508-001	Anonymous	Trichlorobenzene, 1,2,4-	120-82-1	E611E	98.4 µg/L	100 µg/L	98.4	60.0	140	---
<b>Volatile Organic Compounds (QCLot: 1987992)</b>										
WT2510508-001	Anonymous	Acetone	67-64-1	E611D	101 µg/L	100 µg/L	101	60.0	140	---
		Benzene	71-43-2	E611D	101 µg/L	100 µg/L	101	60.0	140	---
		Bromodichloromethane	75-27-4	E611D	97.6 µg/L	100 µg/L	97.6	60.0	140	---
		Bromoform	75-25-2	E611D	95.4 µg/L	100 µg/L	95.4	60.0	140	---
		Bromomethane	74-83-9	E611D	79.1 µg/L	100 µg/L	79.1	60.0	140	---
		Carbon disulfide	75-15-0	E611D	95.1 µg/L	100 µg/L	95.1	60.0	140	---
		Carbon tetrachloride	56-23-5	E611D	98.4 µg/L	100 µg/L	98.4	60.0	140	---
		Chlorobenzene	108-90-7	E611D	96.1 µg/L	100 µg/L	96.1	60.0	140	---
		Chloroethane	75-00-3	E611D	100 µg/L	100 µg/L	100	60.0	140	---
		Chloroform	67-66-3	E611D	98.8 µg/L	100 µg/L	98.8	60.0	140	---
		Chloromethane	74-87-3	E611D	103 µg/L	100 µg/L	103	60.0	140	---
		Dibromochloromethane	124-48-1	E611D	91.4 µg/L	100 µg/L	91.4	60.0	140	---
		Dibromoethane, 1,2-	106-93-4	E611D	85.0 µg/L	100 µg/L	85.0	60.0	140	---
		Dichlorobenzene, 1,2-	95-50-1	E611D	99.5 µg/L	100 µg/L	99.5	60.0	140	---
		Dichlorobenzene, 1,3-	541-73-1	E611D	101 µg/L	100 µg/L	101	60.0	140	---
		Dichlorobenzene, 1,4-	106-46-7	E611D	102 µg/L	100 µg/L	102	60.0	140	---
		Dichlorodifluoromethane	75-71-8	E611D	99.3 µg/L	100 µg/L	99.3	60.0	140	---
		Dichloroethane, 1,1-	75-34-3	E611D	96.8 µg/L	100 µg/L	96.8	60.0	140	---
		Dichloroethane, 1,2-	107-06-2	E611D	89.1 µg/L	100 µg/L	89.1	60.0	140	---
		Dichloroethylene, 1,1-	75-35-4	E611D	102 µg/L	100 µg/L	102	60.0	140	---
		Dichloroethylene, cis-1,2-	156-59-2	E611D	96.7 µg/L	100 µg/L	96.7	60.0	140	---
		Dichloroethylene, trans-1,2-	156-60-5	E611D	101 µg/L	100 µg/L	101	60.0	140	---
		Dichloromethane	75-09-2	E611D	92.8 µg/L	100 µg/L	92.8	60.0	140	---
		Dichloropropane, 1,2-	78-87-5	E611D	91.8 µg/L	100 µg/L	91.8	60.0	140	---
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	89.6 µg/L	100 µg/L	89.6	60.0	140	---
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	82.3 µg/L	100 µg/L	82.3	60.0	140	---
		Ethylbenzene	100-41-4	E611D	98.7 µg/L	100 µg/L	98.7	60.0	140	---
		Hexane, n-	110-54-3	E611D	106 µg/L	100 µg/L	106	60.0	140	---
		Hexanone, 2-	591-78-6	E611D	62 µg/L	100 µg/L	61.8	60.0	140	---
		Methyl ethyl ketone [MEK]	78-93-3	E611D	92 µg/L	100 µg/L	92.2	60.0	140	---
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	72 µg/L	100 µg/L	72.3	60.0	140	---
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	95.6 µg/L	100 µg/L	95.6	60.0	140	---
		Styrene	100-42-5	E611D	91.1 µg/L	100 µg/L	91.1	60.0	140	---
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	90.0 µg/L	100 µg/L	90.0	60.0	140	---
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	96.3 µg/L	100 µg/L	96.3	60.0	140	---
		Tetrachloroethylene	127-18-4	E611D	97.3 µg/L	100 µg/L	97.3	60.0	140	---
		Toluene	108-88-3	E611D	92.7 µg/L	100 µg/L	92.7	60.0	140	---
		Trichloroethane, 1,1,1-	71-55-6	E611D	91.3 µg/L	100 µg/L	91.3	60.0	140	---
		Trichloroethane, 1,1,2-	79-00-5	E611D	84.6 µg/L	100 µg/L	84.6	60.0	140	---

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 Work Order : WT2510691 Amendment 2  
 Client : Pinchin Ltd.  
 Project : WEST PERTH HIBBERT GW



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
<b>Volatile Organic Compounds (QCLot: 1987992) - continued</b>										
WT2510508-001	Anonymous	Trichloroethylene	79-01-6	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Trichlorofluoromethane	75-69-4	E611D	100 µg/L	100 µg/L	100	60.0	140	----
		Vinyl chloride	75-01-4	E611D	103 µg/L	100 µg/L	103	60.0	140	----
		Xylene, m+p-	179601-23-1	E611D	192 µg/L	200 µg/L	96.2	60.0	140	----
		Xylene, o-	95-47-6	E611D	99.0 µg/L	100 µg/L	99.0	60.0	140	----





**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	: <b>WT2510508</b>	<b>Laboratory</b>	: ALS Environmental - Waterloo
<b>Client</b>	: <b>Pinchin Ltd.</b>	<b>Account Manager</b>	: Amanda Overholster
<b>Contact</b>	: Deana Bettencourt	<b>Address</b>	: 60 Northland Road, Unit 1
<b>Address</b>	: 225 Labrador Drive Unit #1 Waterloo Ontario Canada N2K 4M8		: Waterloo ON Canada N2V 2B8
<b>Telephone</b>	: ----	<b>E-mail</b>	: Amanda.Overholster@ALSGlobal.com
<b>Project</b>	: WEST PERTH HIBBERT RESIDENTIAL	<b>Telephone</b>	: 1 416 817 2944
<b>PO</b>	: 33568.002	<b>Date Samples Received</b>	: 06-May-2025 20:00
<b>C-O-C number</b>	: ----	<b>Date Analysis Commenced</b>	: 07-May-2025
<b>Sampler</b>	: CLIENT	<b>Issue Date</b>	: 13-May-2025 16:02
<b>Site</b>	: West Perth		
<b>Quote number</b>	: West Perth Landfill		
<b>No. of samples received</b>	: 1		
<b>No. of samples analysed</b>	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

**Signatories**

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Fleming	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
David Tremblett	VOC Section Supervisor	VOC, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Metals, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Centralized Prep, Waterloo, Ontario



## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key: CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.  
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	no units
mg/L	milligrams per litre
pH units	pH units
µg/L	micrograms per litre

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

## Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Dorssers	----	----	----	----
					Client sampling date / time	06-May-2025 02:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510508-001	----	----	----	----	----
					Result	----	----	----	----	----
<b>Sample Preparation</b>										
Dissolved carbon filtration location	----	EP358/WT	-	-	lab	----	----	----	----	----
<b>Physical Tests</b>										
Alkalinity, bicarbonate (as CaCO3)	----	E290/WT	1.0	mg/L	291	----	----	----	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/WT	1.0	mg/L	<1.0	----	----	----	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/WT	1.0	mg/L	<1.0	----	----	----	----	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290/WT	1.0	mg/L	<1.0	----	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/WT	1.0	mg/L	291	----	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/WT	0.50	mg/L	464	----	----	----	----	----
pH	----	E108/WT	0.10	pH units	7.86	----	----	----	----	----
Solids, total dissolved [TDS]	----	E162/WT	10	mg/L	593 <sup>DLDS</sup>	----	----	----	----	----
<b>Anions and Nutrients</b>										
Ammonia, total (as N)	7664-41-7	E298/WT	0.0050	mg/L	<0.0050	----	----	----	----	----
Bromide	24959-67-9	E235.Br/WT	0.10	mg/L	<0.20 <sup>DLDS</sup>	----	----	----	----	----
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L	14.4 <sup>DLDS</sup>	----	----	----	----	----
Fluoride	16984-48-8	E235.F/WT	0.020	mg/L	1.90 <sup>DLDS</sup>	----	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2/WT	0.010	mg/L	<0.020 <sup>DLDS</sup>	----	----	----	----	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	0.0010	mg/L	<0.0010	----	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	0.30	mg/L	174 <sup>DLDS</sup>	----	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L	0.079 <sup>DLDS</sup>	----	----	----	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	0.0200	mg/L	0.0790	----	----	----	----	----



### Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	Dorsssers	----	----	----	----
					Client sampling date / time	06-May-2025 02:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510508-001	----	----	----	----	----
						Result	----	----	----	----
<b>Organic / Inorganic Carbon</b>										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L	0.53	----	----	----	----	----
<b>Total Metals</b>										
Aluminum, total	7429-90-5	E420/WT	0.0030	mg/L	<0.0030	----	----	----	----	----
Arsenic, total	7440-38-2	E420/WT	0.00010	mg/L	0.00018	----	----	----	----	----
Barium, total	7440-39-3	E420/WT	0.00010	mg/L	0.0528	----	----	----	----	----
Boron, total	7440-42-8	E420/WT	0.010	mg/L	0.085	----	----	----	----	----
Cadmium, total	7440-43-9	E420/WT	0.0000050	mg/L	0.0000283	----	----	----	----	----
Calcium, total	7440-70-2	E420/WT	0.050	mg/L	114	----	----	----	----	----
Chromium, total	7440-47-3	E420/WT	0.00050	mg/L	<0.00050	----	----	----	----	----
Copper, total	7440-50-8	E420/WT	0.00050	mg/L	0.0189	----	----	----	----	----
Iron, total	7439-89-6	E420/WT	0.010	mg/L	<0.010	----	----	----	----	----
Lead, total	7439-92-1	E420/WT	0.000050	mg/L	0.000390	----	----	----	----	----
Magnesium, total	7439-95-4	E420/WT	0.0050	mg/L	43.6	----	----	----	----	----
Manganese, total	7439-96-5	E420/WT	0.00010	mg/L	0.00071	----	----	----	----	----
Potassium, total	7440-09-7	E420/WT	0.050	mg/L	1.00	----	----	----	----	----
Selenium, total	7782-49-2	E420/WT	0.000050	mg/L	0.000537	----	----	----	----	----
Silicon, total	7440-21-3	E420/WT	0.10	mg/L	5.18	----	----	----	----	----
Sodium, total	7440-23-5	E420/WT	0.050	mg/L	25.5	----	----	----	----	----
Zinc, total	7440-66-6	E420/WT	0.0030	mg/L	0.0650	----	----	----	----	----
<b>Volatile Organic Compounds</b>										
Acetone	67-64-1	E611D/WT	20	µg/L	<20	----	----	----	----	----



## Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	Dorssers	----	----	----	----
					Client sampling date / time	06-May-2025 02:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510508-001	----	----	----	----	----
						Result	----	----	----	----
<b>Volatile Organic Compounds</b>										
Benzene	71-43-2	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Bromodichloromethane	75-27-4	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Bromoform	75-25-2	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Bromomethane	74-83-9	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Carbon disulfide	75-15-0	E611D/WT	1.0	µg/L	<1.0	----	----	----	----	----
Carbon tetrachloride	56-23-5	E611D/WT	0.20	µg/L	<0.20	----	----	----	----	----
Chlorobenzene	108-90-7	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Chloroethane	75-00-3	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Chloroform	67-66-3	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Chloromethane	74-87-3	E611D/WT	2.0	µg/L	<2.0	----	----	----	----	----
Dibromochloromethane	124-48-1	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Dibromoethane, 1,2-	106-93-4	E611D/WT	0.20	µg/L	<0.20	----	----	----	----	----
Dichlorobenzene, 1,2-	95-50-1	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Dichlorobenzene, 1,3-	541-73-1	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Dichlorodifluoromethane	75-71-8	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Dichloroethane, 1,1-	75-34-3	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Dichloroethane, 1,2-	107-06-2	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Dichloroethylene, 1,1-	75-35-4	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Dichloroethylene, cis-1,2-	156-59-2	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
Dichloroethylene, trans-1,2-	156-60-5	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----



### Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	Dorssers	---	---	---	---
					Client sampling date / time	06-May-2025 02:00	---	---	---	---
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510508-001	---	---	---	---	---
						Result	---	---	---	---
<b>Volatile Organic Compounds</b>										
Dichloromethane	75-09-2	E611D/WT	1.0	µg/L	<1.0	---	---	---	---	---
Dichloropropane, 1,2-	78-87-5	E611D/WT	0.50	µg/L	<0.50	---	---	---	---	---
Dichloropropylene, cis-1,3-	10061-01-5	E611D/WT	0.30	µg/L	<0.30	---	---	---	---	---
Dichloropropylene, trans-1,3-	10061-02-6	E611D/WT	0.30	µg/L	<0.30	---	---	---	---	---
Ethylbenzene	100-41-4	E611D/WT	0.50	µg/L	<0.50	---	---	---	---	---
Hexane, n-	110-54-3	E611D/WT	0.50	µg/L	<0.50	---	---	---	---	---
Hexanone, 2-	591-78-6	E611D/WT	20	µg/L	<20	---	---	---	---	---
Methyl ethyl ketone [MEK]	78-93-3	E611D/WT	20	µg/L	<20	---	---	---	---	---
Methyl isobutyl ketone [MIBK]	108-10-1	E611D/WT	20	µg/L	<20	---	---	---	---	---
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D/WT	0.50	µg/L	<0.50	---	---	---	---	---
Styrene	100-42-5	E611D/WT	0.50	µg/L	<0.50	---	---	---	---	---
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D/WT	0.50	µg/L	<0.50	---	---	---	---	---
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D/WT	0.50	µg/L	<0.50	---	---	---	---	---
Tetrachloroethylene	127-18-4	E611D/WT	0.50	µg/L	<0.50	---	---	---	---	---
Toluene	108-88-3	E611D/WT	0.50	µg/L	<0.50	---	---	---	---	---
Trichlorobenzene, 1,2,4-	120-82-1	E611E/WT	1.0	µg/L	<1.0	---	---	---	---	---
Trichloroethane, 1,1,1-	71-55-6	E611D/WT	0.50	µg/L	<0.50	---	---	---	---	---
Trichloroethane, 1,1,2-	79-00-5	E611D/WT	0.50	µg/L	<0.50	---	---	---	---	---
Trichloroethylene	79-01-6	E611D/WT	0.50	µg/L	<0.50	---	---	---	---	---
Trichlorofluoromethane	75-69-4	E611D/WT	0.50	µg/L	<0.50	---	---	---	---	---
Vinyl chloride	75-01-4	E611D/WT	0.20	µg/L	<0.20	---	---	---	---	---



### Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	Dorssters	----	----	----	----
					Client sampling date / time	06-May-2025 02:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510508-001	----	----	----	----	----
						Result	----	----	----	----
<b>Volatile Organic Compounds</b>										
Xylene, m+p-	179601-23-1	E611D/WT	0.40	µg/L	<0.40	----	----	----	----	----
Xylene, o-	95-47-6	E611D/WT	0.30	µg/L	<0.30	----	----	----	----	----
Xylenes, total	1330-20-7	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
<b>Volatile Organic Compounds Surrogates</b>										
Bromofluorobenzene, 4-	460-00-4	E611E/WT	1.0	%	88.2	----	----	----	----	----
Bromofluorobenzene, 4-	460-00-4	E611D/WT	1.0	%	88.2	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611E/WT	1.0	%	96.1	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611D/WT	1.0	%	96.1	----	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.




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## QUALITY CONTROL INTERPRETIVE REPORT

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<p><b>Work Order</b> : <b>WT2510508</b></p> <p><b>Client</b> : <b>Pinchin Ltd.</b></p> <p><b>Contact</b> : Deana Bettencourt</p> <p><b>Address</b> : 225 Labrador Drive Unit #1 Waterloo ON Canada N2K 4M8</p> <p><b>Telephone</b> : ----</p> <p><b>Project</b> : WEST PERTH HIBBERT RESIDENTIAL</p> <p><b>PO</b> : 33568.002</p> <p><b>C-O-C number</b> : ----</p> <p><b>Sampler</b> : CLIENT</p> <p><b>Site</b> : West Perth</p> <p><b>Quote number</b> : West Perth Landfill</p> <p><b>No. of samples received</b> : 1</p> <p><b>No. of samples analysed</b> : 1</p>	<p><b>Page</b> : 1 of 9</p> <p><b>Laboratory</b> : ALS Environmental - Waterloo</p> <p><b>Account Manager</b> : Amanda Overholster</p> <p><b>Address</b> : 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8</p> <p><b>Telephone</b> : 1 416 817 2944</p> <p><b>Date Samples Received</b> : 06-May-2025 20:00</p> <p><b>Issue Date</b> : 13-May-2025 16:01</p>
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This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

**Key**

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
  - CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
  - DQO: Data Quality Objective.
  - LOR: Limit of Reporting (detection limit).
  - RPD: Relative Percent Difference.
- 

### ***Workorder Comments***

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Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

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### ***Summary of Outliers***

#### ***Outliers : Quality Control Samples***

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

#### ***Outliers: Reference Material (RM) Samples***

- No Reference Material (RM) Sample outliers occur.

***Outliers : Analysis Holding Time Compliance (Breaches)***

- No Analysis Holding Time Outliers exist.

***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
<b>Amber glass total (sulfuric acid) [ON MECP]</b> Dorssers	E298	06-May-2025	08-May-2025	28 days	3 days	✔	09-May-2025	28 days	3 days	✔	
<b>Anions and Nutrients : Bromide in Water by IC</b>											
<b>HDPE [ON MECP]</b> Dorssers	E235.Br	06-May-2025	08-May-2025	28 days	3 days	✔	09-May-2025	28 days	3 days	✔	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
<b>HDPE [ON MECP]</b> Dorssers	E235.Cl	06-May-2025	08-May-2025	28 days	3 days	✔	09-May-2025	28 days	3 days	✔	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)</b>											
<b>HDPE [ON MECP]</b> Dorssers	E378-U	06-May-2025	08-May-2025	7 days	3 days	✔	10-May-2025	7 days	3 days	✔	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
<b>HDPE [ON MECP]</b> Dorssers	E235.F	06-May-2025	08-May-2025	28 days	3 days	✔	09-May-2025	28 days	3 days	✔	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
<b>HDPE [ON MECP]</b> Dorssers	E235.NO3	06-May-2025	08-May-2025	7 days	3 days	✔	09-May-2025	7 days	3 days	✔	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
<b>HDPE [ON MECP]</b> Dorssers	E235.NO2	06-May-2025	08-May-2025	7 days	3 days	✔	09-May-2025	7 days	3 days	✔	



Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Anions and Nutrients : Sulfate in Water by IC</b>										
<b>HDPE [ON MECP]</b> Dorssers	E235.SO4	06-May-2025	08-May-2025	28 days	3 days	✓	09-May-2025	28 days	3 days	✓
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>										
<b>Amber glass - dissolved (unpreserved)</b> Dorssers	E358-L	06-May-2025	07-May-2025	3 days	2 days	✓	08-May-2025	28 days	1 days	✓
<b>Physical Tests : Alkalinity Species by Titration</b>										
<b>HDPE [ON MECP]</b> Dorssers	E290	06-May-2025	08-May-2025	14 days	3 days	✓	08-May-2025	14 days	3 days	✓
<b>Physical Tests : pH by Meter</b>										
<b>HDPE [ON MECP]</b> Dorssers	E108	06-May-2025	08-May-2025	14 days	3 days	✓	08-May-2025	14 days	3 days	✓
<b>Physical Tests : TDS by Gravimetry</b>										
<b>HDPE [ON MECP]</b> Dorssers	E162	06-May-2025	----	----	----		12-May-2025	7 days	7 days	✓
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>										
<b>HDPE total (nitric acid)</b> Dorssers	E420	06-May-2025	08-May-2025	180 days	2 days	✓	08-May-2025	180 days	2 days	✓
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Dorssers	E611D	06-May-2025	09-May-2025	14 days	3 days	✓	09-May-2025	14 days	3 days	✓
<b>Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Dorssers	E611E	06-May-2025	09-May-2025	14 days	3 days	✓	09-May-2025	14 days	3 days	✓

**Legend & Qualifier Definitions**

Rec. HT: ALS recommended hold time (see units).



## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
pH by Meter	E108	1985884	1	19	5.2	5.0	✔
TDS by Gravimetry	E162	1988040	1	19	5.2	5.0	✔
Bromide in Water by IC	E235.Br	1985886	1	6	16.6	5.0	✔
Chloride in Water by IC	E235.Cl	1985890	1	19	5.2	5.0	✔
Fluoride in Water by IC	E235.F	1985887	1	14	7.1	5.0	✔
Nitrite in Water by IC	E235.NO2	1985888	1	19	5.2	5.0	✔
Nitrate in Water by IC	E235.NO3	1985885	1	20	5.0	5.0	✔
Sulfate in Water by IC	E235.SO4	1985889	1	19	5.2	5.0	✔
Alkalinity Species by Titration	E290	1985882	1	20	5.0	5.0	✔
Ammonia by Fluorescence	E298	1985427	1	20	5.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1984265	1	6	16.6	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1985881	1	17	5.8	5.0	✔
Total Metals in Water by CRC ICPMS	E420	1984956	1	20	5.0	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1987992	1	20	5.0	5.0	✔
VOCs (Prairies List) by Headspace GC-MS	E611E	1987991	1	11	9.0	5.0	✔
<b>Laboratory Control Samples (LCS)</b>							
pH by Meter	E108	1985884	1	19	5.2	5.0	✔
TDS by Gravimetry	E162	1988040	1	19	5.2	5.0	✔
Bromide in Water by IC	E235.Br	1985886	1	6	16.6	5.0	✔
Chloride in Water by IC	E235.Cl	1985890	1	19	5.2	5.0	✔
Fluoride in Water by IC	E235.F	1985887	1	14	7.1	5.0	✔
Nitrite in Water by IC	E235.NO2	1985888	1	19	5.2	5.0	✔
Nitrate in Water by IC	E235.NO3	1985885	1	20	5.0	5.0	✔
Sulfate in Water by IC	E235.SO4	1985889	1	19	5.2	5.0	✔
Alkalinity Species by Titration	E290	1985882	1	20	5.0	5.0	✔
Ammonia by Fluorescence	E298	1985427	1	20	5.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1984265	1	6	16.6	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1985881	1	17	5.8	5.0	✔
Total Metals in Water by CRC ICPMS	E420	1984956	1	20	5.0	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1987992	1	20	5.0	5.0	✔
VOCs (Prairies List) by Headspace GC-MS	E611E	1987991	1	11	9.0	5.0	✔
<b>Method Blanks (MB)</b>							
TDS by Gravimetry	E162	1988040	1	19	5.2	5.0	✔
Bromide in Water by IC	E235.Br	1985886	1	6	16.6	5.0	✔
Chloride in Water by IC	E235.Cl	1985890	1	19	5.2	5.0	✔



Matrix: **Water**

Evaluation: \* = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Fluoride in Water by IC	E235.F	1985887	1	14	7.1	5.0	✓
Nitrite in Water by IC	E235.NO2	1985888	1	19	5.2	5.0	✓
Nitrate in Water by IC	E235.NO3	1985885	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1985889	1	19	5.2	5.0	✓
Alkalinity Species by Titration	E290	1985882	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	1985427	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1984265	1	6	16.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1985881	1	17	5.8	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1984956	1	20	5.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1987992	1	20	5.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1987991	1	11	9.0	5.0	✓
<b>Matrix Spikes (MS)</b>							
Bromide in Water by IC	E235.Br	1985886	1	6	16.6	5.0	✓
Chloride in Water by IC	E235.Cl	1985890	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	1985887	1	14	7.1	5.0	✓
Nitrite in Water by IC	E235.NO2	1985888	1	19	5.2	5.0	✓
Nitrate in Water by IC	E235.NO3	1985885	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1985889	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	1985427	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1984265	1	6	16.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1985881	1	17	5.8	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1984956	1	20	5.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1987992	1	20	5.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1987991	1	11	9.0	5.0	✓



## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TDS by Gravimetry	E162 ALS Environmental - Waterloo	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC	E235.Br ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Waterloo	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Waterloo	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.  Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Waterloo	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
VOCs (Eastern Canada List) by Headspace GC-MS	E611D ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
VOCs (Prairies List) by Headspace GC-MS	E611E ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Hardness (Calculated) from Total Ca/Mg	EC100A ALS Environmental - Waterloo	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed as CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because hardness is a property of water due to dissolved divalent cations. In non-turbid waters, Hardness from total Ca/Mg is normally comparable to Dissolved Hardness, but may be biased high if particulate forms of Ca or Mg are present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Waterloo	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Waterloo	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Waterloo	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into a GC-MS-FID.

## QUALITY CONTROL REPORT

<p><b>Work Order</b> : <b>WT2510508</b></p> <p>Client : Pinchin Ltd.</p> <p>Contact : Deana Bettencourt</p> <p>Address : 225 Labrador Drive Unit #1 Waterloo ON Canada N2K 4M8</p> <p>Telephone : ----</p> <p>Project : WEST PERTH HIBBERT RESIDENTIAL</p> <p>PO : 33568.002</p> <p>C-O-C number : ----</p> <p>Sampler : CLIENT</p> <p>Site : West Perth</p> <p>Quote number : West Perth Landfill</p> <p>No. of samples received : 1</p> <p>No. of samples analysed : 1</p>	<p>Page : 1 of 14</p> <p>Laboratory : ALS Environmental - Waterloo</p> <p>Account Manager : Amanda Overholster</p> <p>Address : 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8</p> <p>Telephone : 1 416 817 2944</p> <p>Date Samples Received : 06-May-2025 20:00</p> <p>Date Analysis Commenced : 07-May-2025</p> <p>Issue Date : 13-May-2025 16:01</p>
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Fleming	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
David Tremblett	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Centralized Prep, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario

Page : 2 of 14  
Work Order : WT2510508  
Client : Pinchin Ltd.  
Project : WEST PERTH HIBBERT RESIDENTIAL



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## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

### Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

# = Indicates a QC result that did not meet the ALS DQO.

## Workorder Comments

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Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

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### Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: <b>Water</b>					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Physical Tests (QC Lot: 1985882)</b>											
WT2510515-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	6.9	7.4	0.5	Diff <2x LOR	----
<b>Physical Tests (QC Lot: 1985884)</b>											
WT2510515-001	Anonymous	pH	----	E108	0.10	pH units	6.51	6.74	3.47%	4%	----
<b>Physical Tests (QC Lot: 1988040)</b>											
WT2510373-001	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	630	631	0.159%	20%	----
<b>Anions and Nutrients (QC Lot: 1985427)</b>											
WT2510310-003	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1985881)</b>											
HA2501276-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0012	0.0014	0.0001	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1985885)</b>											
WT2510508-001	Dorssers	Nitrate (as N)	14797-55-8	E235.NO3	0.040	mg/L	0.079	0.087	0.008	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1985886)</b>											
WT2510508-001	Dorssers	Bromide	24959-67-9	E235.Br	0.20	mg/L	<0.20	<0.20	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1985887)</b>											
WT2510508-001	Dorssers	Fluoride	16984-48-8	E235.F	0.040	mg/L	1.90	1.90	0.164%	20%	----
<b>Anions and Nutrients (QC Lot: 1985888)</b>											
WT2510508-001	Dorssers	Nitrite (as N)	14797-65-0	E235.NO2	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1985889)</b>											
WT2510508-001	Dorssers	Sulfate (as SO4)	14808-79-8	E235.SO4	0.60	mg/L	174	174	0.116%	20%	----
<b>Anions and Nutrients (QC Lot: 1985890)</b>											
WT2510508-001	Dorssers	Chloride	16887-00-6	E235.Cl	1.00	mg/L	14.4	14.5	0.910%	20%	----
<b>Organic / Inorganic Carbon (QC Lot: 1984265)</b>											
TY2504281-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	6.94	7.07	1.96%	20%	----
<b>Total Metals (QC Lot: 1984956)</b>											
HA2501302-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.00781	0.00761	2.51%	20%	----
		Boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	33.7	33.2	1.57%	20%	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Total Metals (QC Lot: 1984956) - continued</b>											
HA2501302-001	Anonymous	Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.0300	0.0294	1.78%	20%	----
		Iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000092	0.000088	0.000004	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	3.60	3.62	0.345%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	0.234	0.233	0.001	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	1.32	1.30	1.22%	20%	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	7.93	7.71	2.76%	20%	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 1987991)</b>											
WT2510508-001	Dorssers	Trichlorobenzene, 1,2,4-	120-82-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 1987992)</b>											
WT2510508-001	Dorssers	Acetone	67-64-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Benzene	71-43-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Carbon disulfide	75-15-0	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E611D	2.0	µg/L	<2.0	<2.0	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Volatile Organic Compounds (QC Lot: 1987992) - continued</b>											
WT2510508-001	Dorssers	Dichloroethylene, cis-1,2-	156-59-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Hexane, n-	110-54-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Hexanone, 2-	591-78-6	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Styrene	100-42-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611D	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----



## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Physical Tests (QCLot: 1985882)</b>						
Alkalinity, bicarbonate (as CaCO <sub>3</sub> )	---	E290	1	mg/L	1.5	---
Alkalinity, carbonate (as CaCO <sub>3</sub> )	---	E290	1	mg/L	<1.0	---
Alkalinity, hydroxide (as CaCO <sub>3</sub> )	---	E290	1	mg/L	<1.0	---
Alkalinity, phenolphthalein (as CaCO <sub>3</sub> )	---	E290	1	mg/L	<1.0	---
Alkalinity, total (as CaCO <sub>3</sub> )	---	E290	1	mg/L	1.5	---
<b>Physical Tests (QCLot: 1988040)</b>						
Solids, total dissolved [TDS]	---	E162	10	mg/L	<10	---
<b>Anions and Nutrients (QCLot: 1985427)</b>						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
<b>Anions and Nutrients (QCLot: 1985881)</b>						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	---
<b>Anions and Nutrients (QCLot: 1985885)</b>						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 1985886)</b>						
Bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	---
<b>Anions and Nutrients (QCLot: 1985887)</b>						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 1985888)</b>						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	---
<b>Anions and Nutrients (QCLot: 1985889)</b>						
Sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
<b>Anions and Nutrients (QCLot: 1985890)</b>						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
<b>Organic / Inorganic Carbon (QCLot: 1984265)</b>						
Carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
<b>Total Metals (QCLot: 1984956)</b>						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 1984956) - continued</b>						
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
<b>Volatile Organic Compounds (QCLot: 1987991)</b>						
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	<1.0	----
<b>Volatile Organic Compounds (QCLot: 1987992)</b>						
Acetone	67-64-1	E611D	20	µg/L	<20	----
Benzene	71-43-2	E611D	0.5	µg/L	<0.50	----
Bromodichloromethane	75-27-4	E611D	0.5	µg/L	<0.50	----
Bromoform	75-25-2	E611D	0.5	µg/L	<0.50	----
Bromomethane	74-83-9	E611D	0.5	µg/L	<0.50	----
Carbon disulfide	75-15-0	E611D	1	µg/L	<1.0	----
Carbon tetrachloride	56-23-5	E611D	0.2	µg/L	<0.20	----
Chlorobenzene	108-90-7	E611D	0.5	µg/L	<0.50	----
Chloroethane	75-00-3	E611D	0.5	µg/L	<0.50	----
Chloroform	67-66-3	E611D	0.5	µg/L	<0.50	----
Chloromethane	74-87-3	E611D	2	µg/L	<2.0	----
Dibromochloromethane	124-48-1	E611D	0.5	µg/L	<0.50	----
Dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	<0.20	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	<0.50	----
Dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	<0.50	----
Dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	<0.50	----
Dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	<0.50	----
Dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	<0.50	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	<0.50	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 1987992) - continued</b>						
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	<0.50	----
Dichloromethane	75-09-2	E611D	1	µg/L	<1.0	----
Dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	<0.50	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	<0.30	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	<0.30	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	<0.50	----
Hexane, n-	110-54-3	E611D	0.5	µg/L	<0.50	----
Hexanone, 2-	591-78-6	E611D	20	µg/L	<20	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	<0.50	----
Styrene	100-42-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,1,2,2-	79-34-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611D	0.5	µg/L	<0.50	----
Trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	<0.50	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	<0.50	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	<0.50	----
Trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	<0.50	----
Vinyl chloride	75-01-4	E611D	0.2	µg/L	<0.20	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	<0.30	----



## Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
<b>Physical Tests (QCLot: 1985882)</b>									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	100	85.0	115	----
<b>Physical Tests (QCLot: 1985884)</b>									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
<b>Physical Tests (QCLot: 1988040)</b>									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	101	85.0	115	----
<b>Anions and Nutrients (QCLot: 1985427)</b>									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.6	85.0	115	----
<b>Anions and Nutrients (QCLot: 1985881)</b>									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.05 mg/L	104	80.0	120	----
<b>Anions and Nutrients (QCLot: 1985885)</b>									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	99.0	90.0	110	----
<b>Anions and Nutrients (QCLot: 1985886)</b>									
Bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	99.9	85.0	115	----
<b>Anions and Nutrients (QCLot: 1985887)</b>									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	104	90.0	110	----
<b>Anions and Nutrients (QCLot: 1985888)</b>									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	99.7	90.0	110	----
<b>Anions and Nutrients (QCLot: 1985889)</b>									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
<b>Anions and Nutrients (QCLot: 1985890)</b>									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.5	90.0	110	----
<b>Organic / Inorganic Carbon (QCLot: 1984265)</b>									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	96.3	80.0	120	----
<b>Total Metals (QCLot: 1984956)</b>									
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	103	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	111	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.012 mg/L	110	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	0.05 mg/L	102	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	106	80.0	120	----



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
<b>Total Metals (QCLot: 1984956) - continued</b>									
Calcium, total	7440-70-2	E420	0.05	mg/L	2.5 mg/L	102	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.012 mg/L	105	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.012 mg/L	105	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	0.05 mg/L	104	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	106	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	2.5 mg/L	114	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.012 mg/L	106	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	2.5 mg/L	101	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	108	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	0.5 mg/L	105	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	2.5 mg/L	104	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	106	80.0	120	----
<b>Volatile Organic Compounds (QCLot: 1987991)</b>									
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	100 µg/L	99.7	70.0	130	----
<b>Volatile Organic Compounds (QCLot: 1987992)</b>									
Acetone	67-64-1	E611D	20	µg/L	100 µg/L	114	70.0	130	----
Benzene	71-43-2	E611D	0.5	µg/L	100 µg/L	110	70.0	130	----
Bromodichloromethane	75-27-4	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Bromoform	75-25-2	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Bromomethane	74-83-9	E611D	0.5	µg/L	100 µg/L	90.7	60.0	140	----
Carbon disulfide	75-15-0	E611D	1	µg/L	100 µg/L	109	70.0	130	----
Carbon tetrachloride	56-23-5	E611D	0.2	µg/L	100 µg/L	109	70.0	130	----
Chlorobenzene	108-90-7	E611D	0.5	µg/L	100 µg/L	104	70.0	130	----
Chloroethane	75-00-3	E611D	0.5	µg/L	100 µg/L	113	60.0	140	----
Chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	107	70.0	130	----
Chloromethane	74-87-3	E611D	2	µg/L	100 µg/L	122	60.0	140	----
Dibromochloromethane	124-48-1	E611D	0.5	µg/L	100 µg/L	101	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	100 µg/L	96.2	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	108	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	100 µg/L	111	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	112	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	100 µg/L	124	60.0	140	----
Dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	100 µg/L	101	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	100 µg/L	114	70.0	130	----



Sub-Matrix: **Water**

Laboratory Control Sample (LCS) Report

Analyte	CAS Number	Method	LOR	Unit	Spike		Recovery (%)		Recovery Limits (%)		Qualifier
					Target Concentration	LCS	Low	High			
<b>Volatile Organic Compounds (QCLot: 1987992) - continued</b>											
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	100 µg/L	107	70.0	130	---		
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	100 µg/L	111	70.0	130	---		
Dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	104	70.0	130	---		
Dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	100 µg/L	101	70.0	130	---		
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	100 µg/L	96.7	70.0	130	---		
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	100 µg/L	94.4	70.0	130	---		
Ethylbenzene	100-41-4	E611D	0.5	µg/L	100 µg/L	107	70.0	130	---		
Hexane, n-	110-54-3	E611D	0.5	µg/L	100 µg/L	122	70.0	130	---		
Hexanone, 2-	591-78-6	E611D	20	µg/L	100 µg/L	71.1	70.0	130	---		
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	100 µg/L	101	70.0	130	---		
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	100 µg/L	77.4	70.0	130	---		
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	100 µg/L	105	70.0	130	---		
Styrene	100-42-5	E611D	0.5	µg/L	100 µg/L	99.2	70.0	130	---		
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	100 µg/L	97.7	70.0	130	---		
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	100 µg/L	105	70.0	130	---		
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	110	70.0	130	---		
Toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	106	70.0	130	---		
Trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	100 µg/L	99.6	70.0	130	---		
Trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	100 µg/L	97.5	70.0	130	---		
Trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	110	70.0	130	---		
Trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	100 µg/L	112	60.0	140	---		
Vinyl chloride	75-01-4	E611D	0.2	µg/L	100 µg/L	120	60.0	140	---		
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	200 µg/L	103	70.0	130	---		
Xylene, o-	95-47-6	E611D	0.3	µg/L	100 µg/L	106	70.0	130	---		



## Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Anions and Nutrients (QCLot: 1985427)</b>										
WT2510310-003	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.103 mg/L	0.1 mg/L	103	75.0	125	----
<b>Anions and Nutrients (QCLot: 1985881)</b>										
HA2501276-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0184 mg/L	0.02 mg/L	94.1	70.0	130	----
<b>Anions and Nutrients (QCLot: 1985885)</b>										
WT2510508-001	Dorssers	Nitrate (as N)	14797-55-8	E235.NO3	4.84 mg/L	5 mg/L	96.9	75.0	125	----
<b>Anions and Nutrients (QCLot: 1985886)</b>										
WT2510508-001	Dorssers	Bromide	24959-67-9	E235.Br	0.97 mg/L	1 mg/L	96.6	75.0	125	----
<b>Anions and Nutrients (QCLot: 1985887)</b>										
WT2510508-001	Dorssers	Fluoride	16984-48-8	E235.F	2.01 mg/L	2 mg/L	100	75.0	125	----
<b>Anions and Nutrients (QCLot: 1985888)</b>										
WT2510508-001	Dorssers	Nitrite (as N)	14797-65-0	E235.NO2	0.984 mg/L	1 mg/L	98.4	75.0	125	----
<b>Anions and Nutrients (QCLot: 1985889)</b>										
WT2510508-001	Dorssers	Sulfate (as SO4)	14808-79-8	E235.SO4	194 mg/L	200 mg/L	96.9	75.0	125	----
<b>Anions and Nutrients (QCLot: 1985890)</b>										
WT2510508-001	Dorssers	Chloride	16887-00-6	E235.Cl	196 mg/L	200 mg/L	98.2	75.0	125	----
<b>Organic / Inorganic Carbon (QCLot: 1984265)</b>										
TY2504281-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	----	ND	70.0	130	----
<b>Total Metals (QCLot: 1984956)</b>										
HA2501302-002	Anonymous	Aluminum, total	7429-90-5	E420	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0521 mg/L	0.05 mg/L	104	70.0	130	----
		Barium, total	7440-39-3	E420	0.0121 mg/L	0.012 mg/L	96.6	70.0	130	----
		Boron, total	7440-42-8	E420	0.051 mg/L	0.05 mg/L	102	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00495 mg/L	0.005 mg/L	99.0	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	----	ND	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0128 mg/L	0.012 mg/L	102	70.0	130	----
		Copper, total	7440-50-8	E420	ND mg/L	----	ND	70.0	130	----
		Iron, total	7439-89-6	E420	0.050 mg/L	0.05 mg/L	101	70.0	130	----
		Lead, total	7439-92-1	E420	0.0250 mg/L	0.025 mg/L	99.8	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	----	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	0.0128 mg/L	0.012 mg/L	102	70.0	130	----
		Potassium, total	7440-09-7	E420	2.46 mg/L	2.5 mg/L	98.2	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0501 mg/L	0.05 mg/L	100	70.0	130	----
		Silicon, total	7440-21-3	E420	ND mg/L	----	ND	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	----	ND	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Total Metals (QCLot: 1984956) - continued</b>										
HA2501302-002	Anonymous	Zinc, total	7440-66-6	E420	0.0238 mg/L	0.025 mg/L	95.0	70.0	130	---
<b>Volatile Organic Compounds (QCLot: 1987991)</b>										
WT2510508-001	Dorssers	Trichlorobenzene, 1,2,4-	120-82-1	E611E	98.4 µg/L	100 µg/L	98.4	60.0	140	---
<b>Volatile Organic Compounds (QCLot: 1987992)</b>										
WT2510508-001	Dorssers	Acetone	67-64-1	E611D	101 µg/L	100 µg/L	101	60.0	140	---
		Benzene	71-43-2	E611D	101 µg/L	100 µg/L	101	60.0	140	---
		Bromodichloromethane	75-27-4	E611D	97.6 µg/L	100 µg/L	97.6	60.0	140	---
		Bromoform	75-25-2	E611D	95.4 µg/L	100 µg/L	95.4	60.0	140	---
		Bromomethane	74-83-9	E611D	79.1 µg/L	100 µg/L	79.1	60.0	140	---
		Carbon disulfide	75-15-0	E611D	95.1 µg/L	100 µg/L	95.1	60.0	140	---
		Carbon tetrachloride	56-23-5	E611D	98.4 µg/L	100 µg/L	98.4	60.0	140	---
		Chlorobenzene	108-90-7	E611D	96.1 µg/L	100 µg/L	96.1	60.0	140	---
		Chloroethane	75-00-3	E611D	100 µg/L	100 µg/L	100	60.0	140	---
		Chloroform	67-66-3	E611D	98.8 µg/L	100 µg/L	98.8	60.0	140	---
		Chloromethane	74-87-3	E611D	103 µg/L	100 µg/L	103	60.0	140	---
		Dibromochloromethane	124-48-1	E611D	91.4 µg/L	100 µg/L	91.4	60.0	140	---
		Dibromoethane, 1,2-	106-93-4	E611D	85.0 µg/L	100 µg/L	85.0	60.0	140	---
		Dichlorobenzene, 1,2-	95-50-1	E611D	99.5 µg/L	100 µg/L	99.5	60.0	140	---
		Dichlorobenzene, 1,3-	541-73-1	E611D	101 µg/L	100 µg/L	101	60.0	140	---
		Dichlorobenzene, 1,4-	106-46-7	E611D	102 µg/L	100 µg/L	102	60.0	140	---
		Dichlorodifluoromethane	75-71-8	E611D	99.3 µg/L	100 µg/L	99.3	60.0	140	---
		Dichloroethane, 1,1-	75-34-3	E611D	96.8 µg/L	100 µg/L	96.8	60.0	140	---
		Dichloroethane, 1,2-	107-06-2	E611D	89.1 µg/L	100 µg/L	89.1	60.0	140	---
		Dichloroethylene, 1,1-	75-35-4	E611D	102 µg/L	100 µg/L	102	60.0	140	---
		Dichloroethylene, cis-1,2-	156-59-2	E611D	96.7 µg/L	100 µg/L	96.7	60.0	140	---
		Dichloroethylene, trans-1,2-	156-60-5	E611D	101 µg/L	100 µg/L	101	60.0	140	---
		Dichloromethane	75-09-2	E611D	92.8 µg/L	100 µg/L	92.8	60.0	140	---
		Dichloropropane, 1,2-	78-87-5	E611D	91.8 µg/L	100 µg/L	91.8	60.0	140	---
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	89.6 µg/L	100 µg/L	89.6	60.0	140	---
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	82.3 µg/L	100 µg/L	82.3	60.0	140	---
		Ethylbenzene	100-41-4	E611D	98.7 µg/L	100 µg/L	98.7	60.0	140	---
		Hexane, n-	110-54-3	E611D	106 µg/L	100 µg/L	106	60.0	140	---
		Hexanone, 2-	591-78-6	E611D	62 µg/L	100 µg/L	61.8	60.0	140	---
		Methyl ethyl ketone [MEK]	78-93-3	E611D	92 µg/L	100 µg/L	92.2	60.0	140	---
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	72 µg/L	100 µg/L	72.3	60.0	140	---
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	95.6 µg/L	100 µg/L	95.6	60.0	140	---
		Styrene	100-42-5	E611D	91.1 µg/L	100 µg/L	91.1	60.0	140	---
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	90.0 µg/L	100 µg/L	90.0	60.0	140	---
		Tetrachloroethane, 1,1,1,2,2-	79-34-5	E611D	96.3 µg/L	100 µg/L	96.3	60.0	140	---
		Tetrachloroethylene	127-18-4	E611D	97.3 µg/L	100 µg/L	97.3	60.0	140	---
		Toluene	108-88-3	E611D	92.7 µg/L	100 µg/L	92.7	60.0	140	---
		Trichloroethane, 1,1,1-	71-55-6	E611D	91.3 µg/L	100 µg/L	91.3	60.0	140	---
		Trichloroethane, 1,1,2-	79-00-5	E611D	84.6 µg/L	100 µg/L	84.6	60.0	140	---

Page : 14 of 14  
 Work Order : WT2510508  
 Client : Pinchin Ltd.  
 Project : WEST PERTH HIBBERT RESIDENTIAL



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
<b>Volatile Organic Compounds (QCLot: 1987992) - continued</b>										
WT2510508-001	Dorssers	Trichloroethylene	79-01-6	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Trichlorofluoromethane	75-69-4	E611D	100 µg/L	100 µg/L	100	60.0	140	----
		Vinyl chloride	75-01-4	E611D	103 µg/L	100 µg/L	103	60.0	140	----
		Xylene, m+p-	179601-23-1	E611D	192 µg/L	200 µg/L	96.2	60.0	140	----
		Xylene, o-	95-47-6	E611D	99.0 µg/L	100 µg/L	99.0	60.0	140	----





**CERTIFICATE OF ANALYSIS**

**Work Order** : **WT2510543**  
**Client** : **Pinchin Ltd.**  
**Contact** : Deana Bettencourt  
**Address** : 225 Labrador Drive Unit #1  
 Waterloo Ontario Canada N2K 4M8  
**Telephone** : ----  
**Project** : WEST PERTH HIBBERT SW  
**PO** : 333568.002  
**C-O-C number** : ----  
**Sampler** : CLIENT  
**Site** : West Perth  
**Quote number** : West Perth Landfill  
**No. of samples received** : 3  
**No. of samples analysed** : 3

**Laboratory** : ALS Environmental - Waterloo  
**Account Manager** : Amanda Overholster  
**Address** : 60 Northland Road, Unit 1  
 Waterloo ON Canada N2V 2B8  
**E-mail** : Amanda.Overholster@ALSGlobal.com  
**Telephone** : 1 416 817 2944  
**Date Samples Received** : 06-May-2025 20:00  
**Date Analysis Commenced** : 07-May-2025  
**Issue Date** : 13-May-2025 16:01

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

**Signatories**

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Metals, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Centralized Prep, Waterloo, Ontario



## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key: CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.  
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	no units
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

## Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW1	SW2	DUP-03	----	----
Client sampling date / time					06-May-2025 02:30	06-May-2025 03:00	06-May-2025 03:00	----	----	
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510543-001	WT2510543-002	WT2510543-003	----	----	
					Result	Result	Result	----	----	
<b>Sample Preparation</b>										
Dissolved carbon filtration location	----	EP358/WT	-	-	lab	lab	lab	----	----	
<b>Physical Tests</b>										
Alkalinity, bicarbonate (as CaCO3)	----	E290/WT	1.0	mg/L	220	226	227	----	----	
Alkalinity, carbonate (as CaCO3)	----	E290/WT	1.0	mg/L	6.3	10.1	9.4	----	----	
Alkalinity, hydroxide (as CaCO3)	----	E290/WT	1.0	mg/L	<1.0	<1.0	<1.0	----	----	
Alkalinity, phenolphthalein (as CaCO3)	----	E290/WT	1.0	mg/L	3.2	5.0	4.7	----	----	
Alkalinity, total (as CaCO3)	----	E290/WT	1.0	mg/L	226	236	236	----	----	
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/WT	0.50	mg/L	284	281	287	----	----	
pH	----	E108/WT	0.10	pH units	8.35	8.41	8.40	----	----	
Solids, total dissolved [TDS]	----	E162/WT	10	mg/L	342 <sup>DLDS</sup>	356 <sup>DLDS</sup>	351 <sup>DLDS</sup>	----	----	
<b>Anions and Nutrients</b>										
Ammonia, total (as N)	7664-41-7	E298/WT	0.0050	mg/L	0.0126	0.0172	0.0162	----	----	
Bromide	24959-67-9	E235.Br/WT	0.10	mg/L	<0.10	<0.10	<0.10	----	----	
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L	25.8	27.4	27.4	----	----	
Fluoride	16984-48-8	E235.F/WT	0.020	mg/L	0.180	0.181	0.182	----	----	
Nitrite (as N)	14797-65-0	E235.NO2/WT	0.010	mg/L	0.046	0.044	0.044	----	----	
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	0.0010	mg/L	0.0050	0.0079	0.0073	----	----	
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	0.30	mg/L	10.1	10.6	10.5	----	----	
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L	5.74	6.00	5.96	----	----	
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	0.0200	mg/L	5.79	6.04	6.00	----	----	



## Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	SW1	SW2	DUP-03	----	----
					Client sampling date / time	06-May-2025 02:30	06-May-2025 03:00	06-May-2025 03:00	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510543-001	WT2510543-002	WT2510543-003	----	----	
					Result	Result	Result	----	----	
<b>Organic / Inorganic Carbon</b>										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L	2.77	2.66	2.60	----	----	
<b>Total Metals</b>										
Aluminum, total	7429-90-5	E420/WT	0.0030	mg/L	0.176	0.0528	0.0387	----	----	
Arsenic, total	7440-38-2	E420/WT	0.00010	mg/L	0.00038	0.00030	0.00029	----	----	
Barium, total	7440-39-3	E420/WT	0.00010	mg/L	0.0395	0.0399	0.0394	----	----	
Boron, total	7440-42-8	E420/WT	0.010	mg/L	0.014	0.016	0.016	----	----	
Cadmium, total	7440-43-9	E420/WT	0.0000050	mg/L	0.0000198	0.0000094	0.0000121	----	----	
Calcium, total	7440-70-2	E420/WT	0.050	mg/L	81.8	81.5	83.2	----	----	
Chromium, total	7440-47-3	E420/WT	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----	
Copper, total	7440-50-8	E420/WT	0.00050	mg/L	0.00127	0.00095	0.00087	----	----	
Iron, total	7439-89-6	E420/WT	0.010	mg/L	0.291	0.087	0.068	----	----	
Lead, total	7439-92-1	E420/WT	0.000050	mg/L	0.000280	0.000067	<0.000050	----	----	
Magnesium, total	7439-95-4	E420/WT	0.0050	mg/L	19.3	18.9	19.2	----	----	
Manganese, total	7439-96-5	E420/WT	0.00010	mg/L	0.0161	0.00837	0.00729	----	----	
Potassium, total	7440-09-7	E420/WT	0.050	mg/L	1.85	1.90	1.90	----	----	
Selenium, total	7782-49-2	E420/WT	0.000050	mg/L	0.000363	0.000330	0.000326	----	----	
Silicon, total	7440-21-3	E420/WT	0.10	mg/L	0.78	0.76	0.76	----	----	
Sodium, total	7440-23-5	E420/WT	0.050	mg/L	10.5	11.7	11.9	----	----	
Zinc, total	7440-66-6	E420/WT	0.0030	mg/L	0.0044	<0.0030	<0.0030	----	----	
<b>Dissolved Metals</b>										
Aluminum, dissolved	7429-90-5	E421/WT	0.0010	mg/L	0.0027	0.0030	0.0052	----	----	



**Analytical Results**

**Sub-Matrix: Water**  
**(Matrix: Water)**

					Client sample ID	SW1	SW2	DUP-03	----	----
					Client sampling date / time	06-May-2025 02:30	06-May-2025 03:00	06-May-2025 03:00	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510543-001	WT2510543-002	WT2510543-003	----	----	
					Result	Result	Result	----	----	
<b>Dissolved Metals</b>										
<b>Dissolved metals filtration location</b>	----	EP421/WT	-	-	Laboratory	Laboratory	Laboratory	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.




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## QUALITY CONTROL INTERPRETIVE REPORT

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<p><b>Work Order</b> : <b>WT2510543</b></p> <p><b>Client</b> : <b>Pinchin Ltd.</b></p> <p><b>Contact</b> : Deana Bettencourt</p> <p><b>Address</b> : 225 Labrador Drive Unit #1 Waterloo ON Canada N2K 4M8</p> <p><b>Telephone</b> : ----</p> <p><b>Project</b> : WEST PERTH HIBBERT SW</p> <p><b>PO</b> : 333568.002</p> <p><b>C-O-C number</b> : ----</p> <p><b>Sampler</b> : CLIENT</p> <p><b>Site</b> : West Perth</p> <p><b>Quote number</b> : West Perth Landfill</p> <p><b>No. of samples received</b> : 3</p> <p><b>No. of samples analysed</b> : 3</p>	<p><b>Page</b> : 1 of 12</p> <p><b>Laboratory</b> : ALS Environmental - Waterloo</p> <p><b>Account Manager</b> : Amanda Overholster</p> <p><b>Address</b> : 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8</p> <p><b>Telephone</b> : 1 416 817 2944</p> <p><b>Date Samples Received</b> : 06-May-2025 20:00</p> <p><b>Issue Date</b> : 13-May-2025 16:00</p>
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This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

**Key**

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
  - CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
  - DQO: Data Quality Objective.
  - LOR: Limit of Reporting (detection limit).
  - RPD: Relative Percent Difference.
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### ***Workorder Comments***

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Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

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### ***Summary of Outliers***

#### ***Outliers : Quality Control Samples***

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

#### ***Outliers: Reference Material (RM) Samples***

- No Reference Material (RM) Sample outliers occur.

***Outliers : Analysis Holding Time Compliance (Breaches)***

- Analysis Holding Time Outliers exist - please see following pages for full details.

***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
Amber glass total (sulfuric acid) DUP-03	E298	06-May-2025	08-May-2025	28 days	2 days	✔	09-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
Amber glass total (sulfuric acid) SW2	E298	06-May-2025	08-May-2025	28 days	2 days	✔	09-May-2025	28 days	2 days	✔	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
Amber glass total (sulfuric acid) SW1	E298	06-May-2025	08-May-2025	28 days	3 days	✔	09-May-2025	28 days	3 days	✔	
<b>Anions and Nutrients : Bromide in Water by IC</b>											
HDPE [ON MECP] DUP-03	E235.Br	06-May-2025	08-May-2025	28 days	3 days	✔	09-May-2025	28 days	3 days	✔	
<b>Anions and Nutrients : Bromide in Water by IC</b>											
HDPE [ON MECP] SW1	E235.Br	06-May-2025	08-May-2025	28 days	3 days	✔	09-May-2025	28 days	3 days	✔	
<b>Anions and Nutrients : Bromide in Water by IC</b>											
HDPE [ON MECP] SW2	E235.Br	06-May-2025	08-May-2025	28 days	3 days	✔	09-May-2025	28 days	3 days	✔	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE [ON MECP] DUP-03	E235.Cl	06-May-2025	08-May-2025	28 days	3 days	✔	09-May-2025	28 days	3 days	✔	



Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE [ON MECP] SW1	E235.Cl	06-May-2025	08-May-2025	28 days	3 days	✓	09-May-2025	28 days	3 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE [ON MECP] SW2	E235.Cl	06-May-2025	08-May-2025	28 days	3 days	✓	09-May-2025	28 days	3 days	✓	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)</b>											
HDPE [ON MECP] DUP-03	E378-U	06-May-2025	08-May-2025	7 days	3 days	✓	10-May-2025	7 days	3 days	✓	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)</b>											
HDPE [ON MECP] SW1	E378-U	06-May-2025	08-May-2025	7 days	3 days	✓	10-May-2025	7 days	3 days	✓	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)</b>											
HDPE [ON MECP] SW2	E378-U	06-May-2025	08-May-2025	7 days	3 days	✓	10-May-2025	7 days	3 days	✓	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE [ON MECP] DUP-03	E235.F	06-May-2025	08-May-2025	28 days	3 days	✓	09-May-2025	28 days	3 days	✓	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE [ON MECP] SW1	E235.F	06-May-2025	08-May-2025	28 days	3 days	✓	09-May-2025	28 days	3 days	✓	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE [ON MECP] SW2	E235.F	06-May-2025	08-May-2025	28 days	3 days	✓	09-May-2025	28 days	3 days	✓	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE [ON MECP] DUP-03	E235.NO3	06-May-2025	08-May-2025	7 days	3 days	✓	09-May-2025	7 days	3 days	✓	



Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE [ON MECP] SW1	E235.NO3	06-May-2025	08-May-2025	7 days	3 days	✓	09-May-2025	7 days	3 days	✓	
<b>Anions and Nutrients : Nitrate in Water by IC</b>											
HDPE [ON MECP] SW2	E235.NO3	06-May-2025	08-May-2025	7 days	3 days	✓	09-May-2025	7 days	3 days	✓	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE [ON MECP] DUP-03	E235.NO2	06-May-2025	08-May-2025	7 days	3 days	✓	09-May-2025	7 days	3 days	✓	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE [ON MECP] SW1	E235.NO2	06-May-2025	08-May-2025	7 days	3 days	✓	09-May-2025	7 days	3 days	✓	
<b>Anions and Nutrients : Nitrite in Water by IC</b>											
HDPE [ON MECP] SW2	E235.NO2	06-May-2025	08-May-2025	7 days	3 days	✓	09-May-2025	7 days	3 days	✓	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE [ON MECP] DUP-03	E235.SO4	06-May-2025	08-May-2025	28 days	3 days	✓	09-May-2025	28 days	3 days	✓	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE [ON MECP] SW1	E235.SO4	06-May-2025	08-May-2025	28 days	3 days	✓	09-May-2025	28 days	3 days	✓	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE [ON MECP] SW2	E235.SO4	06-May-2025	08-May-2025	28 days	3 days	✓	09-May-2025	28 days	3 days	✓	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE - dissolved (lab filtered) DUP-03	E421	06-May-2025	12-May-2025	0 hrs	152 hrs	* UCP	12-May-2025	0 hrs	152 hrs	* UCP	



Matrix: **Water** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE - dissolved (lab filtered) SW1	E421	06-May-2025	12-May-2025	0 hrs	152 hrs	* UCP	12-May-2025	0 hrs	152 hrs	* UCP	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
HDPE - dissolved (lab filtered) SW2	E421	06-May-2025	12-May-2025	0 hrs	152 hrs	* UCP	12-May-2025	0 hrs	152 hrs	* UCP	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass - dissolved (lab preserved) [ON MECP] DUP-03	E358-L	06-May-2025	07-May-2025	3 days	2 days	✓	08-May-2025	28 days	1 days	✓	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass - dissolved (lab preserved) [ON MECP] SW1	E358-L	06-May-2025	07-May-2025	3 days	2 days	✓	08-May-2025	28 days	1 days	✓	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
Amber glass - dissolved (lab preserved) [ON MECP] SW2	E358-L	06-May-2025	07-May-2025	3 days	2 days	✓	08-May-2025	28 days	1 days	✓	
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE [ON MECP] DUP-03	E290	06-May-2025	08-May-2025	14 days	3 days	✓	08-May-2025	14 days	3 days	✓	
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE [ON MECP] SW1	E290	06-May-2025	08-May-2025	14 days	3 days	✓	08-May-2025	14 days	3 days	✓	
<b>Physical Tests : Alkalinity Species by Titration</b>											
HDPE [ON MECP] SW2	E290	06-May-2025	08-May-2025	14 days	3 days	✓	08-May-2025	14 days	3 days	✓	
<b>Physical Tests : pH by Meter</b>											
HDPE [ON MECP] DUP-03	E108	06-May-2025	08-May-2025	14 days	3 days	✓	08-May-2025	14 days	3 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
<b>Physical Tests : pH by Meter</b>											
HDPE [ON MECP] SW1	E108	06-May-2025	08-May-2025	14 days	3 days	✔	08-May-2025	14 days	3 days	✔	
<b>Physical Tests : pH by Meter</b>											
HDPE [ON MECP] SW2	E108	06-May-2025	08-May-2025	14 days	3 days	✔	08-May-2025	14 days	3 days	✔	
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE [ON MECP] DUP-03	E162	06-May-2025	----	----	----		12-May-2025	7 days	7 days	✔	
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE [ON MECP] SW1	E162	06-May-2025	----	----	----		12-May-2025	7 days	7 days	✔	
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE [ON MECP] SW2	E162	06-May-2025	----	----	----		12-May-2025	7 days	7 days	✔	
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>											
HDPE total (nitric acid) DUP-03	E420	06-May-2025	08-May-2025	180 days	2 days	✔	08-May-2025	180 days	2 days	✔	
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>											
HDPE total (nitric acid) SW1	E420	06-May-2025	08-May-2025	180 days	2 days	✔	08-May-2025	180 days	2 days	✔	
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>											
HDPE total (nitric acid) SW2	E420	06-May-2025	08-May-2025	180 days	2 days	✔	08-May-2025	180 days	2 days	✔	

**Legend & Qualifier Definitions**

Rec. HT: ALS recommended hold time (see units).

UCP: Unsuitable Container and/or Preservative used (invalidates standard hold time). Maximum hold time of zero applied. Test results may be biased low / unreliable, and may not meet regulatory requirements.



## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
pH by Meter	E108	1985884	1	19	5.2	5.0	✔
TDS by Gravimetry	E162	1988040	1	19	5.2	5.0	✔
Bromide in Water by IC	E235.Br	1985886	1	6	16.6	5.0	✔
Chloride in Water by IC	E235.Cl	1985890	1	19	5.2	5.0	✔
Fluoride in Water by IC	E235.F	1985887	1	14	7.1	5.0	✔
Nitrite in Water by IC	E235.NO2	1985888	1	19	5.2	5.0	✔
Nitrate in Water by IC	E235.NO3	1985885	1	20	5.0	5.0	✔
Sulfate in Water by IC	E235.SO4	1985889	1	19	5.2	5.0	✔
Alkalinity Species by Titration	E290	1985882	1	20	5.0	5.0	✔
Ammonia by Fluorescence	E298	1985427	1	20	5.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1984265	1	6	16.6	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1985881	1	17	5.8	5.0	✔
Total Metals in Water by CRC ICPMS	E420	1984956	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	1991547	1	3	33.3	5.0	✔
<b>Laboratory Control Samples (LCS)</b>							
pH by Meter	E108	1985884	1	19	5.2	5.0	✔
TDS by Gravimetry	E162	1988040	1	19	5.2	5.0	✔
Bromide in Water by IC	E235.Br	1985886	1	6	16.6	5.0	✔
Chloride in Water by IC	E235.Cl	1985890	1	19	5.2	5.0	✔
Fluoride in Water by IC	E235.F	1985887	1	14	7.1	5.0	✔
Nitrite in Water by IC	E235.NO2	1985888	1	19	5.2	5.0	✔
Nitrate in Water by IC	E235.NO3	1985885	1	20	5.0	5.0	✔
Sulfate in Water by IC	E235.SO4	1985889	1	19	5.2	5.0	✔
Alkalinity Species by Titration	E290	1985882	1	20	5.0	5.0	✔
Ammonia by Fluorescence	E298	1985427	1	20	5.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1984265	1	6	16.6	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1985881	1	17	5.8	5.0	✔
Total Metals in Water by CRC ICPMS	E420	1984956	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	1991547	1	3	33.3	5.0	✔
<b>Method Blanks (MB)</b>							
TDS by Gravimetry	E162	1988040	1	19	5.2	5.0	✔
Bromide in Water by IC	E235.Br	1985886	1	6	16.6	5.0	✔
Chloride in Water by IC	E235.Cl	1985890	1	19	5.2	5.0	✔
Fluoride in Water by IC	E235.F	1985887	1	14	7.1	5.0	✔
Nitrite in Water by IC	E235.NO2	1985888	1	19	5.2	5.0	✔



Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
<b>Method Blanks (MB) - Continued</b>							
Nitrate in Water by IC	E235.NO3	1985885	1	20	5.0	5.0	✔
Sulfate in Water by IC	E235.SO4	1985889	1	19	5.2	5.0	✔
Alkalinity Species by Titration	E290	1985882	1	20	5.0	5.0	✔
Ammonia by Fluorescence	E298	1985427	1	20	5.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1984265	1	6	16.6	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1985881	1	17	5.8	5.0	✔
Total Metals in Water by CRC ICPMS	E420	1984956	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	1991547	1	3	33.3	5.0	✔
<b>Matrix Spikes (MS)</b>							
Bromide in Water by IC	E235.Br	1985886	1	6	16.6	5.0	✔
Chloride in Water by IC	E235.Cl	1985890	1	19	5.2	5.0	✔
Fluoride in Water by IC	E235.F	1985887	1	14	7.1	5.0	✔
Nitrite in Water by IC	E235.NO2	1985888	1	19	5.2	5.0	✔
Nitrate in Water by IC	E235.NO3	1985885	1	20	5.0	5.0	✔
Sulfate in Water by IC	E235.SO4	1985889	1	19	5.2	5.0	✔
Ammonia by Fluorescence	E298	1985427	1	20	5.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1984265	1	6	16.6	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1985881	1	17	5.8	5.0	✔
Total Metals in Water by CRC ICPMS	E420	1984956	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	1991547	1	3	33.3	5.0	✔



## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TDS by Gravimetry	E162 ALS Environmental - Waterloo	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC	E235.Br ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Waterloo	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Waterloo	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.  Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Waterloo	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Waterloo	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Hardness (Calculated) from Total Ca/Mg	EC100A ALS Environmental - Waterloo	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed as CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because hardness is a property of water due to dissolved divalent cations. In non-turbid waters, Hardness from total Ca/Mg is normally comparable to Dissolved Hardness, but may be biased high if particulate forms of Ca or Mg are present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Waterloo	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Waterloo	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon

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Work Order : WT2510543  
Client : Pinchin Ltd.  
Project : WEST PERTH HIBBERT SW



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dissolved Metals Water Filtration	EP421 ALS Environmental - Waterloo	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: WT2510543</b>	<b>Page</b>	: 1 of 10
<b>Client</b>	: Pinchin Ltd.	<b>Laboratory</b>	: ALS Environmental - Waterloo
<b>Contact</b>	: Deana Bettencourt	<b>Account Manager</b>	: Amanda Overholster
<b>Address</b>	: 225 Labrador Drive Unit #1 Waterloo ON Canada N2K 4M8	<b>Address</b>	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
<b>Telephone</b>	: ----	<b>Telephone</b>	: 1 416 817 2944
<b>Project</b>	: WEST PERTH HIBBERT SW	<b>Date Samples Received</b>	: 06-May-2025 20:00
<b>PO</b>	: 333568.002	<b>Date Analysis Commenced</b>	: 07-May-2025
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 13-May-2025 16:00
<b>Sampler</b>	: CLIENT		
<b>Site</b>	: West Perth		
<b>Quote number</b>	: West Perth Landfill		
<b>No. of samples received</b>	: 3		
<b>No. of samples analysed</b>	: 3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Centralized Prep, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario

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Work Order : WT2510543  
Client : Pinchin Ltd.  
Project : WEST PERTH HIBBERT SW



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## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

# = Indicates a QC result that did not meet the ALS DQO.

## Workorder Comments

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Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

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### Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: <b>Water</b>					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Physical Tests (QC Lot: 1985882)</b>											
WT2510515-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	6.9	7.4	0.5	Diff <2x LOR	----
<b>Physical Tests (QC Lot: 1985884)</b>											
WT2510515-001	Anonymous	pH	----	E108	0.10	pH units	6.51	6.74	3.47%	4%	----
<b>Physical Tests (QC Lot: 1988040)</b>											
WT2510373-001	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	630	631	0.159%	20%	----
<b>Anions and Nutrients (QC Lot: 1985427)</b>											
WT2510310-003	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1985881)</b>											
HA2501276-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0012	0.0014	0.0001	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1985885)</b>											
WT2510508-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	0.040	mg/L	0.079	0.087	0.008	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1985886)</b>											
WT2510508-001	Anonymous	Bromide	24959-67-9	E235.Br	0.20	mg/L	<0.20	<0.20	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1985887)</b>											
WT2510508-001	Anonymous	Fluoride	16984-48-8	E235.F	0.040	mg/L	1.90	1.90	0.164%	20%	----
<b>Anions and Nutrients (QC Lot: 1985888)</b>											
WT2510508-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 1985889)</b>											
WT2510508-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.60	mg/L	174	174	0.116%	20%	----
<b>Anions and Nutrients (QC Lot: 1985890)</b>											
WT2510508-001	Anonymous	Chloride	16887-00-6	E235.Cl	1.00	mg/L	14.4	14.5	0.910%	20%	----
<b>Organic / Inorganic Carbon (QC Lot: 1984265)</b>											
TY2504281-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	6.94	7.07	1.96%	20%	----
<b>Total Metals (QC Lot: 1984956)</b>											
HA2501302-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.00781	0.00761	2.51%	20%	----
		Boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	33.7	33.2	1.57%	20%	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Total Metals (QC Lot: 1984956) - continued</b>											
HA2501302-001	Anonymous	Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.0300	0.0294	1.78%	20%	----
		Iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000092	0.000088	0.000004	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	3.60	3.62	0.345%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	0.234	0.233	0.001	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	1.32	1.30	1.22%	20%	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	7.93	7.71	2.76%	20%	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 1991547)</b>											
WT2510543-001	SW1	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0027	0.0020	0.0007	Diff <2x LOR	----



## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Physical Tests (QCLot: 1985882)</b>						
Alkalinity, bicarbonate (as CaCO <sub>3</sub> )	---	E290	1	mg/L	1.5	---
Alkalinity, carbonate (as CaCO <sub>3</sub> )	---	E290	1	mg/L	<1.0	---
Alkalinity, hydroxide (as CaCO <sub>3</sub> )	---	E290	1	mg/L	<1.0	---
Alkalinity, phenolphthalein (as CaCO <sub>3</sub> )	---	E290	1	mg/L	<1.0	---
Alkalinity, total (as CaCO <sub>3</sub> )	---	E290	1	mg/L	1.5	---
<b>Physical Tests (QCLot: 1988040)</b>						
Solids, total dissolved [TDS]	---	E162	10	mg/L	<10	---
<b>Anions and Nutrients (QCLot: 1985427)</b>						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
<b>Anions and Nutrients (QCLot: 1985881)</b>						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	---
<b>Anions and Nutrients (QCLot: 1985885)</b>						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 1985886)</b>						
Bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	---
<b>Anions and Nutrients (QCLot: 1985887)</b>						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 1985888)</b>						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	---
<b>Anions and Nutrients (QCLot: 1985889)</b>						
Sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
<b>Anions and Nutrients (QCLot: 1985890)</b>						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
<b>Organic / Inorganic Carbon (QCLot: 1984265)</b>						
Carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
<b>Total Metals (QCLot: 1984956)</b>						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---



Sub-Matrix: **Water**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
<b>Total Metals (QCLot: 1984956) - continued</b>						
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
<b>Dissolved Metals (QCLot: 1991547)</b>						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----



## Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
<b>Physical Tests (QCLot: 1985882)</b>									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	100	85.0	115	----
<b>Physical Tests (QCLot: 1985884)</b>									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
<b>Physical Tests (QCLot: 1988040)</b>									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	101	85.0	115	----
<b>Anions and Nutrients (QCLot: 1985427)</b>									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.6	85.0	115	----
<b>Anions and Nutrients (QCLot: 1985881)</b>									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.05 mg/L	104	80.0	120	----
<b>Anions and Nutrients (QCLot: 1985885)</b>									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	99.0	90.0	110	----
<b>Anions and Nutrients (QCLot: 1985886)</b>									
Bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	99.9	85.0	115	----
<b>Anions and Nutrients (QCLot: 1985887)</b>									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	104	90.0	110	----
<b>Anions and Nutrients (QCLot: 1985888)</b>									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	99.7	90.0	110	----
<b>Anions and Nutrients (QCLot: 1985889)</b>									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
<b>Anions and Nutrients (QCLot: 1985890)</b>									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.5	90.0	110	----
<b>Organic / Inorganic Carbon (QCLot: 1984265)</b>									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	96.3	80.0	120	----
<b>Total Metals (QCLot: 1984956)</b>									
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	103	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	111	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.012 mg/L	110	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	0.05 mg/L	102	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	106	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
<b>Total Metals (QCLot: 1984956) - continued</b>									
Calcium, total	7440-70-2	E420	0.05	mg/L	2.5 mg/L	102	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.012 mg/L	105	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.012 mg/L	105	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	0.05 mg/L	104	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	106	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	2.5 mg/L	114	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.012 mg/L	106	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	2.5 mg/L	101	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	108	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	0.5 mg/L	105	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	2.5 mg/L	104	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	106	80.0	120	----
<b>Dissolved Metals (QCLot: 1991547)</b>									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	0.1 mg/L	108	80.0	120	----



## Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Anions and Nutrients (QCLot: 1985427)</b>										
WT2510310-003	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.103 mg/L	0.1 mg/L	103	75.0	125	----
<b>Anions and Nutrients (QCLot: 1985881)</b>										
HA2501276-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0184 mg/L	0.02 mg/L	94.1	70.0	130	----
<b>Anions and Nutrients (QCLot: 1985885)</b>										
WT2510508-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	4.84 mg/L	5 mg/L	96.9	75.0	125	----
<b>Anions and Nutrients (QCLot: 1985886)</b>										
WT2510508-001	Anonymous	Bromide	24959-67-9	E235.Br	0.97 mg/L	1 mg/L	96.6	75.0	125	----
<b>Anions and Nutrients (QCLot: 1985887)</b>										
WT2510508-001	Anonymous	Fluoride	16984-48-8	E235.F	2.01 mg/L	2 mg/L	100	75.0	125	----
<b>Anions and Nutrients (QCLot: 1985888)</b>										
WT2510508-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.984 mg/L	1 mg/L	98.4	75.0	125	----
<b>Anions and Nutrients (QCLot: 1985889)</b>										
WT2510508-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	194 mg/L	200 mg/L	96.9	75.0	125	----
<b>Anions and Nutrients (QCLot: 1985890)</b>										
WT2510508-001	Anonymous	Chloride	16887-00-6	E235.Cl	196 mg/L	200 mg/L	98.2	75.0	125	----
<b>Organic / Inorganic Carbon (QCLot: 1984265)</b>										
TY2504281-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	----	ND	70.0	130	----
<b>Total Metals (QCLot: 1984956)</b>										
HA2501302-002	Anonymous	Aluminum, total	7429-90-5	E420	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0521 mg/L	0.05 mg/L	104	70.0	130	----
		Barium, total	7440-39-3	E420	0.0121 mg/L	0.012 mg/L	96.6	70.0	130	----
		Boron, total	7440-42-8	E420	0.051 mg/L	0.05 mg/L	102	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00495 mg/L	0.005 mg/L	99.0	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	----	ND	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0128 mg/L	0.012 mg/L	102	70.0	130	----
		Copper, total	7440-50-8	E420	ND mg/L	----	ND	70.0	130	----
		Iron, total	7439-89-6	E420	0.050 mg/L	0.05 mg/L	101	70.0	130	----
		Lead, total	7439-92-1	E420	0.0250 mg/L	0.025 mg/L	99.8	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	----	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	0.0128 mg/L	0.012 mg/L	102	70.0	130	----
		Potassium, total	7440-09-7	E420	2.46 mg/L	2.5 mg/L	98.2	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0501 mg/L	0.05 mg/L	100	70.0	130	----
		Silicon, total	7440-21-3	E420	ND mg/L	----	ND	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	----	ND	70.0	130	----

Page : 10 of 10  
 Work Order : WT2510543  
 Client : Pinchin Ltd.  
 Project : WEST PERTH HIBBERT SW



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
<b>Total Metals (QCLot: 1984956) - continued</b>										
HA2501302-002	Anonymous	Zinc, total	7440-66-6	E420	0.0238 mg/L	0.025 mg/L	95.0	70.0	130	----
<b>Dissolved Metals (QCLot: 1991547)</b>										
WT2510543-002	SW2	Aluminum, dissolved	7429-90-5	E421	0.111 mg/L	0.1 mg/L	111	70.0	130	----



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GC-442  
N-769  
MM-853

# Chain of Custody (COC) / Analytical Request Form

COC Number: 20 -

Canada Toll Free: 1 800 668 9878

Page 1 of 2

Environmental Division  
Waterloo  
Work Order Reference  
**WT2510543**



Telephone: +1 519 886 6910

SAMPLES ON HOLD  
EXTENDED STORAGE REQ  
SUSPECTED HAZARD (see r.)

<b>Report To</b> Contact and company name below will appear on the final report		<b>Reports / Recipients</b>			<b>Turnaround Time (TAT) Requested</b>						
Company:	Pinchin Ltd.	Select Report Format:	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)	<input checked="" type="checkbox"/> Routine [R] if received by 3pm M-F - no surcharges apply <input type="checkbox"/> 4 day [P4] if received by 3pm M-F - 20% rush surcharge r <input type="checkbox"/> 3 day [P3] if received by 3pm M-F - 25% rush surcharge r <input type="checkbox"/> 2 day [P2] if received by 3pm M-F - 50% rush surcharge r <input type="checkbox"/> 1 day [E] if received by 3pm M-F - 100% rush surcharge n <input type="checkbox"/> Same day [E2] if received by 10am M-S - 200% rush surch <input type="checkbox"/> fees may apply to rush requests on weekends, statutory holic <input type="checkbox"/> routine tests							
Contact:	Deana Bettencourt	Merge QC/QCI Reports with COA	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX							
Phone:	226-338-0989	Select Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	Email 1 or Fax: <u>dbettencourt@Pinchin.com</u> Email 2 Email 3							
Company address below will appear on the final report					<b>Date and Time Required for all E&amp;P TATs:</b>						
Street:	225 Labrador Drive, Unit #1				For all tests with rush TATs requested, please						
City/Province:	Waterloo, Ontario				<b>Analysis R</b>						
Postal Code:	N2K 4M8										
<b>Invoice To</b>		<b>Invoice Recipients</b>									
Same as Report To	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Select Invoice Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX								
Copy of Invoice with Report	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO										
Company:	Pinchin Ltd.	Email 1 or Fax: <u>dbettencourt@Pinchin.com</u> Email 2: <u>ap@pinchin.com</u>									
Contact:	Deana Bettencourt										
<b>Project Information</b>		<b>Oil and Gas Required Fields (client use)</b>									
ALS Account # / Quote #:	PINC100 / West Perth	AFE/Cost Center:	PO#								
Job #:	West Perth Hibbert SW	Major/Minor Code:	Routing Code:								
PO / AFE:	333568.002	Requisitioner:									
LSD:		Location:									
ALS Lab Work Order # (ALS use only): <b>WT2510543</b>		ALS Contact:	Amanda Overholster	Sampler:							
ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	<b>NUMBER OF CONTAINER</b>	Indicate Filtered (F), Preserved (P) or Filtered					
	SW1	06/05/25	2:30	SW		R	R	R			
	SW2	↓	3:00	↓		R	R	R			
	DUP-03	↓	3:00	↓		R	R	R			
						R	R	R			
						R	R	R			
						R	R	R			
						R	R	R			
						R	R	R			
						R	R	R			
<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b>		<b>Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)</b>			<b>SAMPLE RECEIPT DETAILS (ALS use only)</b>						
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input type="checkbox"/> NO					Cooling Method: <input type="checkbox"/> NONE <input checked="" type="checkbox"/> ICE <input type="checkbox"/> ICE PACKS <input type="checkbox"/> FROZEN <input type="checkbox"/> COOLING INITIATED						
Are samples for human consumption/ use? <input type="checkbox"/> YES <input type="checkbox"/> NO					Submission Comments identified on Sample Receipt Notification: <input type="checkbox"/> YES <input type="checkbox"/> NO						
					Cooler Custody Seals Intact: <input checked="" type="checkbox"/> YES <input type="checkbox"/> N/A Sample Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A						
					INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C			
								1.8			
<b>SHIPMENT RELEASE (client use)</b>		<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>			<b>FINAL SHIPMENT RECEPTION (ALS use only)</b>						
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Megan Laporte	06/05/25	5:00				FH	2025-05-06	20:00			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION  
 FAILURE TO COMPLETE ALL PORTIONS OF THIS FORM MAY DELAY ANALYSIS. PLEASE FILL IN THIS FORM LEGIBLY. BY THE USE OF THIS FORM THE USER ACKNOWLEDGES AND AGREES WITH THE TERMS AND CONDITIONS AS SPECIFIED ON THE BACK PAGE OF THE WHITE - REPORT COPY.  
 1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



**CERTIFICATE OF ANALYSIS**

**Work Order** : **WT2510693**  
**Client** : **Pinchin Ltd.**  
**Contact** : Deana Bettencourt  
**Address** : 225 Labrador Drive Unit #1  
 Waterloo Ontario Canada N2K 4M8  
**Telephone** : ----  
**Project** : WEST PERTH HIBBERT GW  
**PO** : 333568.002  
**C-O-C number** : 23-11 19736  
**Sampler** : ML/DH  
**Site** : ----  
**Quote number** : West Perth Landfill  
**No. of samples received** : 1  
**No. of samples analysed** : 1

**Laboratory** : ALS Environmental - Waterloo  
**Account Manager** : Amanda Overholster  
**Address** : 60 Northland Road, Unit 1  
 Waterloo ON Canada N2V 2B8  
**E-mail** : Amanda.Overholster@ALSGlobal.com  
**Telephone** : 1 416 817 2944  
**Date Samples Received** : 07-May-2025 16:30  
**Date Analysis Commenced** : 09-May-2025  
**Issue Date** : 12-May-2025 10:34

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

**Signatories**

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
David Tremblett	VOC Section Supervisor	VOC, Waterloo, Ontario



### General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key: CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.  
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
µg/L	micrograms per litre

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	TRIP BLANK-001	----	----	----	----
					Client sampling date / time	07-May-2025 09:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510693-001	----	----	----	----	
					Result	----	----	----	----	
<b>Volatile Organic Compounds</b>										
Acetone	67-64-1	E611D/WT	20	µg/L	<20	----	----	----	----	
Benzene	71-43-2	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Bromodichloromethane	75-27-4	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Bromoform	75-25-2	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Bromomethane	74-83-9	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Carbon disulfide	75-15-0	E611D/WT	1.0	µg/L	<1.0	----	----	----	----	
Carbon tetrachloride	56-23-5	E611D/WT	0.20	µg/L	<0.20	----	----	----	----	
Chlorobenzene	108-90-7	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Chloroethane	75-00-3	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Chloroform	67-66-3	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Chloromethane	74-87-3	E611D/WT	2.0	µg/L	<2.0	----	----	----	----	
Dibromochloromethane	124-48-1	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Dibromoethane, 1,2-	106-93-4	E611D/WT	0.20	µg/L	<0.20	----	----	----	----	
Dichlorobenzene, 1,2-	95-50-1	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Dichlorobenzene, 1,3-	541-73-1	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Dichlorodifluoromethane	75-71-8	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Dichloroethane, 1,1-	75-34-3	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Dichloroethane, 1,2-	107-06-2	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Dichloroethylene, 1,1-	75-35-4	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Dichloroethylene, cis-1,2-	156-59-2	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	



## Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	TRIP BLANK-001	----	----	----	----
					Client sampling date / time	07-May-2025 09:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510693-001	----	----	----	----	
					Result	----	----	----	----	
<b>Volatile Organic Compounds</b>										
Dichloroethylene, trans-1,2-	156-60-5	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Dichloromethane	75-09-2	E611D/WT	1.0	µg/L	<1.0	----	----	----	----	
Dichloropropane, 1,2-	78-87-5	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Dichloropropylene, cis-1,3-	10061-01-5	E611D/WT	0.30	µg/L	<0.30	----	----	----	----	
Dichloropropylene, trans-1,3-	10061-02-6	E611D/WT	0.30	µg/L	<0.30	----	----	----	----	
Ethylbenzene	100-41-4	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Hexane, n-	110-54-3	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Hexanone, 2-	591-78-6	E611D/WT	20	µg/L	<20	----	----	----	----	
Methyl ethyl ketone [MEK]	78-93-3	E611D/WT	20	µg/L	<20	----	----	----	----	
Methyl isobutyl ketone [MIBK]	108-10-1	E611D/WT	20	µg/L	<20	----	----	----	----	
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Styrene	100-42-5	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Tetrachloroethylene	127-18-4	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Toluene	108-88-3	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Trichlorobenzene, 1,2,4-	120-82-1	E611E/WT	1.0	µg/L	<1.0	----	----	----	----	
Trichloroethane, 1,1,1-	71-55-6	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Trichloroethane, 1,1,2-	79-00-5	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Trichloroethylene	79-01-6	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	
Trichlorofluoromethane	75-69-4	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	



### Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

					Client sample ID	TRIP BLANK-001	----	----	----	----
					Client sampling date / time	07-May-2025 09:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2510693-001	----	----	----	----	----
						Result	----	----	----	----
<b>Volatile Organic Compounds</b>										
Vinyl chloride	75-01-4	E611D/WT	0.20	µg/L	<0.20	----	----	----	----	----
Xylene, m+p-	179601-23-1	E611D/WT	0.40	µg/L	<0.40	----	----	----	----	----
Xylene, o-	95-47-6	E611D/WT	0.30	µg/L	<0.30	----	----	----	----	----
Xylenes, total	1330-20-7	E611D/WT	0.50	µg/L	<0.50	----	----	----	----	----
<b>Volatile Organic Compounds Surrogates</b>										
Bromofluorobenzene, 4-	460-00-4	E611E/WT	1.0	%	88.4	----	----	----	----	----
Bromofluorobenzene, 4-	460-00-4	E611D/WT	1.0	%	88.4	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611E/WT	1.0	%	97.1	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611D/WT	1.0	%	97.1	----	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.




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## QUALITY CONTROL INTERPRETIVE REPORT

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<p><b>Work Order</b> : <b>WT2510693</b></p> <p><b>Client</b> : <b>Pinchin Ltd.</b></p> <p><b>Contact</b> : Deana Bettencourt</p> <p><b>Address</b> : 225 Labrador Drive Unit #1 Waterloo ON Canada N2K 4M8</p> <p><b>Telephone</b> : ----</p> <p><b>Project</b> : WEST PERTH HIBBERT GW</p> <p><b>PO</b> : 333568.002</p> <p><b>C-O-C number</b> : 23-1119736</p> <p><b>Sampler</b> : ML/DH</p> <p><b>Site</b> : ----</p> <p><b>Quote number</b> : West Perth Landfill</p> <p><b>No. of samples received</b> : 1</p> <p><b>No. of samples analysed</b> : 1</p>	<p><b>Page</b> : 1 of 5</p> <p><b>Laboratory</b> : ALS Environmental - Waterloo</p> <p><b>Account Manager</b> : Amanda Overholster</p> <p><b>Address</b> : 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8</p> <p><b>Telephone</b> : 1 416 817 2944</p> <p><b>Date Samples Received</b> : 07-May-2025 16:30</p> <p><b>Issue Date</b> : 12-May-2025 10:32</p>
--	---

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This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

**Key**

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

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### ***Workorder Comments***

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

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### ***Summary of Outliers***

#### ***Outliers : Quality Control Samples***

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

#### ***Outliers: Reference Material (RM) Samples***

- No Reference Material (RM) Sample outliers occur.

### ***Outliers : Analysis Holding Time Compliance (Breaches)***

- No Analysis Holding Time Outliers exist.

### ***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
<b>Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> TRIP BLANK-001	E611D	07-May-2025	09-May-2025	14 days	2 days	✔	09-May-2025	14 days	2 days	✔
<b>Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> TRIP BLANK-001	E611E	07-May-2025	09-May-2025	14 days	2 days	✔	09-May-2025	14 days	2 days	✔

### Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1987992	1	20	5.0	5.0	✔
VOCs (Prairies List) by Headspace GC-MS	E611E	1987991	1	11	9.0	5.0	✔
<b>Laboratory Control Samples (LCS)</b>							
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1987992	1	20	5.0	5.0	✔
VOCs (Prairies List) by Headspace GC-MS	E611E	1987991	1	11	9.0	5.0	✔
<b>Method Blanks (MB)</b>							
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1987992	1	20	5.0	5.0	✔
VOCs (Prairies List) by Headspace GC-MS	E611E	1987991	1	11	9.0	5.0	✔
<b>Matrix Spikes (MS)</b>							
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1987992	1	20	5.0	5.0	✔
VOCs (Prairies List) by Headspace GC-MS	E611E	1987991	1	11	9.0	5.0	✔



## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

<i>Analytical Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
VOCs (Eastern Canada List) by Headspace GC-MS	E611D ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
VOCs (Prairies List) by Headspace GC-MS	E611E ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Waterloo	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into a GC-MS-FID.

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: WT2510693</b>	<b>Page</b>	: 1 of 10
<b>Client</b>	: Pinchin Ltd.	<b>Laboratory</b>	: ALS Environmental - Waterloo
<b>Contact</b>	: Deana Bettencourt	<b>Account Manager</b>	: Amanda Overholster
<b>Address</b>	: 225 Labrador Drive Unit #1 Waterloo ON Canada N2K 4M8	<b>Address</b>	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
<b>Telephone</b>	: ----	<b>Telephone</b>	: 1 416 817 2944
<b>Project</b>	: WEST PERTH HIBBERT GW	<b>Date Samples Received</b>	: 07-May-2025 16:30
<b>PO</b>	: 333568.002	<b>Date Analysis Commenced</b>	: 09-May-2025
<b>C-O-C number</b>	: 23-1119736	<b>Issue Date</b>	: 12-May-2025 10:32
<b>Sampler</b>	: ML/DH		
<b>Site</b>	: ----		
<b>Quote number</b>	: West Perth Landfill		
<b>No. of samples received</b>	: 1		
<b>No. of samples analysed</b>	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
David Tremblett	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario

Page : 2 of 10  
Work Order : WT2510693  
Client : Pinchin Ltd.  
Project : WEST PERTH HIBBERT GW



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## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

# = Indicates a QC result that did not meet the ALS DQO.

## Workorder Comments

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Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

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### Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Volatile Organic Compounds (QC Lot: 1987991)</b>											
WT2510508-001	Anonymous	Trichlorobenzene, 1,2,4-	120-82-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 1987992)</b>											
WT2510508-001	Anonymous	Acetone	67-64-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Benzene	71-43-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Carbon disulfide	75-15-0	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E611D	2.0	µg/L	<2.0	<2.0	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Hexane, n-	110-54-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Volatile Organic Compounds (QC Lot: 1987992) - continued</b>											
WT2510508-001	Anonymous	Hexanone, 2-	591-78-6	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Styrene	100-42-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611D	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----



## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 1987991)</b>						
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	<1.0	---
<b>Volatile Organic Compounds (QCLot: 1987992)</b>						
Acetone	67-64-1	E611D	20	µg/L	<20	---
Benzene	71-43-2	E611D	0.5	µg/L	<0.50	---
Bromodichloromethane	75-27-4	E611D	0.5	µg/L	<0.50	---
Bromoform	75-25-2	E611D	0.5	µg/L	<0.50	---
Bromomethane	74-83-9	E611D	0.5	µg/L	<0.50	---
Carbon disulfide	75-15-0	E611D	1	µg/L	<1.0	---
Carbon tetrachloride	56-23-5	E611D	0.2	µg/L	<0.20	---
Chlorobenzene	108-90-7	E611D	0.5	µg/L	<0.50	---
Chloroethane	75-00-3	E611D	0.5	µg/L	<0.50	---
Chloroform	67-66-3	E611D	0.5	µg/L	<0.50	---
Chloromethane	74-87-3	E611D	2	µg/L	<2.0	---
Dibromochloromethane	124-48-1	E611D	0.5	µg/L	<0.50	---
Dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	<0.20	---
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	<0.50	---
Dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	<0.50	---
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	<0.50	---
Dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	<0.50	---
Dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	<0.50	---
Dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	<0.50	---
Dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	<0.50	---
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	<0.50	---
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	<0.50	---
Dichloromethane	75-09-2	E611D	1	µg/L	<1.0	---
Dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	<0.50	---
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	<0.30	---
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	<0.30	---
Ethylbenzene	100-41-4	E611D	0.5	µg/L	<0.50	---
Hexane, n-	110-54-3	E611D	0.5	µg/L	<0.50	---
Hexanone, 2-	591-78-6	E611D	20	µg/L	<20	---
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 1987992) - continued</b>						
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	<0.50	----
Styrene	100-42-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611D	0.5	µg/L	<0.50	----
Trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	<0.50	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	<0.50	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	<0.50	----
Trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	<0.50	----
Vinyl chloride	75-01-4	E611D	0.2	µg/L	<0.20	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	<0.30	----



## Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
<b>Volatile Organic Compounds (QCLot: 1987991)</b>									
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	100 µg/L	99.7	70.0	130	----
<b>Volatile Organic Compounds (QCLot: 1987992)</b>									
Acetone	67-64-1	E611D	20	µg/L	100 µg/L	114	70.0	130	----
Benzene	71-43-2	E611D	0.5	µg/L	100 µg/L	110	70.0	130	----
Bromodichloromethane	75-27-4	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Bromoform	75-25-2	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Bromomethane	74-83-9	E611D	0.5	µg/L	100 µg/L	90.7	60.0	140	----
Carbon disulfide	75-15-0	E611D	1	µg/L	100 µg/L	109	70.0	130	----
Carbon tetrachloride	56-23-5	E611D	0.2	µg/L	100 µg/L	109	70.0	130	----
Chlorobenzene	108-90-7	E611D	0.5	µg/L	100 µg/L	104	70.0	130	----
Chloroethane	75-00-3	E611D	0.5	µg/L	100 µg/L	113	60.0	140	----
Chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	107	70.0	130	----
Chloromethane	74-87-3	E611D	2	µg/L	100 µg/L	122	60.0	140	----
Dibromochloromethane	124-48-1	E611D	0.5	µg/L	100 µg/L	101	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	100 µg/L	96.2	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	108	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	100 µg/L	111	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	112	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	100 µg/L	124	60.0	140	----
Dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	100 µg/L	101	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	100 µg/L	114	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	100 µg/L	107	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	100 µg/L	111	70.0	130	----
Dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	104	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	100 µg/L	101	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	100 µg/L	96.7	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	100 µg/L	94.4	70.0	130	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	100 µg/L	107	70.0	130	----
Hexane, n-	110-54-3	E611D	0.5	µg/L	100 µg/L	122	70.0	130	----
Hexanone, 2-	591-78-6	E611D	20	µg/L	100 µg/L	71.1	70.0	130	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	100 µg/L	101	70.0	130	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	100 µg/L	77.4	70.0	130	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
<b>Volatile Organic Compounds (QCLot: 1987992) - continued</b>									
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	100 µg/L	105	70.0	130	----
Styrene	100-42-5	E611D	0.5	µg/L	100 µg/L	99.2	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	100 µg/L	97.7	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	100 µg/L	105	70.0	130	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	110	70.0	130	----
Toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	100 µg/L	99.6	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	100 µg/L	97.5	70.0	130	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	110	70.0	130	----
Trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	100 µg/L	112	60.0	140	----
Vinyl chloride	75-01-4	E611D	0.2	µg/L	100 µg/L	120	60.0	140	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	200 µg/L	103	70.0	130	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	100 µg/L	106	70.0	130	----



## Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
<b>Volatile Organic Compounds (QCLot: 1987991)</b>										
WT2510508-001	Anonymous	Trichlorobenzene, 1,2,4-	120-82-1	E611E	98.4 µg/L	100 µg/L	98.4	60.0	140	----
<b>Volatile Organic Compounds (QCLot: 1987992)</b>										
WT2510508-001	Anonymous	Acetone	67-64-1	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Benzene	71-43-2	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Bromodichloromethane	75-27-4	E611D	97.6 µg/L	100 µg/L	97.6	60.0	140	----
		Bromoform	75-25-2	E611D	95.4 µg/L	100 µg/L	95.4	60.0	140	----
		Bromomethane	74-83-9	E611D	79.1 µg/L	100 µg/L	79.1	60.0	140	----
		Carbon disulfide	75-15-0	E611D	95.1 µg/L	100 µg/L	95.1	60.0	140	----
		Carbon tetrachloride	56-23-5	E611D	98.4 µg/L	100 µg/L	98.4	60.0	140	----
		Chlorobenzene	108-90-7	E611D	96.1 µg/L	100 µg/L	96.1	60.0	140	----
		Chloroethane	75-00-3	E611D	100 µg/L	100 µg/L	100	60.0	140	----
		Chloroform	67-66-3	E611D	98.8 µg/L	100 µg/L	98.8	60.0	140	----
		Chloromethane	74-87-3	E611D	103 µg/L	100 µg/L	103	60.0	140	----
		Dibromochloromethane	124-48-1	E611D	91.4 µg/L	100 µg/L	91.4	60.0	140	----
		Dibromoethane, 1,2-	106-93-4	E611D	85.0 µg/L	100 µg/L	85.0	60.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	99.5 µg/L	100 µg/L	99.5	60.0	140	----
		Dichlorobenzene, 1,3-	541-73-1	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		Dichlorodifluoromethane	75-71-8	E611D	99.3 µg/L	100 µg/L	99.3	60.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611D	96.8 µg/L	100 µg/L	96.8	60.0	140	----
		Dichloroethane, 1,2-	107-06-2	E611D	89.1 µg/L	100 µg/L	89.1	60.0	140	----
		Dichloroethylene, 1,1-	75-35-4	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	96.7 µg/L	100 µg/L	96.7	60.0	140	----
		Dichloroethylene, trans-1,2-	156-60-5	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Dichloromethane	75-09-2	E611D	92.8 µg/L	100 µg/L	92.8	60.0	140	----
		Dichloropropane, 1,2-	78-87-5	E611D	91.8 µg/L	100 µg/L	91.8	60.0	140	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	89.6 µg/L	100 µg/L	89.6	60.0	140	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	82.3 µg/L	100 µg/L	82.3	60.0	140	----
		Ethylbenzene	100-41-4	E611D	98.7 µg/L	100 µg/L	98.7	60.0	140	----
		Hexane, n-	110-54-3	E611D	106 µg/L	100 µg/L	106	60.0	140	----
		Hexanone, 2-	591-78-6	E611D	62 µg/L	100 µg/L	61.8	60.0	140	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	92 µg/L	100 µg/L	92.2	60.0	140	----
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	72 µg/L	100 µg/L	72.3	60.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	95.6 µg/L	100 µg/L	95.6	60.0	140	----
		Styrene	100-42-5	E611D	91.1 µg/L	100 µg/L	91.1	60.0	140	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	90.0 µg/L	100 µg/L	90.0	60.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	96.3 µg/L	100 µg/L	96.3	60.0	140	----
		Tetrachloroethylene	127-18-4	E611D	97.3 µg/L	100 µg/L	97.3	60.0	140	----
		Toluene	108-88-3	E611D	92.7 µg/L	100 µg/L	92.7	60.0	140	----

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 Work Order : WT2510693  
 Client : Pinchin Ltd.  
 Project : WEST PERTH HIBBERT GW



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
<b>Volatile Organic Compounds (QCLot: 1987992) - continued</b>										
WT2510508-001	Anonymous	Trichloroethane, 1,1,1-	71-55-6	E611D	91.3 µg/L	100 µg/L	91.3	60.0	140	----
		Trichloroethane, 1,1,2-	79-00-5	E611D	84.6 µg/L	100 µg/L	84.6	60.0	140	----
		Trichloroethylene	79-01-6	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Trichlorofluoromethane	75-69-4	E611D	100 µg/L	100 µg/L	100	60.0	140	----
		Vinyl chloride	75-01-4	E611D	103 µg/L	100 µg/L	103	60.0	140	----
		Xylene, m+p-	179601-23-1	E611D	192 µg/L	200 µg/L	96.2	60.0	140	----
		Xylene, o-	95-47-6	E611D	99.0 µg/L	100 µg/L	99.0	60.0	140	----



**APPENDIX F**  
**Landfill Gas Monitoring Results**

**Table F-1**  
**Landfill Gas Monitoring Results**

**TABLE F-1**  
**LANDFILL GAS MONITORING RESULTS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Well	Top of Screen (masl)	Parameter	Monitoring Date																			
			May-06	May-07	Jun-08	May-09	May-10	May-11	May-12	Apr-13	May-14	May-15	May-16	May-17	May-18	May-19	Apr-20	May-21	May-22	May-23	May-24	May-25
MW1	309.55	Liquid Elevation	<b>308.92</b>	<b>308.87</b>	<b>308.81</b>	<b>308.88</b>	<b>309.27</b>	<b>307.76</b>	<b>308.7</b>	309.56	<b>309.33</b>	<b>309.17</b>	<b>309.13</b>	309.61		<b>309.51</b>	<b>308.978</b>	<b>308.97</b>	<b>309.16</b>	<b>309.12</b>	<b>309.16</b>	<b>309.06</b>
		CH4 (%)	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	0.1	<b>0</b>	<b>0</b>	<b>0</b>	0		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
MW2S	309.26	Liquid Elevation	<b>308.66</b>	<b>308.67</b>	<b>308.67</b>	<b>308.74</b>	<b>309</b>	<b>308.91</b>	<b>308.66</b>	<b>309.15</b>	<b>308.71</b>	<b>308.94</b>	<b>308.89</b>	309.31		<b>309.26</b>	<b>308.72</b>	<b>308.71</b>	<b>308.85</b>	<b>308.82</b>	<b>308.88</b>	<b>308.73</b>
		CH4 (%)	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.1</b>	<b>0</b>	<b>0</b>	<b>0.2</b>	<b>0</b>	<b>0</b>	<b>0</b>	0		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
MW2D	304.76	Liquid Elevation	<b>303.65</b>	307.48	307.5	307.68	307.75	308.08	307.78	308.44	308.11	308.09	307.96	308.17		307.86	307.65	307.74	307.90	307.82	307.81	307.68
		CH4 (%)	<b>0</b>	0	0	0	0	0	0	0.2	0	0	0	0		0	0	0	0	0	0	0
MW3	309.10	Liquid Elevation	309.63	309.64	309.75	309.79	310.23	310.21	309.34	310.42	309.87	309.63	309.69	310.32		310.37	309.68	309.64	309.87	309.83	309.72	<b>306.69</b>
		CH4 (%)	0	0	0	0	0	0	0	0.1	0	0	0	0		0	0	0	0	0	0	0
MW4	309.78	Liquid Elevation	<b>309.54</b>	<b>309.54</b>	<b>309.46</b>	<b>309.62</b>	<b>309.64</b>	<b>308.19</b>	<b>309.52</b>	311.94	311.16	<b>309.62</b>	<b>309.71</b>	310.27		310.16	<b>309.77</b>	310.19	309.86	309.82	309.80	<b>309.67</b>
		CH4 (%)	<b>0</b>	<b>0.2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	0.2	0.07	<b>0</b>	<b>0</b>	0		0	<b>0</b>	0	0	0	0.05	0
MW5S	310.09	Liquid Elevation					<b>309.62</b>	310.86	310.2	310.85	310.51	310.47	310.48	310.98		310.94	310.476	310.53	310.63	310.666	310.66	310.48
		CH4 (%)					<b>0</b>	0	0	0.2	0	0	0	0		0	0	0	0	0	0	0
MW5D	305.59	Liquid Elevation					309.62	309.92	309.31	310.02	310.28	309.44	309.5	310.02		309.96	309.48	309.49	309.67	309.68	309.68	309.56
		CH4 (%)					0.1	0	0	0.2	0	0	0	0		0	0	0	0	0	0	0

- Notes: 1. mASL denotes metres above sea level.  
2. CH<sub>4</sub> denotes methane gas.  
3. Methane gas readings are expressed as percent volume in air from 2006 to 2017 and 2024. Methane gas readings are expressed as percent of the lower explosive limit from 2019 to 2023.  
4. Gas readings are more representative of subsurface conditions when liquid level is within the screened interval.  
5. Bold and shaded denotes that the liquid level is within the screened interval.  
6. Blank denotes data not available.

**Table F-2**  
**Winter Landfill Gas Monitoring Results**

**TABLE F-2**  
**WINTER GAS MONITORING RESULTS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Monitoring Location	Date	Time	Water Level (masl)	CH <sub>4</sub> (%)	% LEL	O <sub>2</sub> (%)	CO (ppm)	H <sub>2</sub> S (ppm)
MW1	2017-01-30	13:02	309.33	0	0	20.9	0	0
MW2S	2017-01-30	12:42	309.04	0	0	20.9	0	0
MW2D	2017-01-30	12:45	308.2	0	0	20.9	0	0
MW3	2017-01-30	12:51	310.28	0	0	20.9	0	0
MW4	2017-01-30	13:10	309.83	0	0	20.9	0	0
MW5S	2017-01-30	12:30	310.77	0	0	20.9	0	0
MW5D	2017-01-30	12:32	309.75	0	0	20.9	0	0
MW1	2017-02-28	16:58	309.4	0	0	20.9	0	0
MW2S	2017-02-28	16:40	309.07	0	0	20.9	0	0
MW2D	2017-02-28	16:42	308.27	0	0	20.9	0	0
MW3	2017-02-28	16:50	310.43	0	0	20.9	0	0
MW4	2017-02-28	17:05	309.95	0	0	20.9	0	0
MW5S	2017-02-28	16:30	310.78	0	0	20.9	0	0
MW5D	2017-02-28	16:32	309.89	0	0	20.9	0	0
MW1	2017-03-28	12:15	309.33	0	0	20.9	0	0
MW2S	2017-03-28	11:58	309.14	0	0	20.9	0	0
MW2D	2017-03-28	12:00	308.31	0	0	20.9	0	0
MW3	2017-03-28	12:10	310.38	0	0	20.9	0	0
MW4	2017-03-28	12:20	310.01	0	0	20.9	0	0
MW5S	2017-03-28	11:45	310.81	0	0	20.9	0	0
MW5D	2017-03-28	11:48	309.91	0	0	20.9	0	0

- Notes: 1) Methane (CH<sub>4</sub>) and Oxygen (O<sub>2</sub>) are expressed as a percent volume in air.  
2) % LEL denotes percent lower explosive limit for methane.  
3) CO denotes carbon monoxide and H<sub>2</sub>S denotes hydrogen sulfide.  
4) ppm denotes parts per million.

**TABLE F-2**  
**WINTER GAS MONITORING RESULTS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Monitoring Location	Date	Time	Water Level (masl)	CH <sub>4</sub> (%)	% LEL	O <sub>2</sub> (%)	CO (ppm)	H <sub>2</sub> S (ppm)
MW1	2020-01-23	10:28	309.23	0	0	20.9	0	0
MW2S	2020-01-23	10:55	308.85	0	0	18.9	0	0
MW2D	2020-01-23	10:45	308.04	0	0	20.9	0	0
MW3	2020-01-23	11:00	310.00	0	0	20.9	0	0
MW4	2020-01-23	10:35	309.99	0	0	20.9	0	0
MW5S	2020-01-23	10:00	310.69	0	0	20.9	0	0
MW5D	2020-01-23	9:50	309.71	0	0	20.9	0	0
MW1	2020-02-23	11:36	309.21	0	0	20.9	0	0
MW2S	2020-02-23	11:55	308.92	0	0	20.9	2	0
MW2D	2020-02-23	12:00	307.74	0	0	20.9	0	0
MW3	2020-02-23	12:12	309.74	0	0	20.9	0	0
MW4	2020-02-23	11:45	309.67	0	0	20.9	0	0
MW5S	2020-02-23	11:20	310.52	0	0	20.9	3	0
MW5D	2020-02-23	11:15	309.63	0	0	20.9	0	0
MW1	2020-03-26	11:15	309.14	0	0	20.9	0	0
MW2S	2020-03-26	11:35	308.81	0	0	20.9	1	0
MW2D	2020-03-26	11:30	307.92	0	0	20.9	1	0
MW3	2020-03-26	11:40	309.99	0	0	20.9	0	0
MW4	2020-03-26	11:20	309.96	0	0	20.9	0	0
MW5S	2020-03-26	11:05	310.70	0	0	20.9	3	0
MW5D	2020-03-26	11:00	309.69	0	0	20.9	0	0

- Notes: 1) Methane (CH<sub>4</sub>) and Oxygen (O<sub>2</sub>) are expressed as a percent volume in air.  
2) % LEL denotes percent lower explosive limit for methane.  
3) CO denotes carbon monoxide and H<sub>2</sub>S denotes hydrogen sulfide.  
4) ppm denotes parts per million.

**TABLE F-2**  
**WINTER GAS MONITORING RESULTS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Monitoring Location	Date	Time	Water Level (masl)	Water Level (mbgs)	CH <sub>4</sub> (%)	% LEL	O <sub>2</sub> (%)	CO (ppm)	H <sub>2</sub> S (ppm)
MW1	2021-01-28	10:45	309.33	3.62	0	0	20.9	0	0
MW2S	2021-01-28	10:55	309.10	2.41	0	0	20.9	0	0
MW2D	2021-01-28	10:58	308.06	3.43	0	0	20.9	0	0
MW3	2021-01-28	11:00	309.76	1.58	0	0	20.9	0	0
MW4	2021-01-28	10:51	309.76	3.81	0	0	20.9	0	0
MW5S	2021-01-28	10:27	Monitoring well was frozen. Unable to monitor.						
MW5D	2021-01-28	10:35	Monitoring well was frozen. Unable to monitor.						
MW1	2021-02-25	14:30	309.44	3.51	0	0	20.9	0	0
MW2S	2021-02-25	14:42	309.15	2.36	0	0	20.9	0	0
MW2D	2021-02-25	14:47	308.03	3.46	0	0	20.9	0	0
MW3	2021-02-25	15:00	0.05	1.51	0	0	20.9	0	0
MW4	2021-02-25	14:35	309.61	3.96	0	0	20.9	0	0
MW5S	2021-02-25	14:00	310.55	1.90	0	0	20.9	0	0
MW5D	2021-02-25	14:10	309.54	3.05	0	0	20.9	0	0
MW1	2021-03-23	11:39	309.14	3.82	0	0	20.9	0	0
MW2S	2021-03-23	11:50	308.75	2.76	0	0	20.9	0	0
MW2D	2021-03-23	11:53	308.00	3.50	0	0	20.9	0	0
MW3	2021-03-23	12:00	309.91	1.43	0	0	20.9	0	0
MW4	2021-03-23	11:45	309.92	3.65	0	0	20.9	0	0
MW5S	2021-03-23	11:30	310.67	1.77	0	0	20.9	0	0
MW5D	2021-03-23	11:35	309.65	2.95	0	0	20.9	0	0

- Notes: 1) Methane (CH<sub>4</sub>) and Oxygen (O<sub>2</sub>) are expressed as a percent volume in air.  
2) % LEL denotes percent lower explosive limit for methane.  
3) CO denotes carbon monoxide and H<sub>2</sub>S denotes hydrogen sulfide.  
4) ppm denotes parts per million.

**TABLE F-2**  
**WINTER GAS MONITORING RESULTS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Monitoring Location	Date	Time	Water Level (masl)	CH <sub>4</sub> (%)	% LEL	O <sub>2</sub> (%)	CO (ppm)	H <sub>2</sub> S (ppm)	
MW1	2022-01-20	9:45	309.11	0	0	20.9	0	0	
MW2S	2022-01-20	10:05	308.88	0	0	20.9	0	0	
MW2D	2022-01-20	10:10	307.91	0	0	20.9	0	0	
MW3	2022-01-20	10:15	309.72	0	0	20.9	0	0	
MW4	2022-01-20	10:00	309.63	0	0	20.9	0	0	
MW5S	2022-01-20	9:10	310.46	0	0	20.9	0	0	
MW5D	2022-01-20	9:20	309.47	0	0	20.9	0	0	
MW1	2022-02-28	11:25	309.35	0	0	20.9	0	0	
MW2S	2022-02-28	11:35	308.91	0	0	20.9	0	0	
MW2D	2022-02-28	11:40	Monitoring well was frozen. Unable to monitor.						
MW3	2022-02-28	11:55	310.15	0	0	20.9	0	0	
MW4	2022-02-28	11:30	310.09	0	0	20.9	0	0	
MW5S	2022-02-28	11:10	310.78	0	0	20.9	0	0	
MW5D	2022-02-28	11:05	309.67	0	0	20.9	0	0	
MW1	2022-03-24	12:45	309.92	0	0	20.9	0	0	
MW2S	2022-03-24	13:00	309.64	0	0	20.9	0	0	
MW2D	2022-03-24	13:05	308.09	0	0	20.9	0	0	
MW3	2022-03-24	13:15	310.60	0	0	20.9	0	0	
MW4	2022-03-24	12:50	310.31	0	0	20.9	0	0	
MW5S	2022-03-24	12:30	311.37	0	0	20.9	0	0	
MW5D	2022-03-24	12:35	309.56	0	0	20.9	0	0	

- Notes: 1) Methane (CH<sub>4</sub>) and Oxygen (O<sub>2</sub>) are expressed as a percent volume in air.  
2) % LEL denotes percent lower explosive limit for methane.  
3) CO denotes carbon monoxide and H<sub>2</sub>S denotes hydrogen sulfide.  
4) ppm denotes parts per million.

**TABLE F-2**  
**WINTER GAS MONITORING RESULTS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Monitoring Location	Date	Time	Water Level (masl)	CH <sub>4</sub> (%)	% LEL	O <sub>2</sub> (%)	CO (ppm)	H <sub>2</sub> S (ppm)
MW1	2023-01-23	10:50	309.24	0	0	20.9	0	0
MW2S	2023-01-23	11:00	308.89	0	0	20.9	0	0
MW2D	2023-01-23	11:10	308.11	0	0	20.9	0	0
MW3	2023-01-23	11:20	309.95	0	0	21.1	0	0
MW4	2023-01-23	11:30	309.96	0	0	21.1	0	0
MW5S	2023-01-23	11:40	310.67	0	0	21.2	0	0
MW5D	2023-01-23	11:50	309.73	0	0	21.2	0	0
MW1	2023-02-21	14:30	309.37	0	0	20.9	0	0
MW2S	2023-02-21	14:40	308.97	0	0	20.9	0	0
MW2D	2023-02-21	14:50	308.15	0	0	20.9	0	0
MW3	2023-02-21	15:00	310.18	0	0	20.9	0	0
MW4	2023-02-21	15:10	310.13	0	0	20.9	0	0
MW5S	2023-02-21	15:20	311.01	0	0	20.9	0	0
MW5D	2023-02-21	15:30	309.86	0	0	20.9	0	0
MW1	2023-03-20	12:45	309.53	0	0	20.9	0	0
MW2S	2023-03-20	12:55	309.05	0	0	20.9	0	0
MW2D	2023-03-20	13:05	308.02	0	0	20.9	0	0
MW3	2023-03-20	13:15	310.36	0	0	21.1	0	0
MW4	2023-03-20	13:25	310.20	0	0	21.1	0	0
MW5S	2023-03-20	13:35	311.18	0	0	21.1	0	0
MW5D	2023-03-20	13:45	309.97	0	0	21.1	0	0

- Notes: 1) Methane (CH<sub>4</sub>) and Oxygen (O<sub>2</sub>) are expressed as a percent volume in air.  
2) % LEL denotes percent lower explosive limit for methane.  
3) CO denotes carbon monoxide and H<sub>2</sub>S denotes hydrogen sulfide.  
4) ppm denotes parts per million.

**TABLE F-2**  
**WINTER GAS MONITORING RESULTS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Monitoring Location	Date	Time	Measuring Point Elevation (masl)	Depth to Water (mbtoc)	Water Level (masl)	CH <sub>4</sub> (%)	% LEL	O <sub>2</sub> (%)	CO (ppm)	H <sub>2</sub> S (ppm)
MW1	23-02-2024	10:05	312.95	3.61	309.34	0	0	20.9	0	0
MW2S	23-02-2024	10:25	311.51	2.45	309.06	0	0	20.9	0	0
MW2D	23-02-2024	10:20	311.49	3.58	307.91	0	0	20.9	0	0
MW3	23-02-2024	10:35	311.34	1.30	310.04	0	0	20.9	0	0
MW4	23-02-2024	10:15	313.57	3.63	309.94	0	0	20.9	0	0
MW5S	23-02-2024	9:55	312.45	1.49	310.96	0	0	20.9	0	0
MW5D	23-02-2024	9:50	312.59	2.74	309.85	0	0	20.9	0	0
MW1	18-03-2024	12:15	312.95	3.42	309.53	0	0	20.9	0	0
MW2S	18-03-2024	12:35	311.51	2.33	309.18	0	0	20.7	0	0
MW2D	18-03-2024	12:40	311.49	3.54	307.95	0	0	20.9	0	0
MW3	18-03-2024	12:45	311.34	1.11	310.23	0	0	20.9	0	0
MW4	18-03-2024	12:25	313.57	3.48	310.09	0	0	20.9	0	0
MW5S	18-03-2024	12:00	312.45	1.32	311.13	0	0	20.9	0	0
MW5D	18-03-2024	12:05	312.59	2.52	310.07	0	0	20.9	0	0
MW1	30-12-2024	10:50	312.95	2.74	310.21	0	0	20.8	0	0
MW2S	30-12-2024	11:15	311.51	1.43	310.08	0	0	20.9	0	0
MW2D	30-12-2024	11:10	311.49	3.52	307.97	0	0	20.9	0	0
MW3	30-12-2024	11:30	311.34	0.69	310.65	0	0	20.9	0	0
MW4	30-12-2024	11:00	313.57	3.45	310.12	0	0	20.9	0	0
MW5S	30-12-2024	10:35	312.45	0.99	311.46	0	1	20.3	0	0
MW5D	30-12-2024	10:30	312.59	1.93	310.66	0	1	20.2	0	0

- Notes: 1) Methane (CH<sub>4</sub>) and Oxygen (O<sub>2</sub>) are expressed as a percent volume in air.  
2) % LEL denotes percent lower explosive limit for methane.  
3) CO denotes carbon monoxide and H<sub>2</sub>S denotes hydrogen sulfide.  
4) ppm denotes parts per million.

**TABLE F-2**  
**WINTER GAS MONITORING RESULTS**  
**Hibbert Landfill**  
**County Road 24, Municipality of West Perth**

Monitoring Location	Date	Time	Measuring Point Elevation (masl)	Depth to Water (mbtoc)	Water Level (masl)	CH <sub>4</sub> (%)	% LEL	O <sub>2</sub> (%)	CO (ppm)	H <sub>2</sub> S (ppm)		
MW1	23-01-2025	11:45	312.95	3.87	309.08	0	0	21.1	0	0		
MW2S	23-01-2025	12:15	311.51	2.70	308.81	0	0	20.6	0	0		
MW2D	23-01-2025	12:10	311.49	Monitoring well was frozen. Unable to monitor.								
MW3	23-01-2025	12:30	311.34	1.52	309.82	0	0	20.9	0	0		
MW4	23-01-2025	12:00	313.57	3.81	309.76	0	0	20.9	0	0		
MW5S	23-01-2025	11:10	312.45	1.77	310.68	0	0	21.1	0	0		
MW5D	23-01-2025	11:00	312.59	1.80	310.79	0	0	20.9	0	0		
MW1	26-02-2025	12:15	312.95	3.55	309.40	0	0	20.9	0	0		
MW2S	26-02-2025	12:40	311.51	2.31	309.20	0	0	20.3	0	0		
MW2D	26-02-2025	12:35	311.49	3.60	307.89	0	0	20.9	0	0		
MW3	26-02-2025	12:55	311.34	1.64	309.70	0	0	20.5	0	0		
MW4	26-02-2025	12:20	313.57	4.01	309.56	0	0	20.9	0	0		
MW5S	26-02-2025	11:40	312.45	1.82	310.63	0	0	20.9	0	0		
MW5D	26-02-2025	11:30	312.59	2.91	309.68	0	0	20.9	0	0		
MW1	13-03-2025	13:45	312.95	3.28	309.67	0	0	20.9	0	0		
MW2S	13-03-2025	14:10	311.51	2.28	309.23	0	0	20.8	0	0		
MW2D	13-03-2025	14:05	311.49	3.30	308.19	0	0	20.9	0	0		
MW3	13-03-2025	14:20	311.34	0.82	310.52	0	0	20.9	0	0		
MW4	13-03-2025	13:55	313.57	3.23	310.34	0	0	20.9	0	0		
MW5S	13-03-2025	13:30	312.45	1.22	311.23	0	0	20.9	0	0		
MW5D	13-03-2025	13:20	312.59	2.49	310.10	0	0	20.9	0	0		

- Notes: 1) Methane (CH<sub>4</sub>) and Oxygen (O<sub>2</sub>) are expressed as a percent volume in air.  
2) % LEL denotes percent lower explosive limit for methane.  
3) CO denotes carbon monoxide and H<sub>2</sub>S denotes hydrogen sulfide.  
4) ppm denotes parts per million.

**APPENDIX G**  
**Annual Site Inspection Record**

# Landfill Site Inspection Form

Site: Hibbert

Project Number: 333568.002

Client: Municipality of West Perth

Date: May 7, 2025

Type of Inspection: Annual

Time: 8:30

Weather Conditions: Cloudy

Inspector(s): ML/DH

Inspection Item	Y	N	Comments:
Signage at the Site entrance is present, in good condition, and visible from the roadway in front of the Site.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Entrance gate for the Site is functional, and, when appropriate, closed and locked.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Fencing and other control measures, where appropriate, are competent.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>fence cut beside gate</u>
Cover material on the waste mound, where applicable, is adequate.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
No general settlement areas or depressions on or adjacent to the waste mound.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
No presence of ponded water on or adjacent to the waste mound.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
No evidence of erosion, shear and tension cracks, or other compromises in the waste mound cover.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
No evidence of leachate seepage on or adjacent to the waste mound.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
No evidence of vegetative stress on or adjacent to the waste mound.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
No vermin, rodents, or scavenging animals observed at the Site.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
No evidence of vermin, etc. (e.g., burrows, tracks) observed on or adjacent to the waste mound.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surface water drainage works and SWM Ponds, where applicable, are competent.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Monitoring installations for the Site are competent and, where applicable, locked.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Site is generally clear of litter.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Comments

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**APPENDIX H**  
**MECP Monitoring and Screening Checklist**

## Appendix D-Monitoring and Screening Checklist

### General Information and Instructions

**General Information: The checklist is to be completed, and submitted with the Monitoring Report.**

**Instructions:** A complete checklist consists of:

- (a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
- (b) completed contact information for the Competent Environmental Practitioner (CEP)
- (c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

**Definition of Groundwater CEP:**

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

- (a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
- (b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

**Definition of Surface water CEP:**

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

### Monitoring Report and Site Information

<b>Monitoring Report and Site Information</b>	
<b>Waste Disposal Site Name</b>	
<b>Location (e.g. street address, lot, concession)</b>	
<b>GPS Location (taken within the property boundary at front gate/ front entry)</b>	
<b>Municipality</b>	
<b>Client and/or Site Owner</b>	
<b>Monitoring Period (Year)</b>	
This Monitoring Report is being submitted under the following:	
<b>Certificate of Approval No.:</b>	
<b>Director's Order No.:</b>	
<b>Provincial Officer's Order No.:</b>	
<b>Other:</b>	

<b>Report Submission Frequency</b>	<input type="radio"/> <b>Annual</b> <input type="radio"/> <b>Other</b>	
<b>The site is:</b>	<input type="radio"/> <b>Active</b> <input type="radio"/> <b>Inactive</b> <input type="radio"/> <b>Closed</b>	
<b>If closed, specify C of A, control or authorizing document closure date:</b>		
<b>Has the nature of the operations at the site changed during this monitoring period?</b>	<input type="radio"/> <b>Yes</b> <input type="radio"/> <b>No</b>	
<b>If yes, provide details:</b>		
<b>Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i. e. exceeded the LEL for methane)</b>	<input type="radio"/> <b>Yes</b> <input type="radio"/> <b>No</b>	

## Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

### Sampling and Monitoring Program Status:

<p>1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:</p>	<p><input type="radio"/> Yes <input type="radio"/> No</p>	
<p>2) All groundwater, leachate and WDS gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by Certificate(s) of Approval or other relevant authorizing/control document(s):</p>	<p><input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Applicable</p>	<p>If no, list exceptions below or attach information.</p>

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

<p>3) a) Some or all groundwater, leachate and WDS gas sampling and monitoring requirements have been established or defined outside of a ministry C of A, authorizing, or control document.</p>	<p><input type="radio"/> Yes  <input type="radio"/> No  <input type="radio"/> Not Applicable</p>	
<p>b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:</p>	<p><input type="radio"/> Yes  <input type="radio"/> No  <input type="radio"/> Not Applicable</p>	<p>If no, list exceptions below or attach additional information.</p>
<p><b>Groundwater Sampling Location</b></p>	<p><b>Description/Explanation for change (change in name or location, additions, deletions)</b></p>	<p><b>Date</b></p>
<p>4) All field work for groundwater investigations was done in accordance with standard operating procedures as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):</p>	<p><input type="radio"/> Yes  <input type="radio"/> No</p>	

## Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<p>5) The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.</p>	<p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p>	
<p>6) The site meets compliance and assessment criteria.</p>	<p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p>	
<p>7) The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.</p>	<p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p>	
<p>1) Is one or more of the following risk reduction practices in place at the site:</p> <p>(a) There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/treatment; or</p> <p>(b) There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or</p> <p>(c) The site meets the following two conditions (typically achieved after 15 years or longer of site operation):</p> <p><i>i.</i> The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and</p> <p><i>ii.</i> Seasonal and annual water levels and water quality fluctuations are well understood.</p>	<p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>Note which practice(s):</p> <p><input type="checkbox"/> (a)</p> <p><input type="checkbox"/> (b)</p> <p><input type="checkbox"/> (c)</p>
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	

## Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

## Recommendations:

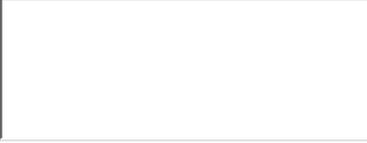
Based on my technical review of the monitoring results for the waste disposal site:

No changes to the monitoring program are recommended

The following change(s) to the monitoring program is/are recommended:

No Changes to site design and operation are recommended

The following change(s) to the site design and operation is/are recommended:

<b>Name:</b>			
<b>Seal:</b>	Add Image		
<b>Signature:</b>		<b>Date:</b>	
<b>CEP Contact Information:</b>			
<b>Company:</b>			
<b>Address:</b>			
<b>Telephone No.:</b>		Fax No. :	
<b>E-mail Address:</b>			
<b>Co-signers for additional expertise provided:</b>			
<b>Signature:</b>		<b>Date:</b>	
<b>Signature:</b>		<b>Date:</b>	

## Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):

<b>Name (s)</b>	
<b>Distance(s)</b>	

Based on all available information and site knowledge, it is my opinion that:

### Sampling and Monitoring Program Status:

<b>1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:</b>	<input type="radio"/> Yes  <input type="radio"/> No	
<b>2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the Certificate(s) of Approval or relevant authorizing/control document(s) (if applicable):</b>	<input type="radio"/> Yes <input type="radio"/> No  <input type="radio"/> <b>Not applicable (No C of A, authorizing / control document applies)</b>	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

<p>3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry C of A or authorizing/control document.</p>	<p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	
<p>b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:</p>	<p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>If no, specify below or provide details in an attachment.</p>
Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
<p>4) All field work for surface water investigations was done in accordance with standard operating procedures, including internal/external QA/QC requirements, as established/ outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):</p>	<p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p>	

## Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):

Yes

No

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table below or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. C of A limit, PWQO, background	e.g. X% above PWQO

6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?

Yes

No

<p>7) <b>All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.</b></p>	<p><input type="radio"/> <b>Yes</b></p> <p><input type="radio"/> <b>No</b></p>	
<p>8) <b>For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g., PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):</b></p>	<p><input type="radio"/> <b>Yes</b></p> <p><input type="radio"/> <b>No</b></p> <p><input type="radio"/> <b>Not Known</b></p> <p><input type="radio"/> <b>Not Applicable</b></p>	
<p>9) <b>Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</b></p>	<p><input type="radio"/> <b>Yes</b></p> <p><input type="radio"/> <b>No</b></p> <p><input type="radio"/> <b>Not Applicable</b></p>	

## Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended) and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

## Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

<p><input type="radio"/> No Changes to the monitoring program are recommended</p> <p><input type="radio"/> The following change(s) to the monitoring program is/are recommended:</p>	
<p><input type="radio"/> No changes to the site design and operation are recommended</p> <p><input type="radio"/> The following change(s) to the site design and operation is/are recommended:</p>	

<b>CEP Signature</b>		
<b>Relevant Discipline</b>		
<b>Date:</b>		
<b>CEP Contact Information:</b>		
<b>Company:</b>		
<b>Address:</b>		
<b>Telephone No.:</b>		
<b>Fax No. :</b>		
<b>E-mail Address:</b>		